McKay Point Reservoir Project



DRAFT ENVIRONMENTAL IMPACT REPORT

SCH# 2014011078

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ES.0 EXECUTIVE SUMMARY

ES.1 PROJECT UNDER REVIEW

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California. This area is commonly referred to as the McKay Point property. The Owners propose to construct and operate a surface water storage and re-regulation reservoir, the McKay Point Reservoir, on the property. The construction and operation of this reservoir is the Project under review.

TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah and St. Johns River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code.

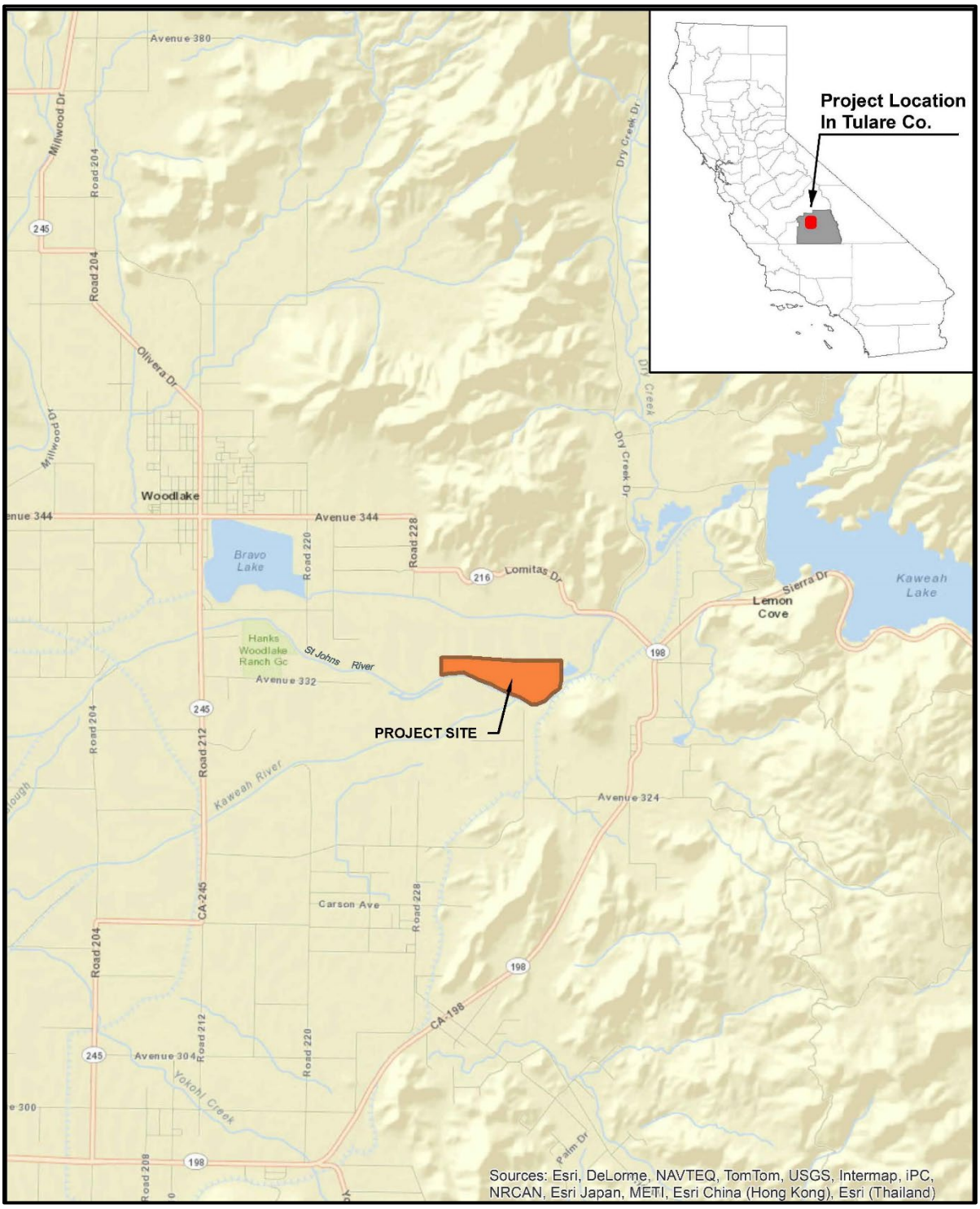
Implementation of the Project requires discretionary approvals from TID for the construction and operation of the reservoir and from the Tulare County (County), under the California Surface Mining and Reclamation Act (SMARA), for the excavation of approximately 110 acres needed to create the reservoir. TID is the lead agency for the purposes of administering the requirements of the California Environmental Quality Act (CEQA) and for preparing this Draft Environmental Impact Report (DEIR). TID is also the Project applicant on behalf of the Owners.

ES.1.1 Project Summary

The Project is located between and south of Lake Kaweah/Terminus Hydropower Plant (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site), approximately 1.0 mile northwest of the community of Lemon Cove and 2.5 miles southeast of the community of Woodlake (Figure ES-1 – Location Map). The Project area has historically been and continues to be used for agriculture, cattle grazing, and aggregate mining as shown in Figure ES-2 – Project Site and Surrounding Land Use.

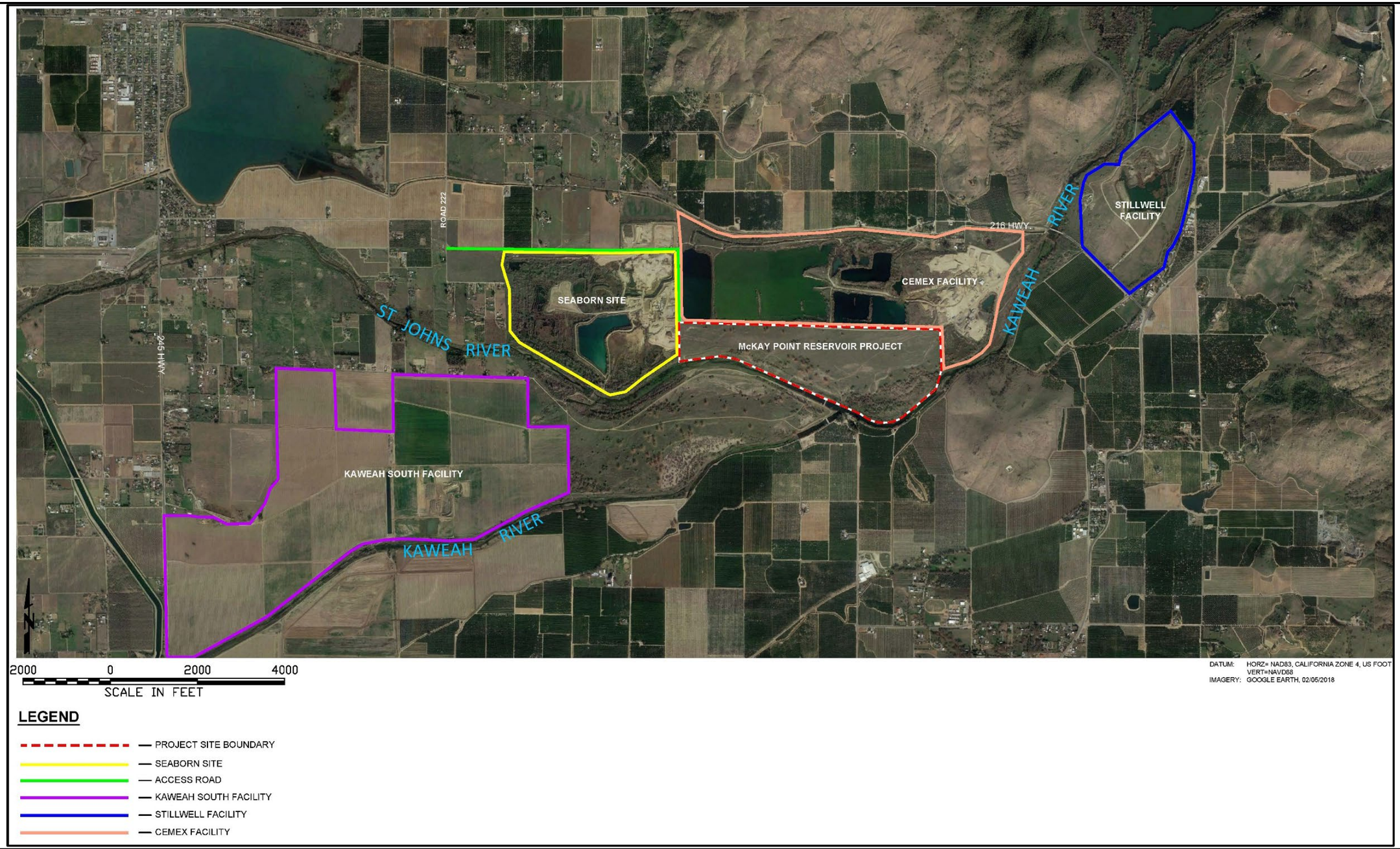
The Project is the construction and operation of a surface water storage reservoir (reservoir). The reservoir would allow for better management of surface water by providing 4,600 acre-feet of water storage capacity to support water demands during dry seasons, additional flood control and storm water management during the wet season.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and, operation of the reservoir. The Owners intend to enter into a lease agreement with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage/re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.



Source: Provost & Pritchard Consulting Group (October 2013)

Figure ES-1 Location Map



Source: Sespe Consulting, Inc. (October 2020)

Figure ES-2 Project Site and Surrounding Land Uses

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ES.1.2 Project Objectives and Benefits

The Owners' objectives in proposing the Project include:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water right interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet as part of the proposed Project.
- Deliver water to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Water Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCSG to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

Once the reservoir is constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.

ES.2 CEQA PROCESS

CEQA is a California statute passed in 1970 to institute a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires State and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts.

The CEQA Guidelines are State regulations that were developed to explain and interpret the law for both the public agencies required to administer CEQA and for the public generally. The CEQA Guidelines provide objectives, criteria and procedures for the orderly evaluation of projects and the preparation of environmental documents. The fundamental purpose of the Guidelines is to make the CEQA process comprehensible to those who administer it, to those subject to it, and to those for whose benefit it exists. To that end, the Guidelines are more than mere regulations which implement CEQA, as they incorporate and interpret both the statutory mandates of CEQA and the principles advanced by judicial decisions.

In general, the CEQA process for an EIR involves the following steps:

- Lead Agency preparation of an Initial Study and/or determination for the need of an EIR;
- Notice of Preparation (NOP);
- Scoping process;
- Preparation of a DEIR;
- Notice of Completion (NOC), DEIR public and agency review process;
- Response to comments;
- Preparation of Final EIR (FEIR); and
- Notice of Determination (NOD).

The involvement of the public during the CEQA process is an integral part of the environmental analysis. Public involvement helps to refine the proposed action, identify issues, explore possible alternatives and identify interested and affected persons. The sections below describe the activities taken to ensure that the public has been, and will be appropriately involved in this process.

ES.2.1 Lead Agencies

ES.2.1.1 CEQA Lead Agency

TID is the Project Lead Agency as defined in Section 15051(a) of the Guidelines for implementing CEQA (CEQA Guidelines), which states: "*If the project will be carried out by a public agency, that agency shall be the Lead Agency even if the project would be located within the jurisdiction of another public agency*."

ES.2.1.2 SMARA Lead Agency

The excavation portion of the Project is considered "surface mining" by the County, which is subject to the requirements of SMARA. The County is the Lead Agency for purposes of administering the SMARA requirements. As such, the County is responsible for the review and approval of a Surface Mining Permit, a SMARA-compliant Reclamation Plan, and a Financial Assurance Cost Estimate (FACE) (Pub. Res. Code § 2770(a)). The County is required to submit the Reclamation Plan and FACE to the Department of Conservation (DOC), Division of Mine Reclamation (DMR) for review and comment prior to approving these documents.

ES.2.2 Responsible and Trustee Agencies

A Responsible Agency under CEQA is a public agency, other than the Lead Agency, which has permitting authority or approval power over some aspect of the overall Project (CEQA Guidelines Section 15381). The Responsible Agencies for this Project are: Tulare County; the Army Corps of Engineers (Army Corp); California Department of Fish and Wildlife (CDFW); Department of Conservation (DOC), Division of Mine Reclamation (DMR); California Central Valley Regional Water Quality Control Board (RWQCB); the U.S. Fish and Wildlife Service (USFWS); and San Joaquin Valley Unified Air Pollution Control District (SJVAPCD).

A Trustee Agency is "a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California" (CEQA Guidelines Section 15386). The Trustee Agencies for the Project are: the CDFW, USFWS, US Army Corp, DOC and DMR, and CVRWQCB are potential Trustee Agencies for this Project.

ES.2.3 Initial Study, Notice of Preparation and Scoping Process

In accordance with CEQA Guidelines Section 15063, an Initial Study should be conducted to determine if a proposed project may have a significant effect on the environment. If the CEQA Lead Agency can determine that an EIR will clearly be required for a proposed project, an Initial Study is not required. TID, acting in its capacity as Lead Agency, determined an EIR would be required for this Project; therefore, an Initial Study was not prepared.

After deciding that an EIR is required for a project, the Lead Agency shall send to the Office of Planning and Research (OPR) and each responsible and trustee agency a Notice of Preparation (NOP) stating that an EIR will be prepared.

The public scoping process provides a mechanism for focusing and clarifying the issues to be addressed in the DEIR, by actively obtaining input from the public and interested federal, state, tribal, and local

agencies. Information received during the scoping assists the Lead Agency in identifying potential environmental issues, impacts, project alternatives, and mitigation measures associated with the Project.

TID submitted the NOP for this Project to OPR on October 2, 2020. The scoping period ended on November 4, 2020. The State Clearinghouse assigned the Project the following identification number: 2014011078. The NOP was made available on the TID website at: https://tulareid.org/engineering-capital-projects or www.mckaypoint.com. The notice was also posted in the outside noticing box located in front of the Tulare Irrigation District office at the following address: 6826 Avenue 240 – Tulare, CA 93274. A copy of the NOP is in Appendix A of this DEIR.

TID held two scoping meetings to receive comments on the proposed Project and potential environmental impacts. In accordance with the Governor's Executive Order (N-29-20) and the declared State of Emergency, including social distancing directives as a result of the COVID-19 virus, this Scoping Meeting was held remotely. There was not a physical location for this meeting. The public scoping meetings were held remotely via WebEX on October 15, 2020 at 5:30 p.m. and October 16, 2020 at 9:00 a.m.

Written comments were received during the scoping period. Copies of these letters and emails, the list of those who provided comments and a copy of the presentations provided during the meeting are located in the Scoping Report (Appendix A) of this DEIR.

Table ES-1 provides a brief summary of the areas of concern received during the scoping process and where they are addressed in the DEIR. In order to fully identify the issues raised, copies of the letters/emails are provided in the Scoping Report (Appendix A of this DEIR). These comments will be incorporated into the EIR Administrative Record for the Project and are addressed in this DEIR, as appropriate.

Table ES-1 Issues Raised During Scoping Period

Area of Concern	DEIR Section
Reclamation Plan.	Section 2.0 – Project Description
Potential impacts to real estate and quality of life.	The purpose of CEQA is for environmental impact evaluation.
Permit requirements, specifically Central Valley Flood Protection Board encroachment permit and US Army Corp of Engineers Section 10 and 404 permits.	Section 1.0 - Introduction Section 3.7 – Hydrology and Water Quality Section 3.2 – Biological Resources
Details of the mining operations.	Section 2.0 – Project Description
Drought conditions and water supply.	Section 3.7 – Hydrology and Water Quality
Impacts to local groundwater wells.	Section 3.7 – Hydrology and Water Quality

ES.2.4 Notice of Completion and DEIR Review Process

The Notice of Availability (NOA)/Notice of Completion (NOC) was filed on March 1, 2024, and distributed to public agencies, other affected agencies, adjacent cities, and counties, members of the public, and any

parties who have submitted a written request for a copy of the DEIR. It was also posted in the Visalia Times-Delta newspaper on March 1, 2024, and on the outside noticing box located in front of the Tulare Irrigation District office at the following address: 6826 Avenue 240 – Tulare, California 93274. A copy of the NOA/NOC is provided in Appendix A of this DEIR. The 45-day public review period for the DEIR started on March 1, 2024, and a copy of the DEIR is available for public review on the TID webpage: http://www.tulareid.org.

Written comments on the DEIR must be mailed or emailed to the following TID contact no later than April 15, 2024:

Graham Stephens
Sespe Consulting, Inc.
374 Poli Street, Suite 200
Ventura, California 93003
Phone: (805) 275-1515
Email: gstephens@sespe.com

ES.2.5 Response to Comments, Final EIR, Certification, Findings and Notice of Determination

Following the close of the public review period, written comments on a project will be compiled and responses will be generated in conjunction with the preparation of the Final EIR (FEIR). The FEIR will consist of a list of all persons, organizations, and public agencies commenting on the DEIR; copies of the comments received on the DEIR; responses to comments; and any other pertinent information added by the lead agency. Prior to approving a project, the Lead Agency shall certify that the FEIR has been completed in compliance with CEQA and that it reflects the agency's independent judgment and analysis.

The Lead Agency shall file a Notice of Determination (NOD), and the FEIR will serve as the CEQA compliance document for the decision-making agency (in this case TID) and any other agencies that may be responsible for review of a project and issuance of required permits and approvals.

ES.2.6 Mitigation Monitoring and Reporting

CEQA requires adoption of a reporting and monitoring program referred to as the Mitigation Monitoring and Reporting Program (MMRP) for those measures or conditions placed on a project to mitigate or avoid adverse effects on the environment. A final MMRP shall be adopted for this Project by TID upon certification of the FEIR.

ES.3 SUMMARY OF ENVIRONMENTAL IMPACTS

The following environmental issues have been identified as areas where the Project could result in a potentially significant impact and were therefore evaluated in the DEIR. The DEIR section number of each is identified in parentheses.

- Air Quality (3.3)
- Biological Resources (3.4)
- Cultural Resources (3.5)
- Hydrology and Water Quality (3.10)
- Land Use and Planning (3.11)
- Noise (3.13)

- Geology and Soils (3.7)
- Greenhouse Gases Emissions (3.8)
- Hazards and Hazardous Materials (3.9)
- Tribal Cultural Resources (3.18)
- Wildfire (3.20)

Based on the CEQA Guidelines thresholds of significance, the following environmental resources areas were determined not to be significantly affected by the implementation of the Project; therefore, these resource areas do not require further detailed analysis in this DEIR (Guidelines Section 15128). Nonetheless, these environmental resources are discussed within the following DEIR sections:

- Aesthetics (3.1);
- Agriculture and Forestry Resources (3.2);
- Energy (3.6);
- Mineral Resources (3.12);
- Population and Housing (3.14);
- Public Services (3.15);
- Recreation (3.16);
- Transportation (3.17); and
- Utilities/Service Systems (3.19).

Each chapter of this DEIR describes the threshold criteria used to evaluate potentially significant effects of the Project (the threshold of significance), the mitigation measures proposed to reduce or eliminate impacts found to be potentially significant, and an evaluation of the subsequent significance level of the impact after mitigation measures have been implemented. Table ES-2 provides a summary of the potentially significant impacts, applicable mitigation measures, and the level of significance after mitigation.

ES.4 SUMMARY OF ENVIRONMENTAL IMPACTS ANALYSIS

The following summarizes information presented in detail in Chapter 3.0 – Environmental Impact Analysis.

ES.4.1 Findings of No Impact or Less than Significant Impacts

After evaluation in the DEIR, it has been determined the Project would have No Impacts or Less than Significant Impacts in the following areas:

- Aesthetics;
- Agriculture and Forestry Resources;
- Energy;
- Geology and Soils;
- Greenhouse Gases;
- Hazards and Hazardous Materials;
- Hydrology and Water Quality;
- Land Use and Planning;
- Mineral Resources;

- Population and Housing;
- Public Services;
- Recreation;
- Transportation;
- Tribal Cultural Resources;
- Utilities and Services; and
- Wildfire.

ES.4.2 Findings of Less than Significant Impacts after Mitigation Measures Have Been Implemented

After a detailed evaluation in the DEIR, it has been determined the Project would have, after the implementation of mitigation measures, a less than significant impacts in the following areas:

- Air Quality;
- Biological Resources;
- Cultural Resources;
- Geology and Soils; and
- Noise.

ES.4.2 Findings of Significant Impacts after Mitigation Measures Have Been Implemented

It was determined that all potentially significant impacts caused by the Project can be mitigated to levels considered less than significant upon implementation of the mitigation measures summarized in Table ES-2 and described in more detail throughout Section 3.0.

ES.4.4 Findings of Cumulative Impacts

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and probable future projects within the vicinity of the proposed project. Cumulative projects consisting of approved, pending, and recorded projects in the vicinity of the Project were obtained from the Tulare County's and City of Woodlake's websites. In addition, the existing and recently approved mining projects in the immediate vicinity of the Project were considered in the cumulative analysis. The cumulative impacts are discussed for each of the resource topics evaluated in Sections 3.0 and 5.0, and it was determined that the Project's contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts associated with the resource areas evaluated in this DEIR. Table 3-1- summarizes the cumulative projects included in the cumulative impact analysis and Figure 3-1, shows the locations of the projects.

ES.5 SUMMARY OF ALTERNATIVES

CEQA Guidelines Section 15126.6 provides a framework for the formulation and analysis of alternatives in an EIR. This Section states, "*An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but*

would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (CEQA Guidelines Section 15126.6(a)).

ES.5.1 Alternatives not Considered for Analysis

ES.5.1.1 Alternative Location

In order to meet the Project objectives, the Project needs to be located in immediate proximity to the McKay Point Check Structures and where the Kaweah River diverges into the Lower Kaweah River and St. Johns River. Alternative locations are considered infeasible and were not considered further.

ES.5.1.2 Alternative Depth

Reducing the depth of the reservoir is not a feasible alternative because the full depth is needed to effectively capture the flood flows during the wet season. In addition, the full depth is needed in order to obtain sufficient royalties from the aggregate that would fund the Project.

ES.5.1.3 Alternative Size

Size is also an important consideration as the resulting storage capacity corresponds to the potential to sufficiently capture flood flows. As such, a reduced size would not provide sufficient storage to realize Project objectives. In addition, the full size is needed in order to obtain sufficient royalties from the aggregate that would fund the Project. Alternative size is considered infeasible and was not considered further.

ES.5.2 Alternatives Considered for Analysis

ES.5.2.1 No Project Alternative

Under the No Project Alternative, the site would remain in its relatively undisturbed condition. The No Project Alternative would be considered environmentally superior because it would have no site impacts to Air Quality; Biological Resources; Cultural Resources; Geology and Soils; and Noise. However, the No Project Alternative, by definition, would not meet the Owners' Project objectives.

ES.5.2.2 Wet Excavation Method Alternative

Under the Wet Excavation Alternative, the slurry wall installation would be deferred until the majority of the excavation is completed. This would allow groundwater seepage to flow into the pit which would require the use of “wet excavation” methods. Draglines would most likely be used to remove the aggregate from the pit. Additionally, material processing (i.e., processing/wash plant and portable crush/recycle plant) directly within the excavation pit would no longer be feasible, and excavated material would have to be transported offsite for processing.

Key differences under the Wet Excavation Method Alternative as compared to the Project include:

- Slurry wall installation would be deferred until the majority of the excavation had been completed.

- Seepage would be allowed to flow into the excavation until equilibrium is reached with the surrounding aquifer.
- Excavation would occur below the water elevation using "wet excavation" equipment and techniques (i.e., underwater dredging using draglines).
- Excavated material would have to be transported offsite for processing
- No dewatering would be conducted until wet excavation is completed.
- Upon completing wet excavation, dewatering would be implemented to create the conditions needed to complete reservoir excavation by conventional methods.
- Dewatering would involve the pumping of approximately 3,500 acre-feet back into the aquifer via one of the following measures:
    - A series of onsite infiltration gallery consisting of onsite ditches located on the Project site that would be covered with granular materials to minimize evaporation;
    - Infiltration at one or more of the immediately adjacent ponds and/or infiltration galleries on the CEMEX facility (north of the Project site); and/or
    - Infiltration one or more of the immediately adjacent ponds on the Seaborn Facility (west of the Project site).
- After dewatering, the slurry wall would be installed and seepage would be the same as described for the Project.

ES.5.2.3 Clay Liner Installation Alternative

Under the Clay Liner Installation Alternative, the site would be developed in the same manner as the Project with one notable change. Specifically, under this alternative, early as feasible in the excavation phase, clay liners would be installed in lieu of the slurry walls around the perimeter of the excavation pit/reservoir to minimize groundwater seepage into/out of the reservoir and to maintain conditions dry enough to continue excavation activities. Due to the nature of the clay material present at the Project site, a clay liner could feasibly be used as an alternative to a slurry wall and is expected to keep the infiltration rate below the required 500 gallons per minute (gpm). As with the slurry walls, the clay liner would consist of below-grade barriers that restrict groundwater flow or support excavations and structures, using bentonite clay generated by excavation operations and collected onsite.

As with the slurry wall, clay liner construction would require clearing and grubbing of approximately 26 acres, and excavating approximately 109,000 cubic yards of native soil to form the trench where the clay liner would be installed. However, rather than importing bentonite and other silty/clay materials to the project site, as is proposed with the slurry wall, these materials would be generated onsite to construct the clay liner. Specifically, excavated soils would be screened and mix onsite for use in the clay liner, to generate the appropriate mixture of bentonite, silty/clay fines and native soil needed to construct the appropriate clay liner. The clay liner material would be placed into the trench. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the clay liner.

Key construction/design differences under the Clay Liner Installation Alternative as compared to the Project include the following:

- Bentonite, silty/clay fines and native soil would be generated onsite to construct the clay liner. No material would need to be imported/delivered to the Project site.
- Depending on the quantity of bentonite and silty/clay generated during reservoir excavation, timing of the installation of the clay liner would potentially be deferred when compared to the slurry wall.
    - The clay liner could not be fully constructed until a sufficient quantity of material is extracted and processed onsite.
    - This might necessitate the use of supplemental dewatering techniques (e.g., pumping, infiltration galleries/ponds, etc.) and/or the use if wet excavation equipment and techniques (i.e., underwater dredging) until the clay liner is complete.
- Depending on the properties of the excavated material/soil used to construct the clay liner, additional slope stability measures, such as the use of soil amendments and/or other reinforcing structures, may be required.

Table ES-2 Summary of Significant Environmental Impacts and Mitigation Measures

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
Air Quality (Impact AQ-2) – Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	**Mitigation Measure AQ-1** • Roads upon which material is hauled to the on-site plant for processing shall be controlled by methods that will achieve 90% reduction of fugitive dust. This can be achieved by frequent watering, use of chemical dust suppressants, or a combination of watering and chemical dust suppressants. Other methods which achieve 90% reduction of fugitive dust may be acceptable with Lead Agency approval.	**Less than Significant**
Biological Resources (Impact BIO-1) – Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	**Mitigation Measure BIO-1** • The following avoidance and minimization efforts shall be used as methods to avoid accidental take of all native nesting birds as a result of the Project. During all Project activities, the Owners shall use the following Mitigation Measures to minimize impacts to all native nesting birds: 1. The Owners shall rough grade all annual grassland and elderberry savannah within the construction footprint of the Project during the end of the non-nesting season (January 1 through February 15) of the year in which construction starts to ensure that there is no available nesting habitat for birds in these onsite habitats. 2. If construction is initiated during the nesting season (February 15 through August 15), the Owner's shall conduct a pre-construction nesting bird survey by a qualified wildlife biologist (approved by CDFW and TID) prior to any site preparation activities in association with any phase. The surveys shall be conducted 30 days prior any site preparation activities (vegetation clearing) and again no later than three days prior to any site preparation activities (vegetation clearing). The survey shall be conducted within all onsite habitats that could support nests and are within 120 feet or less of proposed construction activities. All active nests that are found during the survey will be geo-referenced	**Less than Significant**

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	with a global positioning system (GPS) unit and mapped on an appropriate scale map of the Project site (no smaller than 1 inch = 40 feet). Data will be collected for each active nest site and at a minimum will include: (1) identification of nesting species; (2) description of nest site; (3) estimated nesting cycle status (i.e., time to nest completion, egg-laying, fledging, etc.); and (4) likelihood of nest failure from adjacent project-related activities. Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any special-status species are present onsite, the Owners shall develop and implement a plan for the protection of these species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to CNDDB within ten (10) days of sighting. 3. All active nests found during the preconstruction survey will be monitored at least twice per week to assess whether adjacent project-related activities are adversely affecting the nest. If adverse effects are observed, all Project-related activities within 120 feet of the nest will be temporarily halted until fledging occurs (i.e., the juveniles are no longer dependent upon the nest). 4. No preconstruction nesting bird survey is required in areas within 120 feet of construction activities, if construction is initiated in the non-nesting season (August 15 to February 15). **Mitigation Measure BIO-2** The following measures shall be used to avoid or minimize indirect effects to nesting raptors as a result of the Project:	

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	• If construction is initiated during the nesting season (between February 15 and August 15), the Owners shall conduct a pre-construction nesting raptor survey by a qualified wildlife biologist (approved by CDFW and TID) prior to any site preparation activities in association with any phase. The surveys shall be conducted 30 days prior any site preparation activities (vegetation clearing) and again no later than three days prior to any site preparation activities (vegetation clearing). The survey shall be conducted within all onsite areas that could support nests and are within 300-feet or less of proposed construction activities. All active nests that are found during the survey will be geo-referenced with a global positioning system (GPS) unit and mapped on an appropriate scale map of the Project site (no smaller than 1 inch = 100 feet). Data will be collected for each active nest site and at a minimum will include: (1) identification of nesting species; (2) description of nest site; (3) estimated nesting cycle status (i.e., time to nest completion, egg-laying, fledging, etc.); and (4) likelihood of nest failure from adjacent project-related activities. Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any sensitive species are present onsite, the Owners shall develop and implement a plan for the protection of these species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to the CNDDB within ten (10) days of sighting. • All active raptor nests found during the preconstruction survey will be monitored at least twice per week to assess whether adjacent project-related activities are adversely affecting the nest. If adverse effects are observed, all Project-related activities within 300-feet of the nest will be temporarily halted until fledging occurs (i.e., the juveniles are no longer dependent upon the nest).	

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	• No preconstruction nesting raptor survey is required in areas within 300-feet of construction activities, if construction is initiated in the non-nesting season (August 15 to February 15). **Mitigation Measure BIO-3** • The following measures shall be used to avoid or minimize direct effects to western pond turtle as a result of the Project: 1. The Owners shall conduct a preconstruction survey for western pond turtle by a qualified wildlife biologist (approved by CDFW and TID) along the adjacent reaches of the Lower Kaweah River and St. Johns River. The survey shall be conducted by a qualified biologist within three days of the initiation of construction on those portions of the Project that occur in the rivers, or on their adjacent banks (if there is flowing or standing water in these reaches). If turtles are observed during the preconstruction survey, and a qualified biologist determines construction activities could harm the turtles, the qualified biologist shall conduct the salvage and relocation of turtles downstream to the nearest appropriate aquatic habitat during the same day of their capture. The aquatic habitat to which the turtles are being relocated shall be less than one (1) mile downstream of the Project. 2. All construction staff shall be aware of the potential to uncover western pond turtle nests or during grading and earthmoving activities involving the top 12 inches of soil. Construction staff shall be advised, if turtle eggs are discovered during such activities, construction shall be temporarily halted until a qualified biologist can evaluate the site and egg scatter. Construction staff shall be responsible for covering the eggs with a small layer of sand or soil (to prevent damage or overheating) prior to the arrival of the qualified biologist. The qualified biologist will then salvage the eggs and transport them to a nearby wildlife rehabilitation center that has been approved in advance by the CDFW. Release of any hatchling turtles from the wildlife rehabilitation	

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	center shall occur in either the Kaweah or St. Johns rivers in appropriate aquatic habitat. 3. All construction staff shall be aware of the potential to uncover Northern California legless lizards during grading and earthmoving activities involving the top 12 inches of soil. Therefore, monitoring for Northern California legless lizards shall be conducted concurrently with monitoring for western pond turtle nests. Construction staff shall be advised, if Northern California legless lizards are discovered during such activities, construction shall be temporarily halted until the individual can be captured by hand and placed in a lidded two-gallon bucket containing no less than three inches of moist soil from the location of capture. Construction staff shall be responsible for placing the bucket in a continuously cool, shaded, and protected location until the arrival of a qualified biologist. The qualified biologist will then relocate the individual(s) to an adjacent location at least 100 feet beyond the boundaries of the Project that has been approved in advance by the CDFW. **Mitigation Measure BIO-4** • The following measures shall be used to compensate for direct and indirect effects to Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp as a result of the Project: 1. The Owners shall conduct preconstruction surveys for Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, and Tulare cuckoo wasp during the known active season of each of these species prior to the commencement of construction activities. The survey shall be conducted by a qualified biologist within all onsite habitats that could support these species. 2. If individuals of Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp are found during the preconstruction survey, pertinent data regarding the associated habitat	

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	(e.g., vegetation communities, soils, associated invertebrate species, etc.) shall be collected to better understand the ecology of the species. 3. All pertinent data collected during the preconstruction survey shall be included in the information submitted to the California Natural Diversity Data Base (CNDDB) along with the new occurrence record. Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any of these special-status invertebrates are found to be present onsite, the Owners shall develop and implement a plan for the protection of the species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to the CNDDB within ten (10) days of sighting. 4. If individuals of Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp are found during the preconstruction survey, an impact avoidance and minimization plan shall be developed and implemented for the species onsite. The plan will focus on temporary or permanent avoidance of occupied habitat where feasible using exclusionary fencing (temporary or permanent). Where avoidance is not feasible impacts shall be minimized through onsite biological monitoring. The onsite biological monitor shall have authority to temporarily halt any work that would directly impact occupied habitat and determine if a smaller impact footprint is feasible. Work shall then resume after concurrence on the necessary impact footprint. **Mitigation Measure BIO-5** • The following measures shall be used to avoid or minimize direct effects to San Joaquin kit fox as a result of the Project:	

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	1. On-road haul truck trips to and from the Project site shall be limited to the period 0.5 hours prior to sunrise to 0.5 hours after sunset. 2. On-road haul trucks and other vehicles utilizing the existing access road on the Seaborn site shall be limited to a maximum speed of 10 miles per hour. 3. The entry into the Seaborn site on the existing access road shall be signed as follows "Watch for Wildlife Crossing the Road." The sign shall be a minimum of 4-feet by 4-feet in size with minimum 12-inch block letters. **Mitigation Measure BIO-6** • To avoid wildlife injury or mortality related to fencing materials, all hollow fence posts shall be capped and all empty bolt holes in metal fence posts shall be plugged. The use of sharp fencing materials is prohibited, including, but not limited to, spikes, glass, razor, or barbed wire. The use of erosion-protection materials using plastic/nylon netting is prohibited.	
Biological Resources (Impact BIO-2) – Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**Mitigation Measure BIO-7** • The Owners shall prepare and implement an Oak-Riparian Habitat Management Plan that identifies the management areas and requires any excavation to remain outside of those identified areas. It will also require that the construction of the reservoir inlet and outlet channels be located and built in such a manner to minimize loss of habitat.	**Less than Significant**
Biological Resources (Impact BIO-3) – Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.)	**Mitigation Measure BIO-8** • The following measures shall be used to avoid, minimize, or compensate for fill of jurisdictional waters and the removal of riparian vegetation as a result of the Project:	**Less than Significant**

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
through direct removal, filling, hydrological interruption, or other means.	1. The Owners shall consult with the Regional Water Quality Control Board (RWQCB) and if determined necessary, submit a Section 404 permit application for fill of jurisdictional waters of the United States that includes a wetland protection and compensation plan. At a minimum, the wetland protection and compensation plan shall require 3:1 compensation for permanent effects to jurisdictional waters of the United States and 1:1 compensation for temporary effects to jurisdictional waters of the United States. 2. The Owners shall submit an application for fill of waters subject to the jurisdiction of the CDFW (i.e., long-term lake and streambed alteration agreement). The application shall include a Wetland Protection and Compensation Plan that, at a minimum, requires 3:1 compensation for permanent effects and 1:1 compensation for temporary effects to waters under the jurisdiction of the State.	
Cultural Resources (Impact CUL-1) – Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5.	**Mitigation Measure CUL-1** • Prior to significant ground disturbance, conduct general Project area geoarchaeological testing and limited subsurface testing with shovels and augers at the location of P-54-005096. If a large intact buried archaeological/cultural deposit is identified, additional extended site testing would be needed to complete the CEQA-required assessment of the resource's significance and eligibility for inclusion in the CRHR. **Mitigation Measure CUL-2** • Consistent with state regulations, in the event archaeological/cultural resources are encountered during Project development or ground-disturbing activities within any portion of the Project area, all work within 100-feet (30 meters) of the find must be halted until a Secretary of the Interior qualified professional archaeologist can identify the discovery and assess its significance. Such finds include, but are not limited to, prehistoric stone grinding implements, stone tools, soapstone bowls, ornaments (e.g., beads, pendants), features such as	**Less than Significant**

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
	burned soil, earthen ovens, and floors of shelters as well as intact historic-era building foundations and concentrations of historic artifacts.	
Cultural Resources (Impact CUL-2) – Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.	**Mitigation Measure CUL-1** • See above. **Mitigation Measure CUL-2** • See above.	**Less than Significant**
Cultural Resources (Impact CUL-3) – Would the Project disturb any human remains, including those interred outside of dedicated cemeteries.	**Mitigation Measure CUL-3** • If human remains are uncovered during construction, the Tulare County Coroner is to be notified immediately and must investigate the discovery. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 requires that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend means of treatment for the human remains pursuant to California Public Resources Code 5097.98.6.	**Less than Significant**
Geology and Soils (Impact GEO-6) – Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Mitigation Measure GEO-1** • A Paleontological Resource Mitigation and Monitoring Program (PRMMP) will be prepared by a qualified professional. The PRMMP will include the following: o A Worker's Environmental Awareness and Training Program to be implemented prior to the start of excavating the pit. o The PRMMP will indicate where construction monitoring is required for the Project and the frequency of required monitoring including: • Initial period of spot-checking during the preliminary shallow excavation activities. • Monitoring at depths below 5 feet. • The PRMMP will describe the different reporting standards to be used – monitoring with negative findings versus monitoring resulting in fossil discoveries.	**Less than Significant**

Significant Impacts (Before Mitigation)	Summary of Mitigation Measures (See DEIR Section 3.0 for Details)	Level of Significance (After Mitigation)
Noise (Impact NO-1) – Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Mitigation Measure NO-1** • Onsite material processing operations occurring at or above a depth of 16-feet below ground surface shall be prohibited between the hours of 4:00 a.m. and 7:00 a.m. **Mitigation Measure NO-2** • In order to reduce the noise level at Receptor 1 (R1) to less than the significance threshold, TID must utilize one of the following measures. This mitigation measure is not required once the processing plants or other sources of noise that could result in an exceedance of the noise threshold criteria are relocated to a minimum depth of 16-feet below ground surface: o Vacate the residence located at Receptor R1 when noise exceedances would occur; or o Inform the occupant of Receptor R1 that temporary elevated noise levels may result during certain periods of the Project, and obtain a signed waiver from the tenant indicating that they choose to remain in the house despite the temporary increase in noise levels. The waiver should describe the potential level of exceedance, times periods and approximate length of time that the exceedances could occur.	**Less than Significant**

1.0 INTRODUCTION

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, commonly referred to as the McKay Point property. The Owners propose to construct and operate a surface water storage and re-regulation reservoir, the McKay Point Reservoir, on the property. The construction and operation of this reservoir is the Project under review.

The reservoir would allow for better management of surface water by providing 4,600 acre-feet of water storage capacity to support water demands during dry seasons, additional flood control and storm water management during the wet season.

TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah and St. Johns River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code.

Implementation of the Project requires discretionary approvals from TID for the construction and operation of the reservoir and from the Tulare County (County), under the California Surface Mining and Reclamation Act (SMARA), for the excavation of approximately 110 acres needed to create the reservoir. TID is the lead agency for the purposes of administering the requirements of the California Environmental Quality Act (CEQA) and for preparing this Draft Environmental Impact Report (DEIR). TID is also the Project applicant on behalf of the Owners.

1.1 Project Summary

The Project is located in Tulare County, California, 1.0 miles northwest of the community of Lemon Cove and 2.5 miles southeast of the community of Woodlake (Figure 1-1 – Location Map). The Owners propose to construct and operate the Project on the north side of the divergence of the Lower Kaweah River and St. Johns River (North Parcel) adjacent to and downstream of McKay Point (Figure 1-2 – Project Site and Surrounding Land Use). The area around the Project site has historically been used for agriculture, cattle grazing and aggregate mining. The Project site itself has primarily been used for cattle grazing.

The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir. The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and, operation of the reservoir. The Owners intend to enter into a lease agreement with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir.

Once the construction of the reservoir is completed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, and groundwater recharge supplies.

The operations of the reservoir would be closely coordinated with the other water control structures in the area such as the McKay Point Check Structures. The operation of the reservoir would be managed by a Supervisory Control and Data Acquisition (SCADA) system which would monitor the reservoir and river levels, monitor and operate the inflow and outflow channels, and monitor and coordinate with the automated gates of the existing McKay Point Control Structures. SCADA equipment allows for remote monitoring, control, and operations by TID operators from TID's offsite administrative office in Tulare, California. Section 2.0 – Project Description provides a detailed discussion of the construction and operations of the reservoir. Figure 2-4 shows the final reservoir site plan.

To receive river water into the reservoir, the electrically operated weir on the inflow channel would be lowered. Water would flow by gravity into the reservoir up to a maximum flow rate of 500 cubic feet per second (cfs) via the inflow channel. Upon achieving water level equilibrium between reservoir and river, the electrically operated weir would be raised. As the level of the river recedes, either by the passing of the flood peak, or by lowering the gates on the McKay Point Check Structures, the electrically operated weir would serve to hold water in the reservoir. When the St. Johns River water level is lower than that of the reservoir, lowering the electrically operated weir on the outflow channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs.

1.2 Project Objectives and Benefits

The Owners' objectives in proposing the Project include the following:

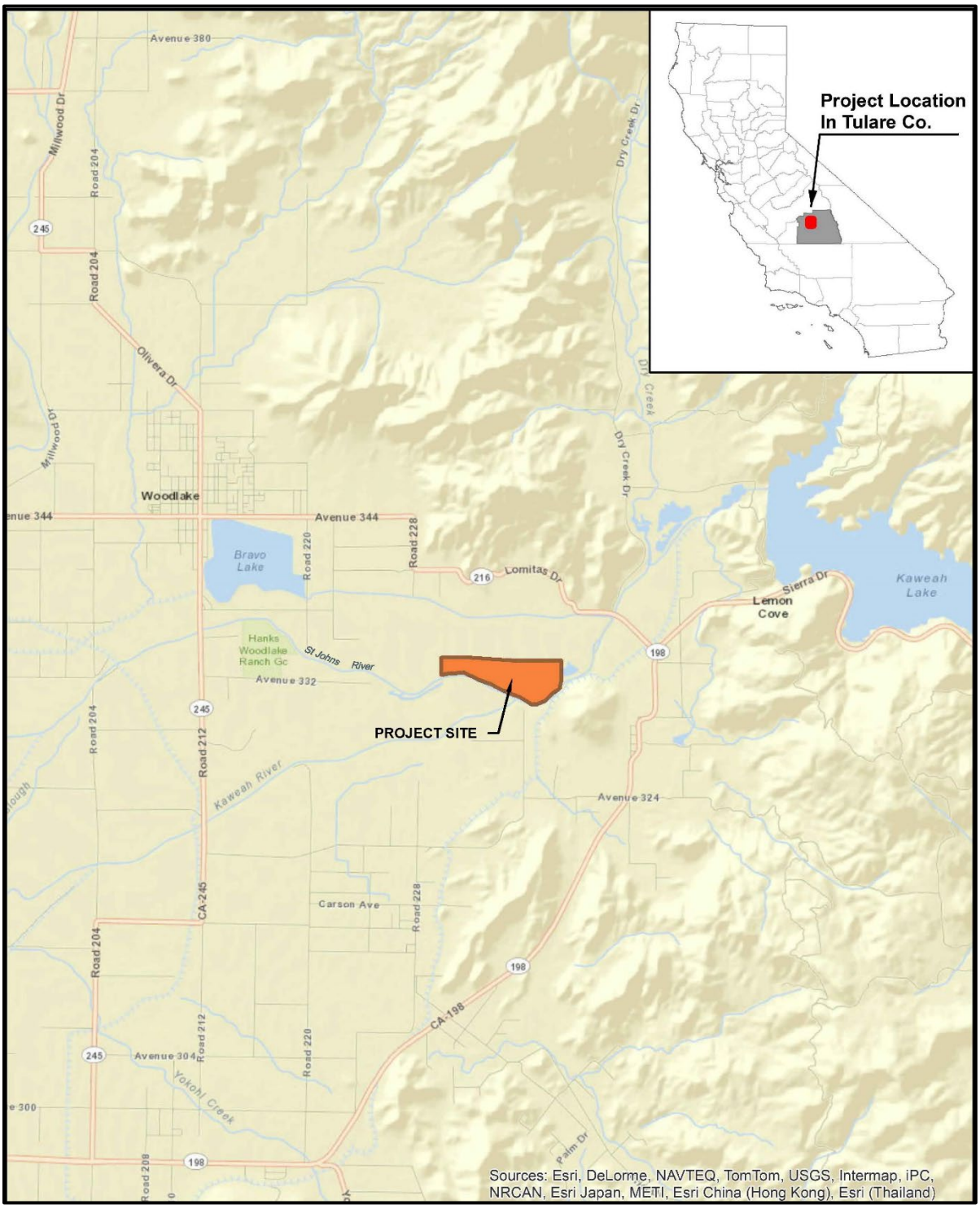
- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet as part of the proposed Project.
- Deliver water back to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCSG to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the construction and development costs.

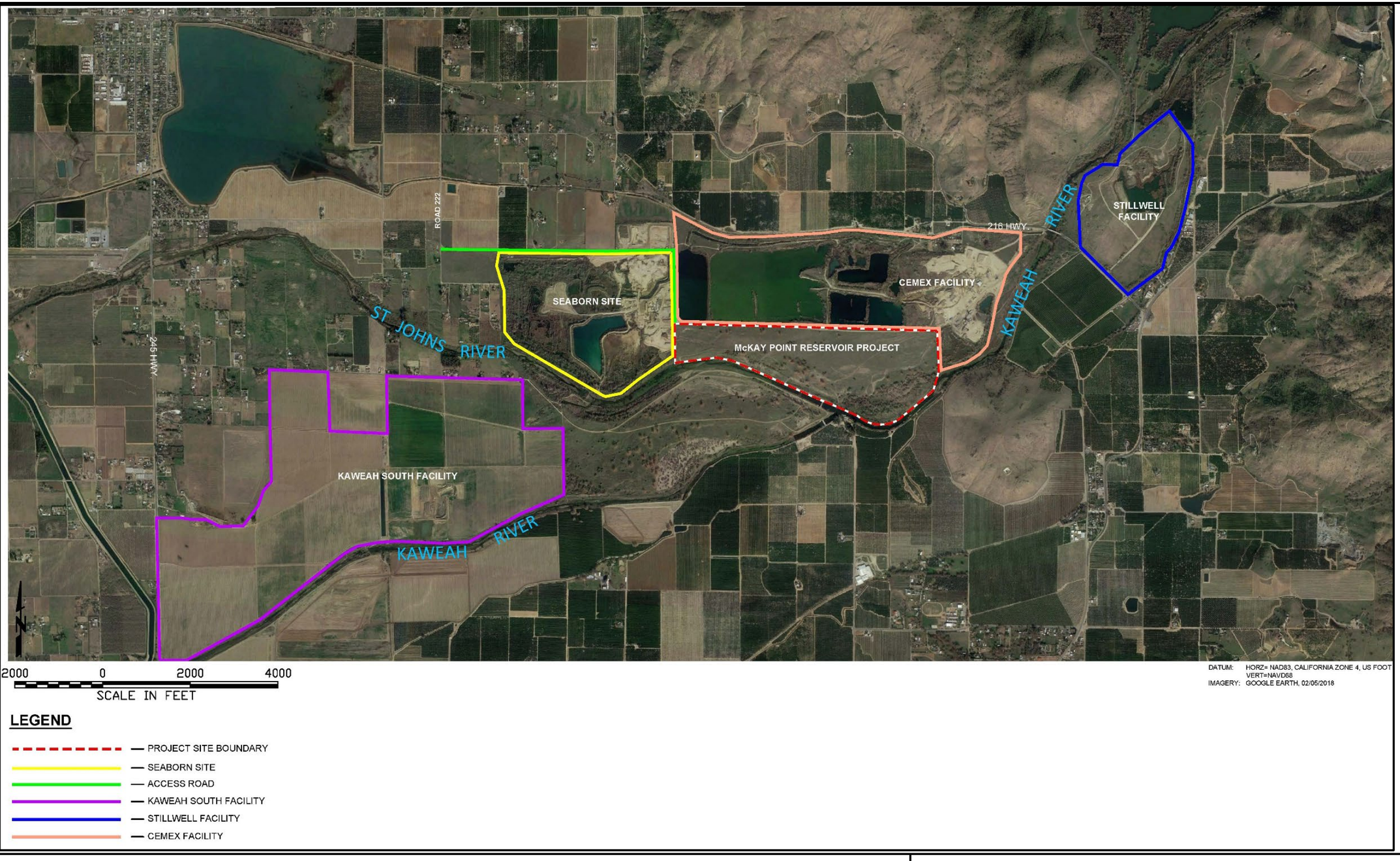
Once the reservoir is constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.



Source: Provost & Pritchard Consulting Group (October 2013)

Figure 1-1 Location Map



Source: Sespe Consulting, Inc. (October 2020)

Figure 1-2 Project Site and Surrounding Land Uses

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1.3 CEQA Process

CEQA is a California statute passed in 1970 to institute a statewide policy of environmental protection. CEQA does not directly regulate land uses, but instead requires State and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts.

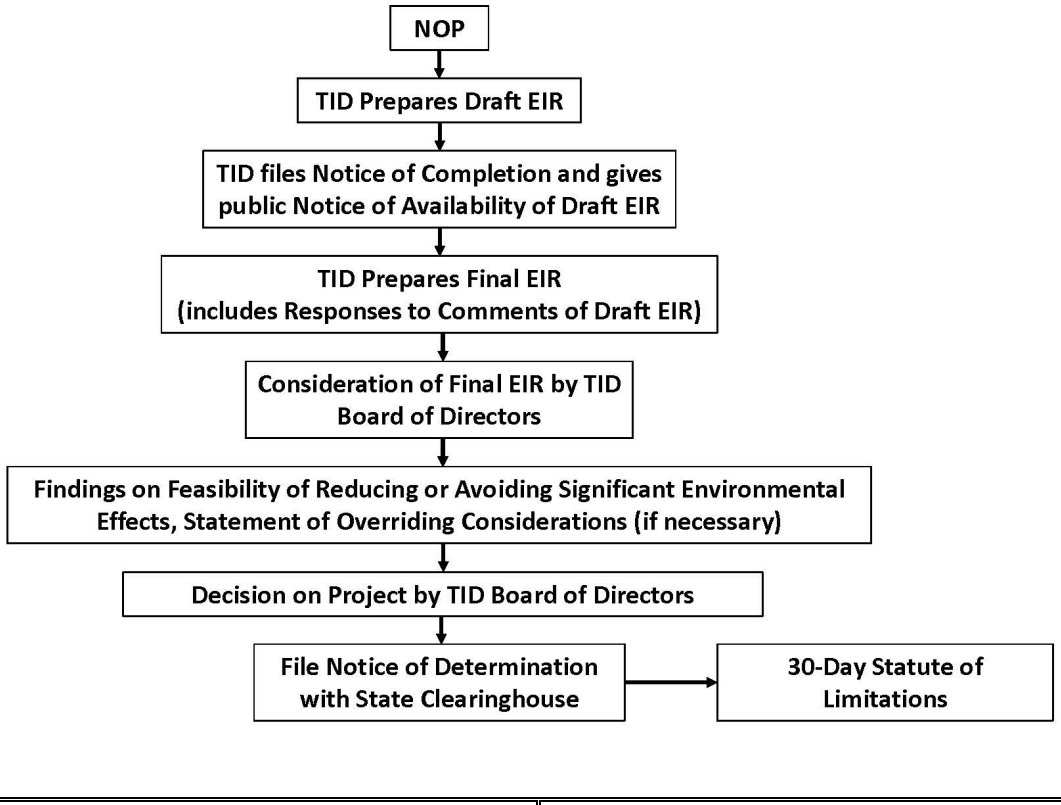
The CEQA Guidelines were developed to explain and interpret the law for both the public agencies required to administer CEQA and for the public generally. The CEQA Guidelines provide objectives, criteria and procedures for the orderly evaluation of projects and the preparation of environmental documents. The fundamental purpose of the Guidelines is to make the CEQA process comprehensible to those who administer it, to those subject to it, and to those for whose benefit it exists. To that end, the Guidelines are more than mere regulations which implement CEQA, as they incorporate and interpret both the statutory mandates of CEQA and the principles advanced by judicial decisions.

The involvement of the public during the CEQA process is an integral part of the environmental analysis. Public involvement helps to refine the proposed action, identify issues, explore possible alternatives and identify interested and affected persons. The sections below describe the actions taken to ensure that the public has been and will be appropriately involved in this process.

A detailed flow chart of the entire CEQA process is provided in Appendix A of the CEQA Guidelines. Figure 1-3 is a simplified flow chart of the CEQA process as it applies to this Project. In general, the CEQA process for an EIR involves the following steps:

- Lead Agency preparation of an Initial Study and/or determination of the need for an EIR;
- Notice of Preparation (NOP);
- Scoping process;
- Preparation of a DEIR;
- Notice of Completion (NOC) and DEIR public and agency review process;
- Response to comments;
- Preparation of a Final EIR; and
- Notice of Determination (NOD).

These steps and how they are being addressed for this Project are discussed in the following sections.



Source: California Natural Resources Agency

Figure 1-3 CEQA Process Flowchart

1.3.1 Initial Study, Notice of Preparation and Scoping Process

In accordance with CEQA Guidelines Section 15063, an Initial Study may be prepared to determine if a proposed project may have a significant effect on the environment. An Initial Study is not required if the CEQA Lead Agency can determine that an EIR will clearly be required for a proposed project. TID, as Lead Agency, determined an EIR would be required for this Project; therefore, an Initial Study was not prepared.

After deciding that an EIR is required for a project, the Lead Agency shall send to the Office of Planning and Research (OPR) and each responsible and trustee agency a Notice of Preparation (NOP) stating that an EIR will be prepared. The NOP includes a Project Description. The NOP is also made available to the public notifying them of the Project and the opportunity to provide comments during a scoping meeting.

The public scoping process provides a mechanism for focusing and clarifying the issues to be addressed in the DEIR by actively obtaining input from the public and interested federal, state, tribal, and local agencies. Information received during the scoping assists the Lead Agency in identifying potential environmental issues, impacts, project alternatives, and mitigation measures associated with the Project.

TID submitted the NOP for this Project to Office of Planning and Research (OPR) on October 2, 2020. The scoping period ended on November 4, 2020. The State Clearinghouse (SCH) assigned the Project the

following identification number SCH #2014011078. The NOP was made available on the TID website at: https://tulareid.org/engineering-capital-projects or www.mckaypoint.com. The notice was posted on the outside noticing box located in front of the Tulare Irrigation District office at the following address: 6826 Avenue 240 – Tulare, California 93274. The NOP was also published in the Visalia Times-Delta, a local newspaper. A copy of the NOP is in Appendix A of this DEIR.

TID held two (2) scoping meetings to receive comments on the proposed Project and potential environmental impacts. In accordance with the Governor's Executive Order (N-29-20) and the declared State of Emergency, including social distancing directives as a result of the COVID-19 virus, the scoping meetings were held remotely. There was not a physical location for the meetings. Two public scoping meetings were held remotely via WebEX on October 15, 2020 at 5:30 p.m., and October 16, 2020 at 9:00 a.m.

Written comments were also received during the scoping period. Copies of these letters and emails, the list of those who provided comments, and a copy of the presentations provided during the meeting are located in Appendix A of this DEIR.

Table 1-1 provides a brief summary of the areas of concern received during the scoping process and where these concerns and comments are addressed in the DEIR. In order to fully identify the issues raised, copies of the letters/emails are provided in Appendix A. These comments will be incorporated into the EIR Administrative Record for the Project and are addressed in this DEIR, as appropriate.

Table 1-1. Issues Raised During Scoping Period

Area of Concern	DEIR Section
Reclamation Plan.	Section 2.0 – Project Description
Potential impacts to real estate and quality of life.	Section 3-0 – Environmental Impact Analysis
Permit requirements, specifically Central Valley Flood Protection Board encroachment permit and US Army Corp of Engineers 404 permit.	Section 1.0 - Introduction Section 3.7 – Hydrology and Water Quality Section 3.2 – Biological Resources
Details of the excavation of the pit for the construction of the reservoir.	Section 2.0 – Project Description Section 3.0 – Environmental Impact Analysis
Drought conditions and water supply.	Section 3.7 – Hydrology and Water Quality
Impacts to local groundwater wells.	Section 3.7 – Hydrology and Water Quality

1.3.2 Notice of Completion and DEIR Review Process

The Notice of Availability (NOA)/Notice of Completion (NOC) for the DEIR was filed on March 1, 2024 and distributed to public agencies, other affected agencies, adjacent cities, and counties, members of the public, and any parties who have submitted a written request for a copy of the DEIR. It was also posted in the Visalia Times-Delta newspaper on March 1, 2024, and on the outside noticing box located in front of the Tulare Irrigation District office at the following address: 6826 Avenue 240 – Tulare, California 93274. A copy of the NOA/NOC is provided in Appendix A of this DEIR. The 45-day public review period for the

DEIR started on March 1, 2024, and a copy of the DEIR was available for public review on the TID Website: http://www.tulareid.org.

1.3.3 Response to Comments, Final EIR, Certification, Findings and Notice of Determination

As required by CEQA, following the close of the public review period on the DEIR, comments on a project will be compiled and responses will be generated in conjunction with the preparation of the Final Environmental Impact Report (FEIR). The FEIR will consist of a list of all persons, organizations, and public agencies commenting on the DEIR; copies of the comments received on the DEIR; responses to comments; and any other pertinent information added by the lead agency. Prior to approving a project, the Lead Agency shall certify that the FEIR has been completed in compliance with CEQA and that it reflects the agency's independent judgment and analysis.

The Lead Agency shall file a Notice of Determination (NOD), and the FEIR will serve as the CEQA compliance document for the decision-making agency (in this case TID Board of Directors) and any other agencies that may be responsible for review of the Project and issuance of required permits and approvals.

No public agency shall approve a project for which an EIR has identified one or more significant environmental effects unless the agency makes findings for each of those significant effects. CEQA Guidelines Section 15093 states:

a) *"CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If specific economic, legal, social, technological, or other benefits of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered 'acceptable.*

b) *When the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record."*

The Lead Agency shall file a NOD within five working days after deciding to carry out or approve a project. The FEIR will serve as the CEQA compliance document for the decision-making agency (in this case TID) and any other agencies that may be responsible for review of a project and issuance of required permits.

1.4 Mitigation Monitoring and Reporting

CEQA requires adoption of a reporting and monitoring program referred to as the Mitigation Monitoring and Reporting Program (MMRP) for those measures or conditions placed on a project to mitigate or avoid adverse effects on the environment. A final MMRP shall be adopted for this Project by TID upon certification of the FEIR.

The MMRP will contain the following elements:

- A list of measures that will act to mitigate potentially significant impacts on the environment and the actions necessary to ensure compliance.
- A procedure of compliance and verification that will be outlined for each action necessary. This procedure will designate who will take action, what action will be taken and when, and to whom and when compliance will be reported.
- The MMRP will provide focused, yet flexible guidelines. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the program.

TID is the primary agency for monitoring the implementation of the majority of the mitigation measures identified in the EIR and ensuring compliance with these measures. In some cases, other public agencies, such as SMARA, San Joaquin Valley Unified Air Pollution Control District (SJVAPCD), California Department of Fish and Wildlife (CDFW), the County of Tulare, the Central Valley Regional Water Quality Control District (CVRWQCD), the U.S. Army Corp of Engineers (Army Corp) and the U.S. Fish and Wildlife (USFW) may also oversee implementation of one or more measures. The Applicant is responsible for funding the implementation of each measure.

1.5 Agency Involvement

1.5.1 Lead Agency

CEQA Guidelines Section 15367 defines the Lead Agency as "… *the public agency, which has the principal responsibility for carrying out or approving a project*." Criteria considered in identifying the Lead Agency include whether the agency: 1) has the greatest responsibility for supervising or approving the project as a whole; 2) is an agency with the general governmental powers; and 3) will act first on the project in question (CEQA Guidelines §15051). As discussed above, the Lead Agency for the Project is TID.

This DEIR reflects the independent judgment and analysis of TID as required by the CEQA Guidelines. Lists of organizations and persons consulted and the report preparation personnel are provided in Section 6.0 – Report Preparation Resources and Organizations and Persons Consulted.

1.5.2 Trustee and Responsible Agencies

In addition to TID acting in its capacity as Lead Agency, there are a number of other agencies that may have discretionary authority over the Project, including Trustee and Responsible Agencies.

A Trustee Agency is a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California. The CDFW, the USFWS, US Army Corp, California Department of Conservation (DOC) Division of Mine Reclamation (DMR), and the CVRWQCB are potential Trustee Agencies for this Project.

A Responsible Agency is a public agency which proposes to carry out or approve a project, for which a Lead Agency is preparing or prepared an EIR. For the purposes of CEQA, the term "Responsible Agency" includes all public agencies other than the Lead Agency which have discretionary approval power over the project. The SJVAPCD, County of Tulare, and the CVRWQCB are potential Responsible Agencies for this Project.

To comply with the Executive Order regarding Government-to-Government actions and when a proposed project may have an effect on Tribal Cultural Resources (TCR), notice and opportunity to comment must be provided to the Tribal Agencies. This is often accomplished by contacting the Native American Heritage Commission (NAHC).

In addition, in accordance with Public Resource Code Sections 21074 (AB 52), the Lead Agency, if requested by a California Native American Tribe that is traditionally and culturally affiliated with the geographic area of a project site, must conduct formal consultation with the tribe(s) which may include discussion of the type of environmental review necessary, the significance of tribal cultural resources, the significance of a project's impacts on tribal cultural resources, and, if necessary, project alternatives or the appropriate measures for preservation or mitigation that the California Native American tribe may recommend to the lead agency.

1.6 Permits, Approvals and Other Requirements

Table 1-2 identifies potential permits, approvals, and regulations that may be required for the Project. Section 3.0 – Environmental Impact Analysis, provides detailed discussions of the regulatory requirements for the Project as they relate to each of the resource areas evaluated.

Table 1-2. Potential, Anticipated or Required Permits, Approvals and Regulatory Requirements

Public Agency	Approval Required
Tulare Irrigation District	• Certification of Environmental Impact Report • Approval of Project
Tulare County (Resource Management Agency)	• Surface Mining Permit • Surface Mining and Reclamation Plan • Financial Assurance Cost Estimate (FACE)
Tulare County (Health and Human Services Agency, Environmental Health: Certified Unified Program Agency)	• Spill Prevention, Control, and Countermeasure (SPCC) Plan • Hazardous Materials Business Plan (HMBP) • Hazardous Materials Inventory • Above-Ground Storage Tank (diesel) and Generators Hazardous Materials Handler Permit
San Joaquin Valley Air Pollution Control District	• Authority to Construct • Permit to Operate

Public Agency	Approval Required
Central Valley Regional Water Quality Control Board	• National Pollutant Discharge Elimination System (NPDES) Permit (General) • Storm Water Pollution Prevention Plan (SWPPP) • Clean Water Act Section 401 Water Quality Certification • Encroachment Permit and Waste Discharge Requirements (WDRs)
California Dept. of Fish and Wildlife	• Streambed Alteration Agreement (SAA)
California Dept. of Conservation (DOC), Division of Mine Reclamation (DMR)	• Review of Surface Mining and Reclamation Plan • Review of Financial Assurance Cost Estimate (FACE)
U.S. Army Corps of Engineers	• Section 404 Permit (the Clean Water Act)

1.7 Project Baseline

Under CEQA, the impacts of a proposed project must be evaluated by comparing expected environmental conditions after project implementation to conditions at a point in time referred to as the baseline. The changes in environmental conditions between those two scenarios represent the environmental impacts of the proposed project. If there is no net change between the project baseline and the proposed project then there would be no environmental impact.

1.8 Environmental Issues Not Requiring Further Detailed Evaluation in the Draft EIR

Based on the CEQA Guidelines thresholds of significance, the following environmental resources areas were determined not to be significantly affected by the implementation of the Project; therefore, these resource areas were found to have No Impacts or Less than Significant Impacts and therefore did not require further detailed analysis in this DEIR (CEQA Guidelines Section 15128). Nonetheless, these environmental resources are discussed within the following DEIR sections:

- Aesthetics (DEIR Section 3.1);
- Agriculture and Forestry Resources (DEIR Section 3.2);
- Energy (DEIR Section 3.6);
- Mineral Resources (DEIR Section 3.12);
- Population and Housing (DEIR Section 3.14);
- Public Services (DEIR Section 3.15);
- Recreation (DEIR Section 3.16);
- Transportation (DEIR Section 3.17); and
- Utilities/Service Systems (DEIR Section 3.19).

The following sections provides a summary of applicable explanations as to why it was determined that these resources areas were found to have no impacts and therefore did not require significant analysis in this DEIR. Also see the DEIR sections listed above for additional detail.

1.8.1 Aesthetics

Appendix G of the CEQA Guidelines contains a checklist of environmental effects that may be considered significant. Under the category of "Aesthetics," a project is considered to have a significant visual impact on the environment if it would:

a) *Have a substantial adverse effect on a scenic vista (CEQA Appendix G Threshold (a));*

b) *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway (CEQA Appendix G Threshold (b));*

c) *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality (CEQA Appendix G Threshold (c)); or*

d) *Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area (CEQA Appendix G Threshold (d)).*

The California Scenic Highway Mapping System notes that State Highway 198 is an Eligible State Scenic Highway – Not Officially Designated. State Highway 198 passes to the southeast of the Project where intervening terrain would preclude any view of the Project. State Highway 216, which has no State Scenic Highway status, passes north of the Project and is 0.7 miles from the Project at its closest point.

The Project is adjacent to the Kaweah and St. Johns Rivers. The Project is set back from the rivers' banks and the Project would not involve any large above-grade structures that would be visible from the rivers. Because dry mining techniques would be used during the Project excavation phase, there would be no need for draglines that could have an adverse impact on the views from the rivers. Mining operations located adjacent to or in the area surrounding the Project site have been in existence since the 1940s; therefore, the Project would not change the visual character of the area.

The issue of light and glare is typically associated with excessively bright nighttime lighting that crosses over property lines (i.e., "light trespass") and illuminates offsite yards or bedroom windows. It is also associated with the condition that occurs when excessive nighttime lighting creates a "skyglow" effect. The excavation and construction phases of the Project would occur primarily during daylight hours (between dawn and 6:00 p.m.). Activities taking place during the time of year when daylight hours are shorter, some lighting may be required to provide a safe working environment. If nighttime lighting is required, high pressure sodium and/or cut-off fixtures (or equivalent International Dark-Sky Association [IDA]-approved fixtures) would be used and the lighting would also be designed to confine illumination to the Project site and/or to areas that do not include light-sensitive uses. Except for security lighting, no nighttime lighting would be required during the Project operations phase.

The Project would have no impact to scenic vistas and aesthetics from roadways or the river; therefore, the Project would have no significant impacts related to aesthetics or nighttime lighting. Refer to DEIR Section 3.1 – Aesthetics for additional detail.

1.8.2 Agriculture and Forestry Resources

Under the Appendix G of the CEQA Guidelines category of "Agriculture and Forestry Resources" a project is considered to have a significant impact on the environment if it would:

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use (CEQA Appendix G Threshold (a))?*

b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract (CEQA Appendix G Threshold (b))?*

c) *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) (CEQA Appendix G Threshold (c))?*

d) *Result in the loss of forest land or conversion of forest land to non-forest use (CEQA Appendix G Threshold (d))?*

e) *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use (CEQA Appendix G Threshold (e))?*

The California Resources Agency, Division of Land Resource Protection maintains information pertaining to, and the mapping of, farmland. The entire Project site is designated as "Grazing Land", which, among other definitions, includes "land on which the existing vegetation is suited to the grazing." The Project site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract. Historically, the site has been used for cattle grazing.

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20-Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). Within the AE-20 zone, the County permits mining and the extraction of minerals, upon approval of a Reclamation Plan and Financial Assurance Cost Estimate (FACE).

There are no forestlands on or near the Project site. The Project would also not result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965, or Farmland Security Zone Contract pursuant to Public Resources Code § 15206(b)(3).

The Project would have no impact on agriculture or forestlands. Refer to DEIR Section 3.2 – Agriculture and Forestry Resources for additional detail.

1.8.3 Energy

Under the Appendix G of the CEQA Guidelines category of "Energy" a project is considered to have a significant impact on the environment if it would:

a) *Result in potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources, during the project construction or operation (CEQA Appendix G Threshold (a))?*

b) *Conflict or obstruct a state or local plan for renewable energy or energy efficiency (CEQA Appendix G Threshold (b))?*

The Project would not result in an increase of employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. The electrical services required for the onsite processing equipment would be obtained from Southern California Edison (SCE) from an existing powerline located on the north perimeter of the Project site. Additionally, the Project would provide a local source of aggregate to the County which would minimize the need to import aggregate from further away, thus reducing fuel consumption associated with long distance trucking. For these reasons, the Project would have no significant impacts on energy resources.

Based on knowledge of the proposed projects in the Project area, the Project would not conflict or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project would have no impact on renewable energy plans. Refer to DEIR Section 3.6 – Energy for additional detail.

1.8.4 Mineral Resources

Under the Appendix G of the CEQA Guidelines category of "Mineral Resources" a project is considered to have a significant impact on the environment if it would:

a) *Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state (CEQA Appendix G Threshold (a))?*

b) *Result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan (CEQA Appendix G Threshold (b))?*

Implementation of the Project would not result in the loss of availability of a known mineral resource that is either locally-important or of value to the residents in the region or the State. Rather, as a result of the need to excavate the Project site in order to construct the reservoir, the Project proposes to develop this resource.

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20 Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). The State Geologist, in accordance with the State Board's Guidelines for Classification and Designation of Mineral Lands, has classified the underlying land as MRZ-2b, which includes:

> *Areas underlain by mineral deposits where geologic data indicate that significant inferred resources are present. Areas classified MRZ-2b contain discovered mineral deposits that are either significant inferred resources or indicated reserves. Land included in MRZ-2b is of importance because it contains potential economic mineral deposits.*

An example of loss of availability in this instance would be the development of residential housing atop an area classified by the State Geologist as MRZ-2b. The excavation of lands so classified, and the subsequent processing of the resulting materials, is the utilization of such resources, which is consistent with an MRZ-2b classification.

The Project would have no impact on mineral resources. Refer to DEIR Section 3.12 – Mineral Resources for additional detail.

1.8.5 Population and Housing

Under the Appendix G of the CEQA Guidelines category of "Population and Housing" a project is considered to have a significant impact on the environment if it would:

a) *Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) (CEQA Appendix G Threshold (a))?*

b) *Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere (CEQA Appendix G Threshold (b))?*

The Project would employ 7 to 12 people during the excavation and construction phases, which is less than the baseline of 10 to 18 employees associated with aggregate operations on the Seaborn site (baseline). The operation of the reservoir would be managed remotely primarily by TID employees from TID's offsite administrative office in Tulare, California. The Project would not require hiring additional TID employees. This would not induce substantial population growth in the area. There are no houses located on the Project site; therefore, the Project would not result in the displacement of any existing housing. The Project would not induce growth, growth would occur whether or not the Project is implemented.

The Project would have no impact on population and housing. Refer to DEIR Section 3.14 – Population and Housing for additional detail.

1.8.6 Public Services

Under the Appendix G of the CEQA Guidelines category of "Public Services" a project is considered to have a significant impact on the environment if it would:

a) *Result in physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services (CEQA Appendix G Threshold (a)):*
    i. *Fire protection?*
    ii. *Police protection?*
    iii. *Schools?*
    iv. *Parks?*
    v. *Other public facilities?*

The Project would not result in additional employee and vendor vehicles/on-road haul trucks on public roadways above baseline levels. Therefore, the Project would not interfere with public services such as fire and police protection. The Project would not involve any activities that would impacts schools, parks, public services or communications. Potential impacts associated with noise, air quality, odor, and water quality are fully evaluated in Section 3.0 Environmental Impact Analysis.

Therefore, the Project would have no impact on public services. Refer to DEIR Section 3.15 – Public Services for additional detail.

1.8.7 Recreation

Under the Appendix G of the CEQA Guidelines category of "Recreation" a project is considered to have a significant impact on the environment if the following are found to be true:

a) *Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated (CEQA Appendix G Threshold (a))?*

b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment (CEQA Appendix G Threshold (b))?*

The number of employees needed for the Project operations would be a decrease from baseline. As a result, any use of recreational facilities resulting from Project implementation would not result in physical deterioration, and thus no impacts would result.

The Project does not include or require recreational facilities; therefore, no impacts would result. Refer to DEIR Section 3.16 – Recreation for additional detail.

1.8.8 Transportation

Under the Appendix G of the CEQA Guidelines category of "Transportation" a project is considered to have a significant impact on the environment if it would:

a) *Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities (CEQA Appendix G Threshold (a))?*

b) *Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) (CEQA Appendix G Threshold (b))?*

c) *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (CEQA Appendix G Threshold (c))?*

d) *Result in inadequate emergency access (CEQA Appendix G Threshold (d))?*

Because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would not be increased. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be

managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. Therefore, the Project would not interfere with transportation or result in an increase of local traffic. The routine operation of the reservoir would be conducted remotely from TIDs offsite office and would not result in a significant increase in TID employees.

The distance or vehicle mile traveled (VMT) to and from the site to deliver product to WCSG's customers in the region would not significantly change from the VMT associated with the previous Seaborn mining operations.

The Project would not include design features that would increase hazards on the public roads. The existing access road has been and would continue to provide adequate emergency access to and from the Project site.

Therefore, the Project would have no impact on transportation or traffic. Refer to the traffic report prepared by Associated Transportation Engineers (ATE) and the Vehicle Miles Travelled (VMT) analysis prepared by Sespe Consulting, Inc. (Sespe) to support the determination that there would be no impact related to transportation and/or traffic (Appendix I). Also see DEIR Section 3.17 – Transportation for additional detail.

1.8.9 Utilities and Service Systems

Under the Appendix G of the CEQA Guidelines category of "Utilities and Service Systems" a project is considered to have a significant impact on the environment if it would:

a) *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects (CEQA Appendix G Threshold (a))?*

b) *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years (CEQA Appendix G Threshold (b))?*

c) *Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments (CEQA Appendix G Threshold (c))?*

d) *Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructures, or otherwise impair the attainment of solid waste reduction goals (CEQA Appendix G Threshold (d))?*

e) *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste (CEQA Appendix G Threshold (e))?*

Because the production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. The Project would not result in an increase of onsite employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. An existing SCE electrical connection is located at the northern edge of the Project site to accommodate the onsite electrical needs of the Project. Therefore, the Project would not require the relocation or construction of new or expanded electric power or telecommunication facilities. The Project would not generate significant amount of waste that would exceed the capacity of the local landfills. Portable toilet facilities would be provided at the site and waste disposed of at an approved facility. The Project would not rely on existing storm water drainage systems nor would it require the construction of new or expanded storm water drainage systems. As discussed in Section 3.7 – Hydrology and Water Quality, the Project would have sufficient water supplies available to use for dust suppression during excavation, construction and operations.

Therefore, the Project would have no impact on utilities and services systems. Refer to DEIR Section 3.19 – Utilities and Service Systems for additional detail.

1.9 Potentially Significant Issues Analyzed in the Draft EIR

The following environmental issues have been identified as areas where the Project could potentially result in a significant impact and were therefore evaluated in the DEIR. The DEIR section number of each is identified in parentheses.

- Air Quality (3.3)
- Biological Resources (3.4)
- Cultural Resources (3.5)
- Geology and Soils (3.7)
- Greenhouse Gases Emissions (3.8)
- Hazards and Hazardous Materials (3.9)
- Hydrology and Water Quality (3.10)
- Land Use and Planning (3.11)
- Noise (3.13)
- Tribal Cultural Resources (3.18)
- Wildfire (3.20)

1.10 Project Alternatives

The CEQA Guidelines state that an EIR shall describe and analyze a range of reasonable alternatives to the proposed project. The guiding principles for the selection of alternatives for analysis in an EIR are provided in the CEQA Guidelines Section 15126.6. Pursuant to Section 15126.6(a):

> "An EIR shall describe *a range of reasonable alternatives to the project, or the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible."*

The following list is a summary of the key alternative provisions of the CEQA Guidelines Section 15126.6:

- The discussion of alternatives shall focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.
- The No-Project Alternative shall be evaluated, along with its impacts. The no-project analysis shall discuss the existing conditions at the time the notice of preparation was published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason"; therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.
- For alternative locations, only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

CEQA Guidelines Section 15126.6(f)(1) also allows the following factors to be taken into consideration when evaluating the feasibility of the alternatives:

- Site suitability;
- Economic viability;
- Availability of infrastructure;
- General Plan consistency;
- Other plan or regulatory limitations;
- Jurisdictional boundaries; and
- Whether the proponent can reasonably acquire, control or otherwise have access to the alternative site.

The alternatives that were considered but determined to be infeasible include the following:

- Alternative Location;
- Alternative Depth; and
- Alternative Size.

The alternatives that were considered for analysis include the following:

- No Project Alternative;
- Wet Excavation Method Alternative; and
- Clay Liner Installation Alternative.

A detailed discussion on the proposed alternatives to the Project as well as the alternatives that were considered but determined to be infeasible for the Project is provided in Section 4.0 – Alternatives to the Proposed Project.

1.11 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) specifies that:

> *"If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."*

The No Project Alternative is identified as the environmentally superior alternative. If this is the case, as stated above, it is also necessary to identify an environmentally superior alternative from among the other alternatives. However, as discussed in Section 4.0 – Alternatives, neither of the other alternatives would be environmentally superior to the Project. Please see Section 4.0 – Alternatives for additional detail.

1.12 Organization of the EIR

The DEIR is organized into the following sections:

Executive Summary: Summarizes the DEIR and is considered a standalone overview of the process and the Project. It includes a brief Project summary, Project objectives and benefits, description of the CEQA and other key regulatory processes, areas of controversy, issues to be resolved, the potentially significant environmental effects that may result from implementation of the Project, the Mitigation Measures identified to reduce or eliminate potentially significant effects, and a summary of alternatives to the Project.

Section 1.0 – Introduction: Provides an introduction and summary of the Project, the CEQA process and organization of the DEIR, the permits and entitlements required to implement the Project, and responsible agencies or County departments that would issue those permits and entitlements, areas of controversy, issues to be resolved, environment resources required to need or not need further evaluation in the EIR, the potentially significant environmental effects that may result from implementation of the Project, and a summary of alternatives to the Project.

Section 2.0 – Project Description: Provides a detailed description of the Project, including location and environmental setting, regulatory setting, Project purpose and objectives, and the Project phases and operations.

Section 3.0 – Environmental Impact Analysis: Describes the Project's characteristics related to each of the topical environmental issues and the threshold criteria used to evaluate potentially significant effects of the Project. Evaluates the potential environmental effects, identifies Mitigation Measures to reduce or eliminate effects found to be significant, and determines the level of significance of each effect after Mitigation Measures are implemented.

Section 4.0 – Alternatives to the Proposed Project: This section provides a summary comparison of the impacts of the Project with the identified Project alternatives. It includes the mandatory No Project Alternative, and an environmentally superior alternative.

Section 5.0 – Other CEQA Required Analysis: This section discusses cumulative impacts, growth inducing impacts, any significant and unavoidable adverse impacts that would remain after implementation of the Project, and significant irreversible environmental changes.

Section 6.0 – Report Preparation Resources and Organizations and Persons Consulted: This section lists the organizations which contributed to the preparation of the DEIR.

Section 7.0 – References: This section lists the references cited in the body of the DEIR.

Section 8.0 – Acronyms: This section lists the acronyms found in the body of the DEIR.

Appendices

A Scoping Process
- A-1 Scoping Comments, Mailing List, Presentation
- A-2 Notice of Preparation with Project Description
- A-3 Notice of Completion / Notice of Availability

B Reclamation Plan
- B-1 Surface Mining and Reclamation Plan (Sespe Consulting, Inc., 2023)

C Air Quality and Greenhouse Gases
- C-1 Air Quality, Health Risk, and Climate Change Impact Assessment (Sespe Consulting, Inc., 2021)

D Biological Resources
- D-1 McKay Point Reservoir – Biological Resources Report (Bumgardner Biological Consulting, 2013)
- D-2 McKay Point Reservoir – Biological Resources Report, Addendum No. 1 (Bumgardner Biological Consulting, 2021)
- D-3 Elderberry Inventory Report for the Proposed Reservoir of the Tulare County Irrigation District at McKay Point Near Visalia, California (Entomological Consulting Services, Ltd., 2014)

E Cultural/Paleontological Resources
- E-1 Cultural Resources Investigation for the McKay Point Reservoir Project (Applied EarthWorks, Inc., 2021)
- E-2 Paleontological Resource Assessment for the McKay Point Reservoir Project (Applied EarthWorks, Inc., 2014)
- E-3 Log of Native American Outreach

E-4 Addendum to Paleontological Resource Assessment for the McKay Point Reservoir Project (Applied EarthWorks, Inc., 2021)

F Geology and Soils

F-1 McKay Point Reservoir Project – Geology and Soils Technical Study (SLR Consulting Limited, 2015)

F-2 Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California (BSK Associates Engineering & Laboratories, 2011)

G Hydrology and Water Quality

G-1 McKay Point Reservoir Project – Hydrogeology and Water Quality Technical Study (SLR Consulting Limited, 2016)

H Noise

H-1 Noise Impact Assessment (Sespe Consulting, Inc., 2021)

I Traffic

I-1 Traffic Impact Assessment (ATE, 2021)

I-2 VMT Analysis (Sespe Consulting, Inc., 2022)

For those areas of potentially significant impacts, the sections of the DEIR generally use the following format:

- Topic Title and Introduction;
- Environmental Setting;
- Regulatory Setting;
- Significance Thresholds;
- Methodology of Analysis;
- Project-Level Impacts and Mitigation Measures; and
- Cumulative-Level Impacts and Mitigation Measures.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

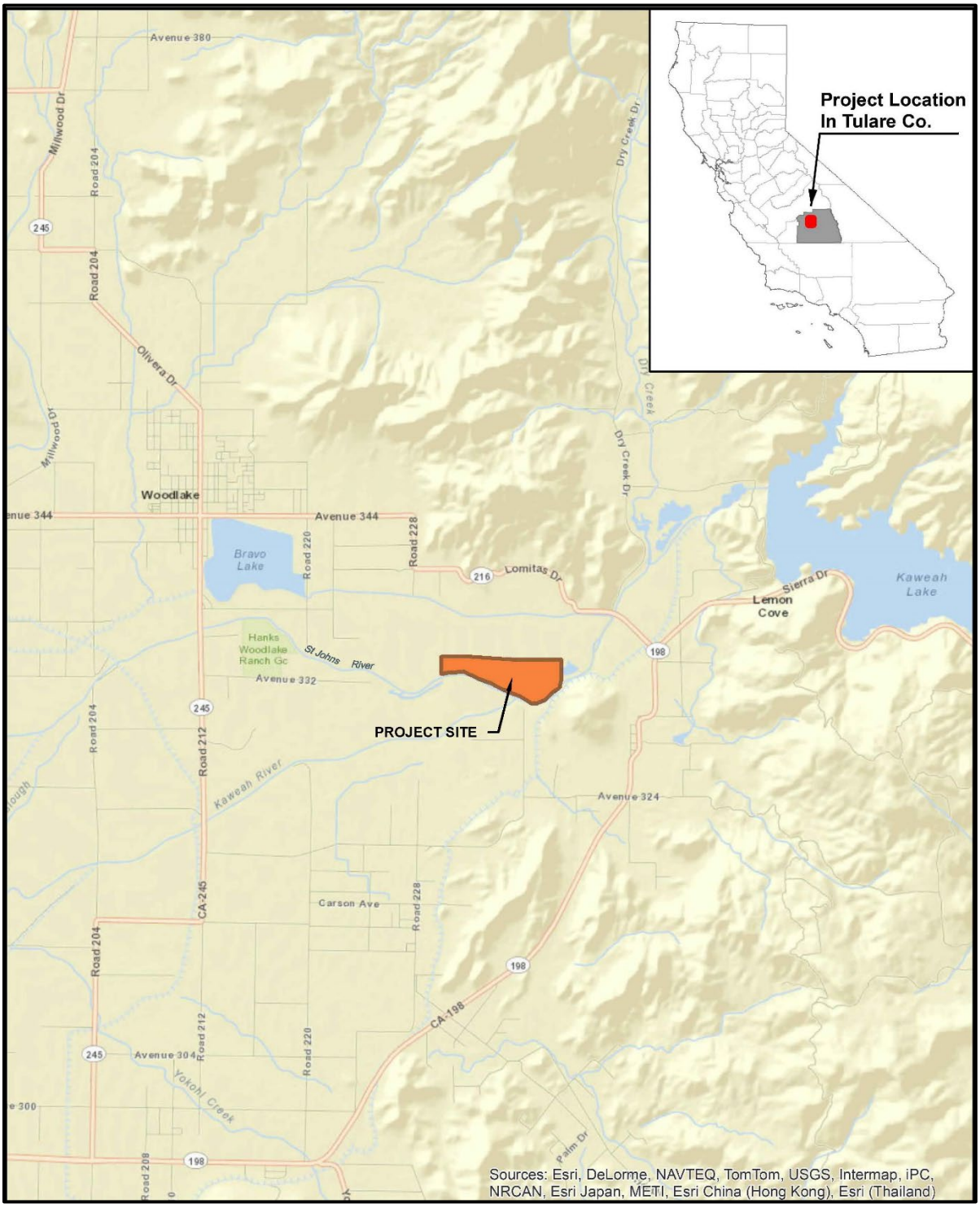
TID, the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, referred to as the McKay Point property. Together, the Owners are the holders of pre-1914 and post-1919 appropriative water rights on the Kaweah and/or the St. Johns Rivers, and they own storage capacity rights in Lake Kaweah formed by the impoundment of water behind the Terminus Dam.

TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah and St. Johns River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code.

The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River. The surrounding land uses are mining, agricultural, and residential (Figure 2-1 – Location Map, Figure 2-2 – Project Site and Surrounding Land Use Map).

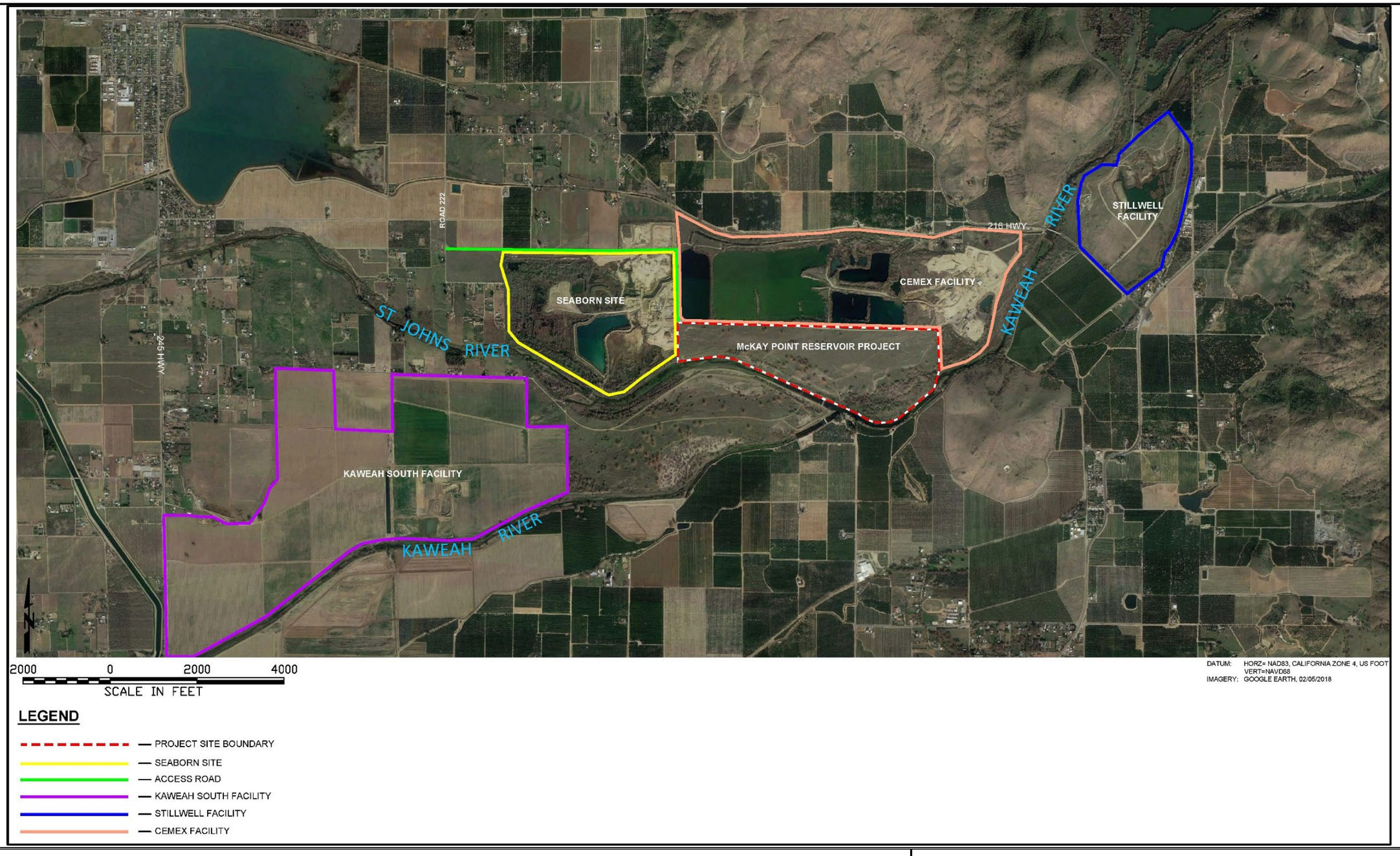
The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners intend to enter into a lease agreement with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage/re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

Discretionary approvals would be required for the Project; therefore, the Project is subject to the CEQA. TID is the Project applicant on behalf of the Owners and is the CEQA Lead Agency.



Source: Provost & Pritchard Consulting Group (October 2013)

Figure 2-1 Location Map



Source: Sespe Consulting, Inc. (October 2020)

Figure 2-2 Project Site and Land Use Map

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2.2 Project Objectives

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet at the proposed Project site.
- Deliver water to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCSG to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

Once the reservoir is constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.

2.3 Environmental Setting

2.3.1 Regional Setting

The Project site is located near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Project site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek, before draining into the Tulare Lake bottom near Corcoran.

The *Foothill Growth Management Plan Element* of the *Tulare County General Plan* (Tulare County, 2012) describes the area climate as typical of the foothill region, with cool rainy winters having a mean daily temperature ranging from 40° to 50° Fahrenheit (F) and hot dry summers where daytime temperatures can exceed 100° F.

During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the foothills. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and ranges from approximately 10 inches at the base to 25 inches at 3,000-feet. Most of this precipitation occurs between the months of November and April.

During daytime there is a dominant wind flow pattern from the northwest towards the Tehachapi Mountains. At night, this flow is reversed by winds that flow from the Sierra Mountains and foothill canyons.

Biological resources in the region have been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley oak and interior live oak on higher ground. Herbaceous wetland bottoms and upland native grassland communities were common in this vegetation mosaic. The extensive oak forests and riparian/wetland habitats hosted a diverse and abundant wildlife community. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation.

Currently in the foothills, the vegetation ranges from annual grasses in open areas to dense shrubs and trees. Much of the native vegetation in the area has been replaced by introduced species or has been eliminated by cultivation and overgrazing. Agriculture is currently the main land use in the region, although narrow strips of riparian vegetation grow along remnant tributaries.

2.3.2 Project Site Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately one (1.0) mile to the northeast of the Project site. The Kaweah River Rock and later the Santa Fe aggregate mining and processing facilities were located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately one (1.0) mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map). These figures illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural uses and, to a limited extent, for scattered rural residential purposes.

Most of the Project site is vegetated with non-native grasses, except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs. The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. The Project site topography is relatively level with a depression in the southeast corner. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The Project site elevation decreases from approximately 472-feet above mean sea level (amsl) on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end.

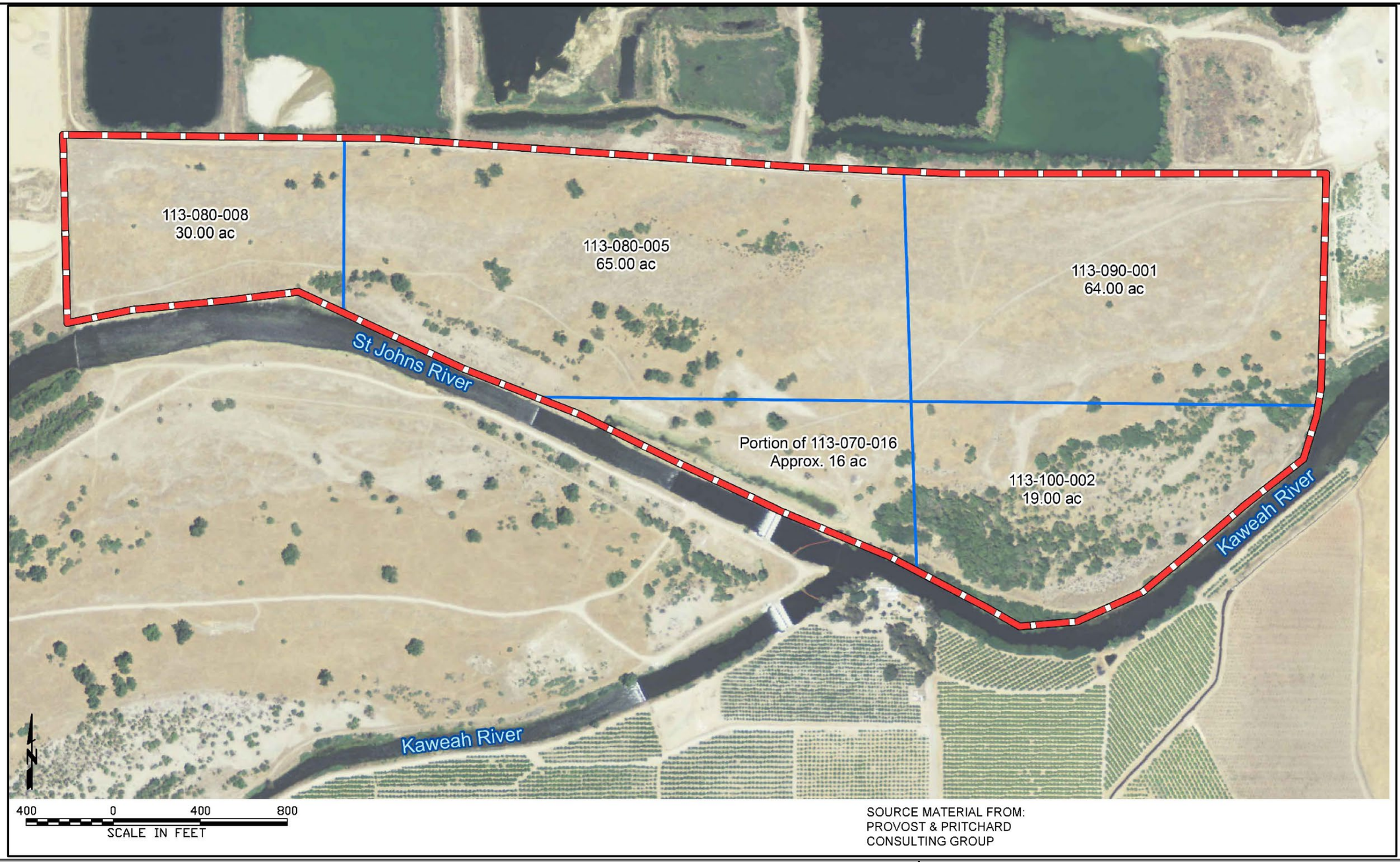
The long-term water-level measurements for wells in the area indicate a stability of groundwater levels, except for temporary declines during drought periods. Test borings within the Project site indicate depth to groundwater ranges from 20- to 7-feet below ground surface (bgs), with corresponding groundwater level elevations ranging from 438- to 459-feet amsl.

Table 2-1 lists the Assessor's Parcels occupied by the Project site and provides the parcel size, Tulare County General Plan Designation, Zoning, and Mineral Resources designation for each assessor's parcel numbers (APN). Figure 2-3 – Project Parcels, identifies where the parcels are located on the Project site.

Table 2-1. Assessor's Parcel Numbers, General Plan, Zoning and Mineral Resources

APN	APN Acres	Tulare County General Plan Land Use Designation	Zoning	Mineral Resources
113-070-016-000 (portion)	16.0	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area (MRZ-2b)
113-080-005-000	65.0	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area (MRZ-2b)
113-080-008-000	30.0	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area (MRZ-2b)
113-090-001-000	64.0	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area (MRZ-2b)
113-100-002-000	19.0	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area (MRZ-2b)

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Source: Provost & Pritchard Consulting Group (October 2013)

Figure 2-3 Project Parcels

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2.4 Regulatory Setting

TID is the Lead Agency for purposes of administering the requirements of the CEQA, and for preparing the Project EIR. TID is also the Project applicant on behalf of the Owners. The County is a Responsible Agency under CEQA.

Because WCSG would process material taken from the Project site during excavation of the reservoir as a marketable product (construction grade aggregate), TID would be required to comply with the Surface Mining and Reclamation Act (SMARA) and obtain the County's approval of a Surface Mining Permit, Reclamation Plan, and Financial Assurance Cost Estimate (FACE). The Tulare County Code and Zoning Ordinance states that a Special Use Permit would not be required in addition to the surface mining permit.

Other public agencies that may be involved in the permitting and/or approval of the Project include the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD), California Department of Fish and Wildlife (CDFW), the Central Valley Regional Water Quality Control District (CVRWQCD), the Department of Conservation (DOC)/Division of Mine Reclamation (DMR), the U.S. Army Corp of Engineers (Army Corp) and/or the U.S. Fish and Wildlife (USFW).

2.5 Reservoir Operations

2.5.1 Overview

The Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.

2.5.1.1 McKay Point Check Structures

The existing McKay Point Check Structures include the water control facilities owned and operated by the Kaweah Delta Water Conservation District and the Kaweah and St. Johns Rivers Association. The structures consist of two check structures, one on the St. Johns River and one on the Lower Kaweah River, each with nine automated gates. The structures can be operated such that the gates on the St. Johns River side can be raised, therefore shunting more flows down the Lower Kaweah River. Because CPDC, VKWC, and TID hold many of the rights to the waters of the Kaweah River system, water released from the reservoir and shunted into the Lower Kaweah River in this manner would serve CPDC and VKWC customer needs, as well as TID customer needs if necessary.

In a similar manner, the McKay Point Check Structures can be operated such that the gates on the Kaweah River side can be raised, therefore shunting more flows down the St. Johns River. Because TID holds rights to waters of the St. Johns River, water released via the outflow channel would serve TID customer needs.

2.5.1.2 Inflow Channel Management

The inflow and outflow channels would be constructed perpendicular to the Lower Kaweah River and St. Johns River respectively (Figure 2-4 – Final Reservoir Site Plan). The inflow channel would provide flow into the reservoir via a reinforced concrete control structure. The control structure would include an approach apron, reinforced concrete floor, a flow/level control gate, walls, and a deck on top of the structure. The bottom of the river channel and the banks of the inflow channel would be rip-rapped to prevent erosion.

To receive river water into the reservoir, the electrically operated weir on the inflow channel would be lowered. The water level in the Kaweah River can also be raised at the same time, by raising the gates at the McKay Point Check Structures. Water would flow by gravity into the reservoir up to a maximum flow rate of 500 cubic feet per second (cfs) via the inflow channel. Upon achieving water level equilibrium between reservoir and river, the electrically operated weir would be raised. As the level of the river recedes, either by the passing of the flood peak, or by lowering the gates on the McKay Point Check Structures, the electrically operated weir would serve to hold water in the reservoir.

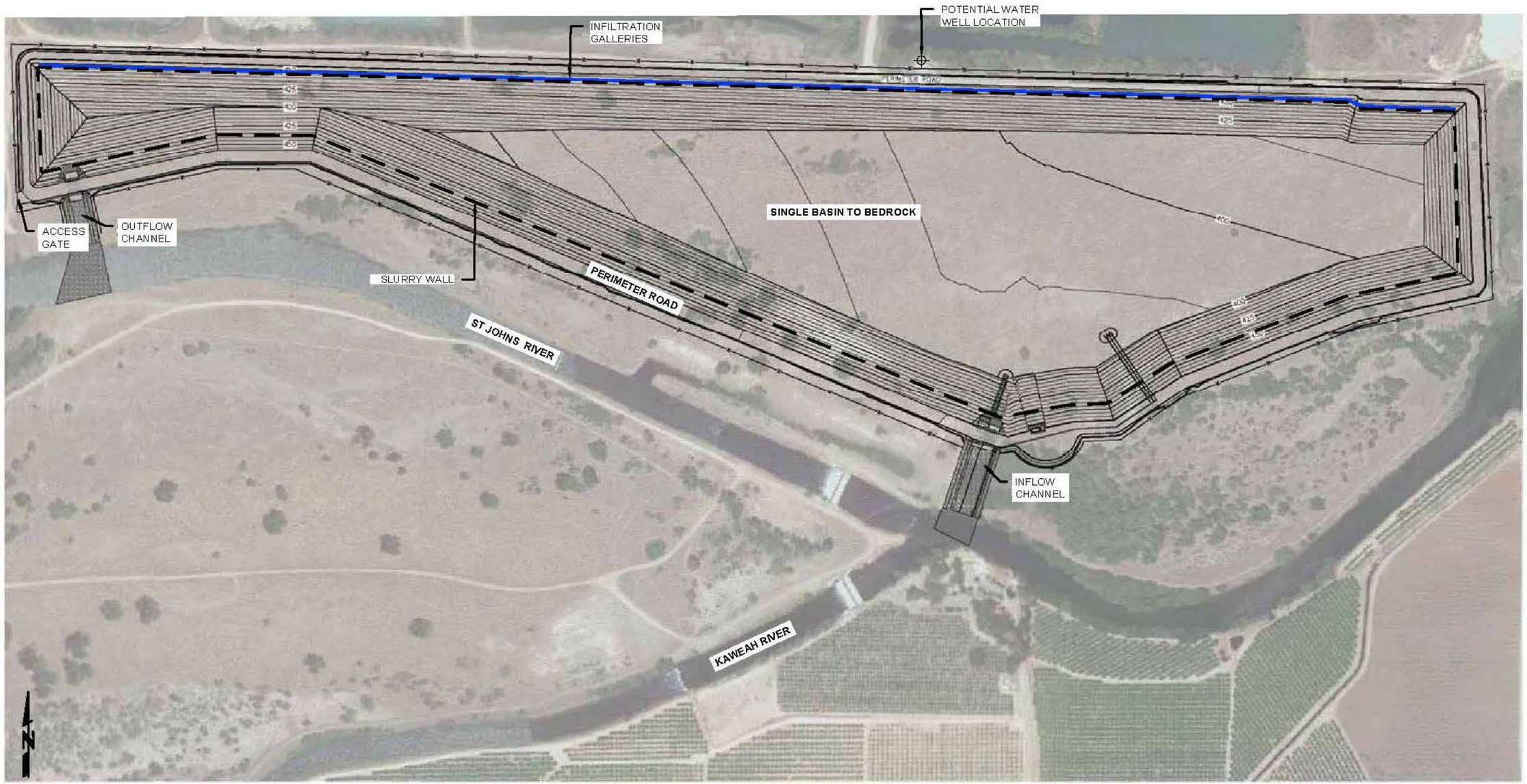
2.5.1.3 Outflow Channel Management

2.5.1.3.1 *Gravity-Flow Water Delivery into the St. Johns River and Kaweah River*

When the St. Johns River water level is lower than that of the reservoir, lowering the electrically operated weir on the outflow channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs. The average flow rate of return would approximate 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approaches the level of the outflow channel.

When the Kaweah River water level is lower than that of the reservoir, lowering the electrically operated weir on the inflow channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs. This would be done in concert with the raising of the St. Johns River control structure, since the inflow channel is upstream of the divergence of the St. Johns River from the Kaweah River. The average flow rate of return would approximate 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approached the level of the inflow channel.

The outflow channel would provide flow out of the reservoir via a reinforced concrete control structure. The control structure would include a reinforced concrete floor, flow/level control gate, walls, and a deck on top of the structure. The bottom of the river channel and the banks of the Outflow Channel would be rip-rapped to prevent erosion.



Source: Provost & Pritchard Consulting Group (October 2013)

Figure 2-4 Final Reservoir Site Plan

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The inflow channel could also be used in reverse as an outflow facility to deliver releases to the Kaweah River. When the Kaweah River water level is lower than that of the reservoir, lowering the electrically operated weir on the inflow channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs. The average flow rate of return would be approximately 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approached the level of the inflow channel.

Water delivery in this manner is limited by the amount of water being stored at a level higher than that of the inflow channel (i.e., approximately 15-feet of additional storage). Once the level of the reservoir falls below that of the inflow channel, the floating barge pump and its related piping would be used as described below.

2.5.1.3.2 *Pumped Water Delivery into the St. Johns River or Lower Kaweah River*

To release water to the St. Johns River or the Lower Kaweah River when the river water levels are higher than that of the reservoir, and the reservoir is lower than the Inflow or outflow channels, the water would be pumped from the reservoir, via an electrical or diesel pump, and conveyed into the Kaweah River, upstream of the McKay Point Check Structures. The pump, or series of pumps, would have an approximate maximum flow rate of 160 cfs. When this is done, the McKay Point Check Structures would be operated to direct flow into the St. Johns River or the Lower Kaweah River.

2.5.1.4 Supervisory Control and Data Acquisition

The electrically powered Supervisory Control and Data Acquisition (SCADA) equipment would be used to:

- Monitor Reservoir and river levels;
- Monitor and operate the inflow channel, outflow channel, and the electrically powered floating barge pump; and
- Monitor and coordinate with the automated gates of the McKay Point Check Structures with the Kaweah Delta Water Conservation District and the Kaweah and St. Johns River Association.

SCADA equipment would permit remote monitoring, control, and operations by TID operators from TID's offsite administration office in Tulare, California. In addition, TID operators would have the ability to set the control gates in either a condition of flow control or level control. In flow or level control, the gates would autonomously operate to maintain a desired flow, or a desired elevation, respectively, in the river channels.

2.5.1.5 Flood Control/Storm Water Management During Operations

The Project's water turnout facilities would allow the diversion of up to 500 cfs. With 4,600 acre-feet of total capacity, the reservoir could go from empty to full in just five days. This relatively short time span coincides with most of the local peak rain/flood events. The local peak rain/flood events are also of relatively short duration, with much of the flood water coming from the uncontrolled Dry Creek, which enters Kaweah River midway between the Project site and the Terminus Dam Reservoir (a distance of

approximately 1.1 miles upstream from the Project site). The ability to capture 500 cfs of floodwater is significant, considering that such a flow might otherwise impact the levees protecting the City of Visalia.

2.5.1.6 Re-regulation for More Efficient Water Utilization

When flood control releases are required from Lake Kaweah, or when Dry Creek or Yokohl Creek are running, water must be diverted to groundwater recharge basins or otherwise disposed. This is because there is reduced irrigation demand from the Owners' water users during periods of heavy rainfall. The Project would allow flood releases to be diverted and stored temporarily until the demand for irrigation water resumes or groundwater recharge facilities located downstream have capacity to receive more surface water. When diverted and stored, such water would be sold/delivered directly to irrigation users, thereby saving energy that might otherwise be consumed through pumping associated with groundwater recharge and subsequent recovery.

2.5.1.7 New Yield

The Project would have the ability to capture some of this floodwater, and it would be held in the reservoir until it can be safely returned to the Lower Kaweah River and St. Johns River for direct use or recharge. The reservoir could fill and empty multiple times during wet years when there is sufficient dry time to safely, effectively and beneficially return the water to the Lower Kaweah River and St. Johns River. Through this floodwater recapture it is estimated the Project could provide approximately 4,600 acre-feet per year of new water yield.

2.5.1.8 Water Management within the Reservoir

During long-term operations as a water management facility, it is intended that the reservoir remain relatively empty and void of local groundwater in order to provide maximum space to receive Kaweah River water as directed by the Owners. A slurry wall installed around inside perimeter of the reservoir, would minimize the groundwater inflows to approximately 500 gallons per minute (gpm). This would serve to keep the reservoir in a near dry condition when not being used for storage. If needed, de-watering would be conducted to maintain dry conditions. Seepage into the excavation would be captured at a designated location within the reservoir, and would then promptly be placed back into the aquifer via infiltration galleries located on the norther perimeter of Project site (Figure 2-4 – Final Reservoir Site Plan).

2.5.1.9 Operational Control

During Project operations and management, the Owners would have daily control over the reservoir and related facilities, which include the use of the SCADA equipment to monitor and control the facility remotely. TID staff would also perform routine onsite inspections to ensure the reservoir is operating properly.

2.5.1.10 Traffic During Operations

The routine operation of the Project would be conducted from TID’s offsite administration office in Tulare, California; therefore, the number of employees routinely driving to the site would be minimal, and primarily associated with routine maintenance operations.

2.5.1.11 Mobile Equipment Used During Operations

During the operations and maintenance of the reservoir, there would be limited equipment usage, but equipment could be needed to perform minor grading of the access road and to remove any debris that collects in the bottom of the reservoir. The following equipment could be used annually for maintenance operations:

- Grader
- Loader
- Diesel Aboveground Storage Tank (AST)
- Excavator
- Dump Truck
- Generators
- Backhoe

2.5.1.12 Onsite Hazardous Materials During Operations

An above ground storage tank (AST) approximately 10,000 gallons, diesel generators, and a generator building near the inflow chute would be used during operations. The diesel generators would provide power to the floating pump station. The Owners are currently evaluating the cost-effectiveness of a direct power supply from a power company and other options for power. These activities would be done in compliance with the requirements of a Hazardous Materials Business Plan (HMBP), Storm Water Pollution Prevention Plan (SWPPP), Spill Prevention, Control, and Countermeasure (SPCC) Plan and with the hazardous waste generator and AST regulations as described in Section 3.9 – Hazards and Hazardous Materials of the EIR.

2.5.1.13 Utilities During Operations

Electrical power would be provided by Southern California Edison (SCE) from an existing power lines located along the north perimeter of the Project.

2.5.1.14 Lighting During Operations

Except for the security lighting, no nighttime lighting is proposed and/or required.

2.5.1.15 Administration, Security, and Public Safety During Operations

The perimeter of the reservoir site would be fenced and all facilities secured. Random and frequent visits from Owners staff would provide added security. The routine operation and administration of the Project would be conducted from TID's offsite administration office in Tulare, California.

2.6 Project Phases

Prior to the operational phase of the Project, the site must be prepared. The preparation of the site includes the excavation of a pit with sufficient capacity to meet the Project needs for water storage. After the pit has been prepared, the reservoir would be constructed. Therefore, the Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and, operation of the reservoir. The operation of the McKay Point Reservoir is described above in Section 2.5. The following sections discuss the phases of the Project that are required to construct the reservoir.

2.6.1 Reservoir Excavation

In order to construct the reservoir, the site must be excavated to a depth and surface area that meet the Project's water storage capacity requirements. This would be done by WCSG. WCSG would likely begin the reservoir excavation in the western portion of the Project site and would progress eastward. The excavated area would result in an open pit with a surface area of approximately 110 acres and a depth of approximately 60 feet bgs. Final slopes are anticipated to be approximately 3H:1V (horizontal:vertical) in order to minimize any bank erosion from the wind and water. Because the excavated material would be excavated and processed onsite and then sold as a marketable product, the County considers the excavation and processing activities being conducted on the Project site subject to SMARA requirements for surface mining. Therefore, all activities associated with the reservoir excavation would be conducted in accordance with SMARA requirements (Figure 2-4 – Final Reservoir Site Plan and Figure 2-5 – Project Excavation Site Plan).

Overburden is the material located above the aggregate. Initial testing indicates that the overburden would be between 6- to 12-feet deep, comprised primarily of very sandy material (60 to 80 percent) in the top 20-feet. Below 20-feet, the material is comprised largely of gravel (40 percent) and sand (40 to 48 percent), and lesser amounts of silts and clays (12 to 20 percent).

Excavation is expected to proceed at an approximate rate of 920,000 gross tons per year but could vary based on market demand. The excavation and storage of aggregate would be coordinated with WCSG such that the maximum production rate historically achieved at the adjacent Seaborn site would not be exceeded. Once processed, approximately 70 percent of the excavated materials would be of marketable quality, which is referred to as net tons. This means a year's excavation of 920,000 gross tons would produce approximately 650,000 net tons of marketable construction-grade aggregate. The total amount of aggregate excavated during this phase of the Project is approximately 16.5 million tons (gross) and approximately 11.55 million tons (net).

Table 2-2 provides the total gross and net tons of aggregate extracted during the excavation phase as well as the acreage that would be disturbed by the excavation. Figure 2-4 and Figure 2-5 shows the final excavation/reservoir site plan and contours.

Table 2-2. Excavation Phase Summary

Gross Tons	Net Tons [1, 2]	Area (acres)
16.5 million	11.55 million	110

1 Net tons are the marketable construction-grade aggregate derived through processing. Net tons equate to approximately 70 percent of the gross tons processed.

2 11 million cubic yards * 1.5 ton/cubic yard = 16.5 million gross tons
(13.8 million tons – 9.66 million tons)/13.8 million tons = 30% fines & 70% product
16.5 million tons * 0.7 = 11.55 million net tons product

2.6.1.1 Excavated Materials

Excavated materials would be processed on the Project site by WCSG using a portable wash/screen plant. The wash/screen plant would wash and screen the excavated material to appropriate sizes in order to meet WCSG customers' requirements. Approximately 70 percent of the excavated material is expected to be PCC-grade aggregate which can be used as aggregate and in aggregate-containing products, such as concrete and asphalt. If needed, WCSG would bring a portable crush/recycle plant on site to break up oversized pieces of rock prior to screening in the processing/wash plant. The crush/recycle plant could also be used to recycle used concrete and asphalt brought in from offsite. WCSG may also import materials to be blended with the aggregate if required by their customers (Figure 2-5 – Project Excavation Site Plan).

Aggregate mining and processing activities have been conducted at the adjacent Seaborn site since the late 1940's. The Seaborn site is also owned by TID and Consolidated Peoples Ditch Company. The WCSG production rate of the Project's excavated aggregate would not exceed the historical aggregate processing production rate (baseline) from what was being done at the adjacent Seaborn site. The baseline was obtained from actual production records and was determined to be an average of 500,000 tons per year (TPY) and a maximum of 650,000 TPY. Therefore, the number of on-road haul trucks transporting the material offsite on public roads to WCSG's customers would not result in an increase of the baseline number of on-road haul trucks.

The overburden and excess fines resulting from the excavation of the reservoir would be stored on the Project site for use in backfilling the pit walls to a safe slope as required by SMARA, constructing the perimeter road and other auxiliary construction activities. The remainder of the fines could be sold by WCSG as slurry used in nonstructural concrete or as miscellaneous fill material, as WCSG has done in the past with overburden and fines resulting from their mining activities.

The transportation of all materials brought to or taken from the site, including the processed aggregate, recyclable used concrete, exported fines, and imported materials for blending with the aggregate, would be managed such that the total number of on-road haul trucks per day would not be above the baseline. ATE prepared an evaluation of the offsite traffic on public roads which is provided in Appendix I.

2.6.1.2 Slurry Wall

Slurry walls are below-grade walls that restrict groundwater flow or support excavations and structures, using soil-bentonite or cement-bentonite. A slurry wall would be installed early during the excavation phase of the Project to slow or eliminate groundwater from flowing into the pit during excavation and construction phases and to maintain an evacuated state as part of the long-term operations (i.e., a full reservoir has limited water re-regulation value).

The slurry wall would be a permanent fixture of the reservoir facility and would serve as an essential feature to maintain dewatered storage space to receive water diversions by the Owners. The dewatering flows would be minimized to approximately 500 gpm during reservoir facility construction and long-term reservoir operation.

Slurry wall construction consists of clearing and grubbing approximately 26 acres, excavating approximately 109,000 cubic yards of native soil, and poring of the slurry wall into the excavated trench. Approximately 4,000 dry tons of bentonite and 56,000 tons of silty/clay fines would be delivered to the site for use in the slurry wall. Construction slurry consisting of a bentonite-water slurry would be pumped into the trench to hold the sides of the trench open during the construction of the slurry wall. A mixture of bentonite, silty/clay fines and native soil would be used for the final slurry wall. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the slurry wall.

2.6.1.3 Water Use and Management During Reservoir Excavation

Because the groundwater table on the Project site is at a depth of 7- to 20-feet below the ground surface, a slurry wall would be constructed around the inside perimeter of the pit. This would maintain the pit in a relatively dry condition such that dry mining methods could be used. If there is some groundwater seepage or accumulation of stormwater, the water would be pump from the pit and stored for use as dust control or recirculated in infiltration galleries. The infiltration galleries would be located along the northern perimeter of the pit outside of the slurry wall. The infiltration galleries would consist of appropriately designed ditches that are covered with granular materials allowing water to percolate back to groundwater.

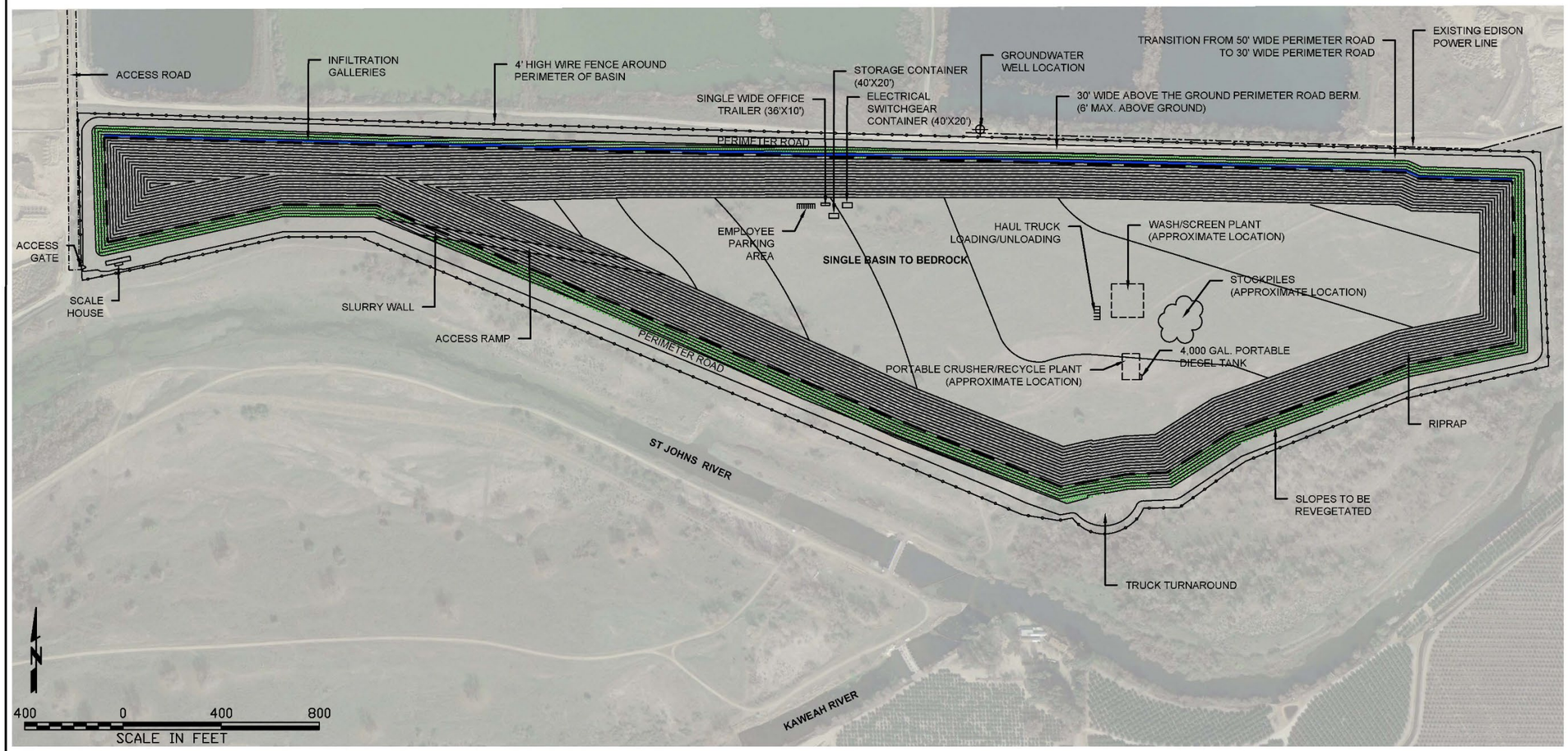
The primary use of water at the Project site would be to control fugitive dust. The water would be obtained either by pumping it from the pit or drawn from an onsite groundwater well. Total water consumption during excavation activities would average 3.5 million gallons per year (i.e., approximately 11 acre-feet per year).

2.6.1.4 Days and Hours of Operation and Employment During Reservoir Excavation

Approximately 7 to 12 employees would be required during the excavation of the reservoir site. Excavation would occur between 4:00 a.m. (or dawn if later) and 6:00 p.m., Monday through Saturday, and continue until the desired depth and extent of excavation achieves reservoir design.

2.6.1.5 On-Road Haul Truck Traffic During Reservoir Excavation

Excavated and processed materials would be loaded directly on to on-road haul trucks within the Project site. Once loaded, the on-road haul trucks would exit the Project site via the privately owned access road on the Seaborn site (owned by TID and CPDC) which connects to Road 222. From there the material would be transported to WCSG's customers via public roads. The number of on-road haul trucks on public roads associated with WCSG's sale of the processed material would not increase from the baseline level of on-road truck traffic (160 trips per day). The number of on-road haul trucks carrying the processed aggregate as well as the number of on-road trucks needed for the transport of other materials (recycled concrete and asphalt, excess fines, blending materials) being exported or imported to or from the site would not be allowed to exceed the baseline production rate from the previous operations at the Seaborn site (average of 500,000 TPY and a maximum of 650,000 TPY). A copy of the traffic report is provided in Appendix I.



NOTES:

a. EXCAVATION PIT WILL HAVE A FINAL DEPTH OF 60-FEET BELOW GROUND SURFACE, WITH A TOTAL SURFACE AREA OF APPROXIMATELY 110 ACRES. PIT SLOPES WILL NOT EXCEED 3H:1V (HORIZONTAL TO VERTICAL).

b. EARLY IN THE EXCAVATION PHASE, A SLURRY WALL WILL BE INSTALLED AROUND THE PERIMETER OF THE PIT TO PREVENT GROUNDWATER INTRUSION.

c. THE LOCATIONS OF THE WASH/SCREEN PLANT, PORTABLE CRUSH/RECYCLE PLANT, AND ASSOCIATED MATERIAL STOCKPILES ARE APPROXIMATE. THESE WILL BE RELOCATED WITHIN THE EXCAVATION AREA AS MINING PROGRESSES.

d. THERE ARE NO EXISTING ONSITE DRAINAGE OR WATER FEATURES THAT WOULD BE DISTURBED BY EXCAVATION/RECLAMATION ACTIVITIES.

e. SLOPES LOCATED ABOVE THE SLURRY WALL/HIGH-WATER LINE WILL BE VEGETATED TO CONTROL EROSION

f. RIPRAP WILL BE PLACED ON PIT SLOPE AREAS BELOW THE SLURRY WALL TO MINIMIZE EROSION.

g. THERE ARE NO EXISTING PUBLIC ROADS, RAILROADS, OR WATER WELLS WITHIN 500-FEET OF THE SITE.

h. EXISTING SOUTHERN CALIFORNIA EDISON (SCE) POWER LINES RUN ALONG THE NORTHERN PERIMETER OF THE SITE. THE PROPOSED WASH/SCREEN PLANT WILL CONNECT TO THESE EXISTING UTILITIES. NO OTHER UTILITIES (GAS TELEPHONE, WATER, ETC.) EXISTING WITHIN 500-FEET OF THE SITE.

i. DUST WILL BE CONTROLLED THROUGHOUT THE SITE/ON UNPAVED ROADS USING A MOBILE WATER TRUCK.

SOURCE MATERIAL FROM: PROVOST & PRITCHARD CONSULTING GROUP (2021)

DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/08/2018

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MCKAY POINT RESERVOIR
PROJECT EXCAVATION SITE PLAN

FIGURE NUMBER

DRAWN BY: G.CAMUS
CHECKED BY: GS
DATE: FEBRUARY 2021

S:\TU01-Tulare Irrigation District\CAD\TU01-Tulare Irrigation District_2-5_03-02-21.dwg Jul 13, 2021, 8:16am GJC

Source: Sespe Consulting, Inc. (July 2021)

Figure 2-5 Project Excavation Site Plan

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The excavation phase of the Project would require only 7 to 12 onsite employees. This would be consistent with the baseline number of employees previously required during the mining and processing activities at the Seaborn site. For evaluation purposes, it is assumed that each employee would make 2 trips per day (inbound and outbound). This would result in a maximum of 24 trips (12 in-bound, 12 out-bound) on peak days, assuming all 12 employees are onsite as compared to the 35 employee trips per day during mining and processing activities at the Seaborn site. As a result, the Project would generate only nominal traffic on public roadways, which would not result in a significant increase from baseline operations at the Seaborn site (see Traffic Analysis provided in Appendix I).

Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site (Figure 2-5 – Project Excavation Site Plan).

Note that a single-way trip is referred to as a "trip" and a round trip (going from the WCSG facility to their customers and the return trip by the on-road truck back to the facility) is referred to as a "load" (two one-way trips).

2.6.1.6 Portable Equipment Used During Reservoir Excavation

The equipment used during the excavation of the site would include:

- Excavator
- Off-road Haul Trucks
- Bulldozer
- Loader
- Portable Generator
- Grader
- Water Truck
- Scraper
- Backhoe
- Pneumatic Pumps

In addition, a portable processing/wash plant and a portable crush/recycle plant would be used on the Project site. The plants would move from west to east along with the excavation of the aggregate.

2.6.1.7 Onsite Hazardous Materials During Reservoir Excavation

During excavation, there would be no significant quantities of hazardous materials stored on the Project site. If fueling by use of mobile fuel trucks and/or minor maintenance were to occur onsite, these activities would be subject to and done in compliance with the requirements of the site-specific SWPPP and in compliance with the hazardous material and waste generator regulations under California Code of Regulations (CCR) Title 22.

2.6.1.8 Lighting During Excavation

The excavation phase of the Project would occur primarily during daylight hours (between dawn and 6:00 p.m.), and therefore the use of nighttime lighting is not anticipated. However, if onsite activities take place during the time of year when daylight hours are shorter, some lighting may be required to provide a safe working environment. In the event of the need for nighttime lighting, high pressure sodium and/or cut-off fixtures (or equivalent International Dark-Sky Association [IDA]-approved fixtures) would be used and

the lighting would also be designed to confine illumination to the Project site and/or to areas that do not include light-sensitive uses.

2.6.1.9 Administration, Security, and Public Safety During Reservoir Excavation

Security personnel would monitor the Project site during nighttime and during the weekends. The perimeter of the excavation site would be fenced and all facilities secured. Administration activities would be conducted from the TID offsite admonition office in Tulare, CA.

2.6.2 Reservoir Facility Construction

Construction of the reservoir would create a storage capacity of approximately 4,600 acre-feet, and would include the following components illustrated in Figure 2-4 – Final Reservoir Plan:

- Inflow channel – 500 cfs capacity.
- Electrically operated weir for the Inflow Channel control.
- Inflow chute.
- Energy dissipation pool – Based upon the drilling logs, it is expected bedrock would be encountered at the proposed final elevation. However, if the excavation does not get down to bedrock, installation of an energy dissipation pool at the base of the Inflow Chute would prevent the potential scouring effects of the water entering the reservoir.
- Floating barge pump – 160 cfs capacity to deliver into the Kaweah River upstream of the existing McKay Point Check Structures.
- A 10,000 gallon above-ground diesel tank, generators and generator building.
- Floating barge pump discharge piping.
- Outflow Channel – up to 900 cfs capacity gravity flow into the St. Johns River.
- Electrically operated weir for the outflow channel control.
- Slurry wall to minimize groundwater seepage into/out of the reservoir (constructed during the excavation phase).
- Perimeter fencing and access gates.
- Perimeter berm, perimeter road and truck turnaround (the inflow and outflow channels will pass under the perimeter road in concrete structures).

The inflow and outflow structures would require excavation and grading to prepare the site for installation. Inflow/outflow grading would consist of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards, and the placement of approximately 9,000 cubic yards of rip-rap. Construction of the in/outflow building would consist of finish grading and minor excavation of approximately 600 cubic yards and the placement of approximately 1,100 cubic yards of concrete.

The Department of Water Resources (DWR), Division of Safety of Dams has jurisdiction over projects that create a dam over 25-feet in height or will have an impounding capacity of 50 acre-feet or more (Water Code Section 6002). However, artificial barriers less than 6-feet in height, or that have a storage capacity of less than 15 acre-feet are not considered dams subject to DWR jurisdiction (Water Code Sections 6003, 6025). The retention of water within the reservoir would be below grade and would not require the use of artificial barriers greater than 6-feet in height. Therefore, the Project does not exceed these criteria and is not regulated as a dam. The excavation of the pit for the construction of the reservoir would meet the engineering and safety requirements as set forth in SMARA.

2.6.2.1 Days and Hours of Operation and Employment During Construction

Approximately 7 to 12 employees would be required during the construction of the reservoir facilities, which would occur between 4:00 a.m., or dawn if later, and 6:00 p.m., Monday through Saturday, until completed. Nighttime construction activities are not anticipated.

2.6.2.2 Traffic During Construction

The Project would only require 7 to 12 employees during the construction of the reservoir; therefore, the number of employees traveling to the site would be minimal and consistent with the baseline number of employees previously required during the mining activities at the Seaborn site. Each employee is assumed to make 2 trips per day (inbound and outbound), which would result in a maximum increase of 24 trips on peak days, assuming all 12 employees are onsite. Access for reservoir facility construction employees and service vehicles would be via Road 222, through the existing Seaborn site entrance to the Project site. As a result, the Project would generate only nominal traffic on public roadways, which would be comparable to that being experienced during the Seaborn site mining and processing operations (see Traffic Analysis located in Appendix I).

2.6.2.3 Mobile Equipment Used During Construction

The equipment used for the construction of the reservoir facilities, such as inlet and outlet features, includes:

- Excavator
- Backhoe
- Water Truck
- Grader
- Loader
- Compactor
- Cement Trucks
- Pneumatic Pumps
- Cranes
- Trenchers
- Portable Generators
- Bulldozer

2.6.2.4 Onsite Hazardous Materials During Construction

During construction, there would not be significant quantities of hazardous materials stored on the Project site. If fueling by use of mobile fuel trucks and minor maintenance were to occur onsite, these activities would be subject to and done in compliance with the requirements of the site-specific SWPPP and in compliance with applicable hazardous material and hazardous waste generator regulations.

2.6.2.5 Utilities During Construction

Electrical power would be provided by SCE from existing power lines located along the north perimeter of the Project.

2.6.2.6 Lighting During Construction

The construction phase of the Project would occur primarily during daylight hours (between dawn and 6:00 p.m.), and therefore the use of nighttime lighting is not anticipated. However, if onsite activities take place during the time of year when daylight hours are shorter, some lighting may be required to provide a safe working environment. In the event of the need for nighttime lighting, high pressure sodium and/or cut-off fixtures (or equivalent IDA-approved fixtures) would be used and the lighting would also be designed to confine illumination to the Project site and/or to areas that do not include light-sensitive uses.

2.6.2.7 Administration, Security, and Public Safety During Construction

Security personnel would monitor the Project site during the weekends and at night. The perimeter of the excavation site would be fenced and all facilities secured. Administration activities would be conducted at the TID offsite administration office in Tulare, CA

2.7 Reclamation Plan

As discussed above, because the excavated material taken from the Project site would be sold as a marketable product, the excavation phase of the Project would require a Surface Mining Permit and the preparation and County approval of a Reclamation Plan in accordance with the requirements of SMARA and the Tulare County Zoning Ordinance, Chapter 25 (Surface and Mining Reclamation). Section 7-25-1085 of the County Ordinance Code (Permit) states as follows:

> *Except as provided in sections 7-25-1090 and 7-25-1095 of this Article, any person who proposes to engage in surface mining operations within the unincorporated area of Tulare County shall, prior to the commencement of such operations, obtain a permit to mine, approval of a reclamation plan and approval of financial assurances in accordance with the provisions of this Chapter*, *the Act and the regulations.* (emphasis added)

A Reclamation Plan was prepared for review and comment by the Division of Mine Reclamation (DMR), and review and approval by the County as the SMARA Lead Agency. The Reclamation Plan was developed in compliance with the reclamation standards set forth in SMARA Regulations (14 CCR Sections 3700 to 3713). The identified end use of the excavation is the creation of the McKay Point Reservoir to be used as a surface water storage/re-regulation reservoir. The reservoir can also be used to optimize groundwater recharge within the Owners service areas.

3.1 AESTHETICS

3.1.1 Introduction

This section of the DEIR presents a discussion of the existing visual environment in the proposed Project vicinity using accepted methodology to evaluate aesthetic/visual landscape quality and light/glare.

3.1.2 Environmental Setting

3.1.2.1 Regional and Local Setting

The Project site is located near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Project site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek, before draining into the Tulare Lake bottom near Corcoran.

Biological resources in the region have been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley oak and interior live oak on higher ground. Herbaceous wetland bottoms and upland native grassland communities were common. The extensive oak forests and riparian/wetland habitats hosted a diverse and abundant wildlife community. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation.

The Project site and surrounding areas have historically been used for agriculture, including cattle grazing. Specifically, the Project site has historically been used for cattle grazing. Because of the existence of high-quality aggregate in the alluvial soils in the area of the Project site there are also aggregate mining operations and processing facilities adjacent to the Project and throughout the immediate area. Figure 2-2 in Section 2.0 – Project Description illustrates how adjacent lands to the north, northeast, southwest, and west are either currently being or have been used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural uses and, to a limited extent, for scattered rural residential purposes.

3.1.3 Regulatory Setting

3.1.3.1 Federal

There are no direct Federal regulations applicable to the Project with respect to aesthetics. However, the U.S. Bureau of Land Management (BLM) has developed the Visual Resources Management (VRM) System to objectively rate the quality of visual resources and evaluate changes in scenic quality attributed to a proposed change in land use.

3.1.3.2 State

Title 24 Outdoor Lighting Standards

Title 24 Outdoor Lighting Standards were adopted by the State of California Energy Commission (Commission) (Title 24, Parts 1 and 6, Building Energy Efficiency Standards (Standards) on April 23, 2008,

and went into effect on January 1, 2010. The changes included new requirements for outdoor lighting, which vary according to the "Lighting Zone" district in which the equipment is located. A Light Zone 2 designation is by default for all "rural areas" as defined by the U.S. Census Bureau; these are generally locations of low lighting ambient illumination (Tulare County, 2012). Approved existing outdoor lighting systems in rural areas prior to the adoption of the 2008 Standards update, are not required to meet the Building Energy Efficiency Standards for lighting allowances in the Lighting Zone 2 district.

State Scenic Highway Program

The State of California officially designates State scenic highways through the "California Scenic Highway Program," which is managed by Caltrans. A highway may be designated "scenic" depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. In addition, highways may be identified as "candidate," pending official designation. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et. seq. A list of state scenic highways is found in Street and Highway Code, Section 263 (Caltrans, 2011).

There are no candidate or designated State Scenic Highways located within the immediate vicinity of the Project site. In Tulare County, portions of State Routes (SR) 190, 198, and 180 are eligible for state scenic highway designation; however, these highway corridors have not been officially designated as State Scenic Highways. The California Scenic Highway Mapping System notes that State Highway 198 is an Eligible State Scenic Highway – Not Officially Designated. State Highway 198 passes to the southeast of the Project where intervening terrain would preclude any view of the Project. State Highway 216, which has no State Scenic Highway status, passes north of the Project and is 0.7 miles from the Project at its closest point.

3.1.3.3 Local

County Scenic Roadways

Tulare County's existing General Plan identifies State designated scenic highways and County designated eligible highways. There are three highway segments designated as eligible by the State. These include State Route 198 from Visalia to Three Rivers, State Route 190 from Porterville to Ponderosa, and State Route 180 extending through Federal land in the northern portion of Tulare County. State Route 198 closely follows around Lake Kaweah and the Kaweah River, while State Route 190 follows around Lake Success and the Tule River. Both Scenic Highways travel through agricultural areas of the valley floor to the foothills and the Sierra Nevada Range. Additionally, the General Plan Update identifies preserving the rural agricultural character of SR 99 and SR 65 as valuable to the County and communities (Tulare County, 2012).

Tulare County General Plan Policies

The Tulare County General Plan has several policies that apply to projects within the County of Tulare. General Plan policies that potentially relate to the proposed Project are listed below.

> ***SL-1.1 Natural Landscapes:*** *During review of discretionary approvals, including parcel and subdivision maps, the County shall as appropriate, require new development to not significantly*

impact or block views of Tulare County's natural landscapes. To this end, the County may require new development to:

1. *Be sited to minimize obstruction of views from public lands and rights-of-ways,*
2. *Be designed to reduce visual prominence by keeping development below ridge lines, using regionally familiar architectural forms, materials, and colors that blend structures into the landscape,*
3. *Screen parking areas from view,*
4. *Including landscaping that screens the development,*
5. *Limit the impact of new roadways and grading on natural settings, and*
6. *Include signage that is compatible and in character with the location and building design.*

SL-1.2 Working Landscapes: *The County shall require that new non-agricultural structures and infrastructure located in or adjacent to croplands, orchards, vineyards, and open rangelands be sited so as to not obstruct important viewsheds and to be designed to reflect unique relationships with the landscape by:*

1. *Referencing traditional agricultural building forms and materials,*
2. *Screening and breaking up parking and paving with landscaping, and*
3. *Minimizing light pollution and bright signage.*

SL-2.1 Designated Scenic Routes and Highways: *The County shall protect views of natural and working landscapes along the County's highways and roads by maintaining a designated system of County scenic routes and State scenic highways by:*

1. *Requiring development within existing eligible State scenic highway corridors to adhere to land use and design standards and guidelines required by the State Scenic Highway Program,*
2. *Supporting and encouraging citizen initiatives working for formal designation of eligible segments of State Highway 198 and State Highway 190 as State scenic highways,*
3. *Formalizing a system of County scenic routes throughout the County and,*
4. *Requiring development located within County scenic route corridors to adhere to local design\guidelines and standards.*

LU-7.6 Screening: *The County shall require landscaping to adequately screen new industrial uses to minimize visual impacts.*

LU-7.14 Contextual and Compatible Design: *The County shall ensure that new development respects Tulare County's heritage by requiring that development respond to its context, be compatible with the traditions and character of each community, and develop in an orderly fashion which is compatible with the scale of surrounding structures.*

LU-7.19 Minimize Lighting Impacts: *The County shall ensure that lighting in residential areas and along County roadways shall be designed to prevent artificial lighting from reflecting into adjacent natural or open space areas unless required for public safety.*

3.1.4 Significance Thresholds

Appendix G of the CEQA Guidelines contains a checklist of environmental effects that may be considered significant. Under the category of "Aesthetics," a project is considered to have a significant visual impact on the environment if it would:

a) Have a substantial adverse effect on a scenic vista;

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or

d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

3.1.5 Methodology of Analysis

The analysis presented in this section is based on review of applicable Federal, State and local requirements, Project design features, best management practices (BMPs), operating practices, and other environmental protection measures that have been incorporated into the Project to minimize potential impacts on the environment. Generally speaking, projects that create a high level of contrast to the existing visual character of a project setting are more likely to generate adverse impacts due to visual incompatibility. Conversely, projects that create a low level of contrast to the existing visual character are less likely to generate adverse impacts due to inherent visual compatibility.

The following points were considered in this evaluation:

- No excavation of material would take place within thirty (30) to fifty (50) feet from adjacent property lines (see Figure 2-5 in Section 2.0 – Project Description).
- Operations would occur primarily during daylight hours. Operations during the time of year when daylight hours are shorter, or for any evening/nighttime operations, would require lighting to provide a safe operating environment. For evening/nighttime lighting, high pressure sodium and/or cut-off fixtures (or equivalent International Dark Sky Association (IDA)-approved fixtures) would be used instead of mercury-vapor fixtures for any required evening/nighttime lighting of the mining operations. The lighting would also be designed to confine illumination to the Project site, and/or to areas that do not include light-sensitive uses.

3.1.6 Project-Level Impacts and Mitigation Measures

3.1.6.1 Substantial Adverse Effect on a Scenic Vista

Impact Statement

Impact AE-1: *Have a substantial adverse effect on a scenic vista?* **(Appendix G Threshold Criteria (a))**

Impact Analysis

The Project is adjacent to the Kaweah and St. Johns Rivers. The Project is set back from the rivers' banks and the Project would not involve any large above-grade structures that would be visible from the rivers. Because dry mining techniques would be used during the Project excavation phase, there would be no need for draglines that could have an adverse impact on the views from the rivers. Mining operations located adjacent to or in the area surrounding the Project site have been in existence since the 1940s. Therefore, the Project would not change the visual character of the area, nor would it have a substantial adverse effect on scenic vistas surrounding the Project site from nearby roadways or the river, and impacts are considered less than significant with no mitigation required.

Level of Significance before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.1.6.2 Substantial Damage Scenic Resources within a Scenic Highway

Impact Statement

Impact AE-2: *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?* **(Appendix G Threshold Criteria (b))**

Impact Analysis

As stated above, the California Scenic Highway Mapping System notes that State Highway 198 is an Eligible State Scenic Highway – Not Officially Designated. State Highway 198 passes to the southeast of the Project where intervening terrain would preclude any view of the Project. State Highway 216, which has no State Scenic Highway status, passes north of the Project and is 0.7 miles from the Project at its closest point. Therefore, the Project will not substantially damage scenic resources within a State scenic highway and will result in a less than significant impact.

Level of Significance before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.1.6.3 Substantial Degrade the Existing Visual Character/Quality of the Site/Surroundings

Impact Statement

Impact AE-3: *In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?* **(Appendix G Threshold Criteria (c))**

Impact Analysis

As discussed above, the Project is located in a rural area of unincorporated Tulare County, adjacent to the Kaweah and St. Johns Rivers. The Project is set back from the river's banks and the Project would not involve any large above-grade structures that would be visible from the river. Because dry mining techniques would be used during the Project excavation phase, there would be no need for draglines that could have an adverse impact on the views from the rivers. Mining operations located adjacent to or in the area surrounding the Project site have been in existence since the 1940s; therefore, the Project would not change the visual character of the area, would not obstruct the view of nearby mountains, or conflict with any applicable policies or plans meant to protect scenic resources. Therefore, impacts are considered less than significant with no mitigation required.

Level of Significance before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.1.6.4 Create New Sources of Light or Glares that would Affect Views

Impact Statement

Impact AE-4: *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?* **(Appendix G Threshold Criteria (d))**

Impact Analysis

The issue of light and glare is typically associated with excessively bright nighttime lighting that crosses over property lines (i.e., "light trespass") and illuminates offsite yards or bedroom windows. It is also associated with the condition that occurs when excessive nighttime lighting creates a "skyglow" effect. The excavation and construction phases of the Project would occur primarily during daylight hours (between dawn and 6:00 p.m.). Activities taking place during the time of year when daylight hours are shorter, some lighting may be required to provide a safe working environment. If nighttime lighting is required, high pressure sodium and/or cut-off fixtures (or equivalent International Dark-Sky Association [IDA]-approved fixtures) would be used and the lighting would also be designed to confine illumination to the Project site and/or to areas that do not include light-sensitive uses. Except for security lighting, no nighttime lighting would be required during the Project operations phase.

By employing minimal evening lighting fixtures and utilizing the proposed lighting and design features (i.e., downcast lights, high pressure sodium and/or cut-off fixtures, etc.), the Project would have a less than significant impact associated with light and glare with no mitigation required.

Level of Significance before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.1.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3.0-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to aesthetic resources.

As noted in Table 3.0-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with visual or aesthetic resources. Additionally, as discussed in Section 3.1.6 above, CEQA Guidelines Thresholds *a)* through *d)* were determined to have a less than significant impact in terms of the Project's potential effects on visual resources. Since the Project would present no significant impacts related to aesthetics, there would be no cumulative impact in conjunction with the other cumulative projects.

3.2 AGRICULTURE AND FORESTRY RESOURCES

3.2.1 Introduction

This section of the DEIR presents a discussion of agricultural land and forestry resources. A review of potential Project impacts is provided in the following analysis.

3.2.2 Environmental Setting

3.2.2.1 Regional and Local Setting

Tulare County is located in a geographically diverse are of California encompassing approximately 4,840 square miles of classified lands (lands with identified uses) and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and a mountain region just east of the foothills. The eastern half of the County is generally comprised of public lands, including the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. Federal lands, which include wilderness, national forests, monuments and parks, along with County parks, make up 52% of the County. Agricultural uses, which include row crops, orchards, dairies, and grazing lands on the Valley floor and in the foothills total over 2,020 square miles or about 43% of the entire County. Urban uses such as incorporated cities, communities, hamlets, other unincorporated urban uses, and infrastructure rights-of-way make up the remaining land in the County.

The Project site and surrounding areas have historically been used for agriculture, including cattle grazing. Specifically, the Project site has historically been used for cattle grazing. The California Resources Agency, Division of Land Resource Protection maintains information pertaining to, and the mapping of, farmland. According to the Farmland Mapping and Monitoring Program (FMMP), the entire Project site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing of livestock." Therefore, the Project would convert existing agriculture land (i.e., grazing land) to a non-agricultural use. However, the Project site is not located on land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance and would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural use.

Because of the existence of high-quality aggregate in the alluvial soils in the area of the Project site there are other aggregate mining operations and processing facilities adjacent to the Project and throughout the immediate area.

3.2.3 Regulatory Setting

3.2.3.1 Federal

Farmland Protection Policy Act (FPPA)

The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures

to implement the FPPA every two years. The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land (USDA, 2022).

U.S. Forest Service

The U.S. Department of Agriculture (USDA) Forest Service is a federal agency that manages public lands in national forests and grasslands. The Forest Service is also the largest forestry research organization in the world and provides technical and financial assistance to state and private forestry agencies.

3.2.3.2 State

California Department of Conservation: Farmland Mapping and Monitoring Program

The California Department of Conservation (DOC), under the Division of Land Resource Protection, has developed the Farmland Mapping and Monitoring Program (FMMP), which monitors the conversion of the state's farmland to and from agricultural use. Data is collected at the county level to produce a series of maps identifying eight land use classifications using a minimum mapping unit of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of state agricultural land and updates the "Important Farmland Series Maps" every two years (Tulare County, 2012).

The map series identifies eight classifications, as defined below, and uses a minimum mapping unit size of 10 acres.

- Prime Farmland has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
- Unique Farmland consists of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the 4 years prior to the mapping date.
- Farmland of Local Importance is land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- Grazing Land is land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University

of California Cooperative Extension, and other groups interested in the extent of grazing activities.

- Urban and Built-up Land is occupied by structures with a building density of at least one unit to 1.5 acre, or approximately six structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, prisons, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures.
- Water is defined as perennial water bodies with an extent of at least 40 acres.
- Other Land is land not included in any other mapping category. Common examples include low density rural developments, vegetative and riparian areas not suitable for livestock grazing, confined animal agriculture facilities, strip mines, borrow pits, and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land. More detailed data on these uses is available in counties containing the Rural Land Use Mapping categories. (DOC, 2022)

Williamson Act: California Land Conservation Act of 1965

The California Land Conservation Act (CLCA) of 1965, Sections 51200 et seq. of the California Government Code, commonly referred to as the "Williamson Act", enables local governments to restrict the use of specific parcels of land to agricultural or related open space use. Landowners enter into contracts with participating cities and counties and agree to restrict their land to agriculture or open space use for a minimum of ten years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market (speculative) value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971.

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE's mission emphasizes the management and protection of California's natural resources; a goal that is accomplished through ongoing assessment and study of the State's natural resources and an extensive CAL FIRE Resource Management Program. CAL FIRE oversees enforcement of California's forest practice regulations, which guide timber harvesting on private lands. Reviews and inspections ensure protection of watershed and wildlife, as well as renewal of timber resources. Department foresters and fire personnel work closely to encourage and implement fuels management projects to reduce the threat of uncontrolled wildfires. CAL FIRE Foresters promote conservation and the importance of our trees and forests to Californians of all ages. CAL FIRE manages eight Demonstration State Forests that provide for commercial timber production, public recreation, and research and demonstration of good forest management practices. Additional forestry programs include urban forestry, archaeology, pest management, etc. (CAL FIRE, 2022).

3.2.3.3 Local

County of Tulare General Plan

The Tulare County General Plan has policies that apply to projects within Tulare County that serve to protect farmland. General Plan policies that are potentially applicable to the proposed Project are listed below:

> ***AG-1.3 Williamson Act:*** *The County should promote the use of the California Land Conservation Act (Williamson Act) on all agricultural lands throughout the County located outside established Urban Development Boundaries (UDBs). However, this policy carries with it a caveat that support for the Williamson Act as a tax reduction component is premised on continued funding of the State subvention program that offsets the loss of property taxes.*
>
> ***AG-2.11 Energy Production:*** *The County shall encourage and support the development of new agricultural related industries featuring alternative energy, utilization of agricultural waste, and solar or wind farms.*

3.2.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Agriculture and Forestry Resources" a project is considered to have a significant impact on the environment if it would:

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use (CEQA Appendix G Threshold (a))?*

b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract (CEQA Appendix G Threshold (b))?*

c) *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) (CEQA Appendix G Threshold (c))?*

d) *Result in the loss of forest land or conversion of forest land to non-forest use (CEQA Appendix G Threshold (d))?*

e) *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use (CEQA Appendix G Threshold (e))?*

3.2.5 Methodology of Analysis

The following points were considered in the Agriculture and Forestry Resources evaluation:

- Historically, the site has experienced only marginal agricultural use in the form of seasonal livestock grazing. The entire Project site is designated as Grazing Land per the FMMP, which, among other definitions, includes "*land on which the existing vegetation is suited to the grazing of livestock.*" As discussed above, the Project site is not located on Prime Farmland, Unique

Farmland, or Farmland of Statewide or Local Importance. As such, the Project would have no impact on any category of important farmland. The Project site is not currently being utilized as a farming operation to cultivate or grow crops. In addition, the underlying land is not under a Williamson Act contract.

- The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- In identifying the area underlying the Project site as MRZ-2b, the State of California and the County General Plan have determined this area contains mineral deposits where geologic data show that significant measured or indicated resources are present, or where geologic information indicates that significant inferred resources are present. Land included in the MRZ-2b category is of prime importance because it contains known economic mineral deposits. A typical MRZ-2b area would include an operating mine, or an area where extensive sampling indicates the presence of a significant mineral deposit. This site is also designated by the State as having aggregate deposits of regional significance.

3.2.6 Project-Level Impacts and Mitigation Measures

3.2.6.1 Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland)

Impact Statement

Impact AG-1: *Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

The California Resources Agency, Division of Land Resource Protection maintains information pertaining to, and the mapping of, farmland. Historically, the site has been used for cattle grazing. The entire Project site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing." The Project site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract. As such, the Project would have no impact on agriculture or forestlands.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.2.6.2 Conflict With Zoning for Agricultural Use, or a Williamson Act Contract

Impact Statement

Impact AG-2: *Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

Table 3.11-2 in Section 3.11 – Land Use and Planning, provides a consistency analysis of the applicable Tulare County General Plan policies.

As stated above, historically the site has been used for cattle grazing, and the entire Project site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing." The Project site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract.

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20-Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). Within the AE-20 zone, the County permits mining and the extraction of minerals, upon approval of a Reclamation Plan and Financial Assurance Cost Estimate (FACE).

The Project would also not result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965, or Farmland Security Zone Contract pursuant to Public Resources Code § 15206(b)(3). Therefore, the Project would have no impact on agriculture or forestlands.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.2.6.3 Conflict With Zoning for Forest Land/Timberland

Impact Statement

Impact AG-3: *Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?* **(CEQA Guidelines – Appendix G Threshold Criteria (c))**

Impact Analysis

The Project site and surrounding areas are located in the Valley portion of Tulare County and have agricultural zoning. The area contains no lands zoned or identified as forest land or timberland. The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20-Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). Within the AE-20 zone, the County permits mining and the extraction of minerals, upon approval of a Reclamation Plan and Financial Assurance Cost Estimate (FACE). Therefore, the proposed Project will not conflict with existing zoning for forest land or cause rezoning of forest land, and no impacts would occur.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.2.6.4 Loss Of Forest Land or Conversion of Forest Land to Non-Forest Use

Impact Statement

Impact AG-4: *Would the Project result in the loss of forest land or conversion of forest land to non-forest use?* **(CEQA Guidelines – Appendix G Threshold Criteria (d))**

Impact Analysis

As discussed in 3.2.6.3, the proposed Project is not located within a forestland zone or would require the change of a forestland zone. As such, no impacts would occur.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.2.6.5 Conversion of Farmland, to Non-Agricultural Use or Non-Forest Use

Impact Statement

Impact AG-5: *Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?* **(CEQA Guidelines – Appendix G Threshold Criteria (e))**

Impact Analysis

As stated above, historically the site has been used for cattle grazing, and the entire Project site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing." The Project site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract.

As previously discussed above, the proposed Project is not located within a forestland zone or will require the change of a forestland zone. The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20-Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). Within the AE-20 zone, the County permits mining and the extraction of minerals, upon approval of a Reclamation Plan and Financial Assurance Cost Estimate (FACE).

There are no forestlands on or near the Project site. The Project would also not result in the cancellation of an open space contract made pursuant to the California Land Conservation Act of 1965, or Farmland Security Zone Contract pursuant to Public Resources Code § 15206(b)(3).

For these reasons, the Project would have no impact on agriculture or forestlands, or result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.2.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3.0-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to agriculture and forestry resources.

As discussed in this Section, historically the Project site has been used for cattle grazing. The Project site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract. The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20-Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b), and the Project is consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies that pertain to agricultural and forest resources. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to agriculture and forestry resources.

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3.3 AIR QUALITY

3.3.1 Introduction

This section of the DEIR evaluates the potential impacts associated with Toxic Air Contaminant (TAC) and criteria pollutant emissions as a result of the Project. The air quality analysis is based on the Air Quality, Health Risk, and Climate Change Impact Assessment (AQCCIA) provided in Appendix C. The AQCCIA presents technical information and analysis describing reasonably foreseeable changes to the environment and potential impacts that would occur with the Project. The AQCCIA was prepared using current best practices including the Guidance for Assessing and Mitigating Air Quality Impacts (SJVAPCD, 2015) and the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015).

Both the state and the federal government have established health-based criteria called Ambient Air Quality Standards (AAQS) for six air pollutants, referred to as criteria pollutants. The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter ($PM_{2.5}$ and PM_{10}). Potential impacts associated with criteria pollutants are evaluated by comparing the quantified emissions to SJVACPD thresholds of significance. Toxic air contaminants (TACs) are also regulated and potential impacts associated with TACs are assessed by using health risk assessment (HRA) methods in accordance with San Joaquin Valley Air Pollution Control District (SJVAPCD) guidelines and the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015). The health effects of these pollutants are described in detail in the AQCCIA. The regulatory status both criteria pollutants and TACs are discussed in Section 3.3.3.

3.3.2 Environmental Setting

The environmental setting includes the physical setting against which changes that would occur with the Project are compared in order to determine the Project's impact. The environmental setting also includes factors that influence the setting such as meteorology, geography, and the locations of emission sources and receptors. Frequency and severity of high pollutant concentrations in the air as well result in adverse health effects which are also part of the physical setting and the primary reason for regulating air pollutants. Air quality standards are set at levels that will protect health, including the health of sensitive populations, such as school age children or hospitalized individuals.

3.3.2.1 Regional Setting

The Project site is located in the San Joaquin Valley (Valley) within the central portion of the San Joaquin Valley Air Basin (SJVAB) under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD or District). The SJVAPCD describes the SJVAB as follows:

The SJVAB consists of a continuous inter-mountain valley approximately 250 miles long and averaging 80 miles wide. On the western edge is the Coast Mountain range, with peaks reaching 5,020 feet, and on the east side of the valley is the Sierra Nevada range with some peaks exceeding 14,000 feet. The Tehachapi Mountains form the southern boundary of the valley. This mountain range includes peaks over 6,000 feet, and contains mountain passes to the Los Angeles basin and the Mojave Desert.

The SJVAB has an "inland Mediterranean" climate, which is characterized by hot, dry summers and cool, rainy winters… Precipitation in the SJVAB is confined primarily to the winter months with some occurring in late fall and early spring. Nearly 90 percent of the annual precipitation in the SJVAB falls between the months of November through April. Average annual rainfall for the entire SJVAB is about 10 inches on the valley floor. (SJVAPCD, 2003)

According to Western Regional Climate Center (WRCC), the Lemon Cove Station (044890) located within 1 mile from the Project site, is the nearest climatological monitoring station. Based on the period of record (1/1/1899 to 6/10/2016), average monthly temperature has ranged from a minimum of 36.9° Fahrenheit (F) to a maximum of 99.3° F. December and January are typically the coldest months with July and August the warmest (WRCC, 2016). The annual rainfall totals approximately 14.4 inches and mostly occurs between November and April (WRCC, 2016). Summer rainfall is minimal and generally limited to scattered thundershowers over the Sierra Nevada Mountain range. The Air Quality Report utilized SJVAPCD processed meteorological data from the Visalia Airport for modeling purposes.

SJVAPCD, together with the California Air Resources Board (CARB), maintains ambient air quality monitoring stations in the Tulare County area. Data collected at permanent monitoring stations are used by the United States Environmental Protection Agency (US EPA) and the State to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS or State AAQS). The federal and state attainment status in Tulare County area, including the SJVAB is shown in Table 3.3-1.

Table 3.3-1. San Joaquin Valley Air Basin Federal and State Attainment Status

Pollutant	Federal Designation [a]	State Designation [b]
Ozone - One hour	No Federal Standard [f]	Nonattainment/Severe
Ozone - Eight hour	Nonattainment/Extreme [e]	Nonattainment
PM_{10}	Attainment [c]	Nonattainment
$PM_{2.5}$	Nonattainment [d]	Nonattainment
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment/Unclassified	Attainment
Sulfur Dioxide (SO_2)	Attainment/Unclassified	Attainment
Lead (Particulate)[h] (Pb)	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride [h]	No Federal Standard	Attainment

Source: San Joaquin Valley Unified APCD (SJVAPCD, 2020)

a. See Code of Regulations (CFR) 40 CFR, Part 81.
b. See California Code of Regulations (CCR) Title 17 Sections 60200-60210.
c. On September 25, 2008, the EPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.

d. The Valley is designated nonattainment for the 1997 federal $PM_{2.5}$ standards. The EPA released final designations for the 2006 $PM_{2.5}$ standards in December 2008 (effective in 2009), designating the Valley as nonattainment for the 2006 $PM_{2.5}$ standards.
e. Though the SJVAB was initially classified as "nonattainment/Serious" for the 1997 8-hour ozone standard, the EPA approved a reclassification to "extreme nonattainment" on May 5, 2010 (effective June 4, 2010).
f. Effective June 15, 2005, the EPA revoked the federal 1-hour ozone standard, including associated designations and classifications. However, the EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

3.3.2.2 Local Setting

The Project site is approximately 200 acres located adjacent to where the Lower Kaweah River and St. Johns River diverge. The Project is approximately 1.0 mile northwest of the community of Lemon Cove and west of the intersection of State Routes 198 and 216 in Tulare County, California. Mining activities have historically and currently been conducted adjacent to or in the vicinity of the Project site, specifically at the adjacent Seaborn site, the CEMEX Lemon Cove facility located immediately north of the Project site, and the Kaweah South Facility located approximately 0.5 miles southwest of the Project site.

The closest ambient air quality monitoring station to the Project site is the Visalia station. This station is located approximately 13.6 miles west-southwest of the Project site and measures O_3, PM_{10}, and $PM_{2.5}$. The station is constructed to monitor at a "neighborhood scale", defined by the EPA as a station covering an area between 0.5 and 4.0 square kilometers in range. Air quality at the Project site is expected to be better than air quality at the Visalia monitoring station because the monitoring station is located within an urban area where there are more emissions sources. The Project site and surrounding lands are characterized as rural with few air emissions sources and so one would expect fewer hot spots and/or near field exposures as compared to more urban areas where there are many sources and where ambient measurements are collected. Regional pollutant (e.g., ozone and $PM_{2.5}$) concentrations measured at the Visalia station conservatively represent concentrations on-site because these amounts are added to Project concentrations and cumulative concentration is compared to the AAQS in order to determine the Project's impact.

Ambient concentrations and number of days when the primary air quality standards were exceeded are presented in Table 3.3-2 and Table 3.3-3. Carbon monoxide and sulfur dioxide are not presented in these tables because the pollutants are not currently monitored within Tulare County and concentrations measured at all monitoring stations within SJVAB have been less than state or federal standards over the past five years. Ozone (O_3) levels exceeded the state one-hour and eight-hour standards and the federal eight-hour standard in each of the past five years. PM_{10} levels exceeded only the state standard in the last five years. $PM_{2.5}$ levels exceeded the federal standard for the past five years. A summary of all ambient air quality standards is presented in Table 3.3-2.

Table 3.3-2. Ambient Air Quality in the Project Area

Concentration and Averaging Period	Ambient Air Quality Standard	2015	2016	2017	2018	2019
Ozone 1-hr	0.09 ppm (State, max.)	0.110	0.098	0.109	0.112	0.093
Ozone 8-hr	0.070 ppm (State, max.)	0.079	0.080	0.083	0.085	0.084

Concentration and Averaging Period	Ambient Air Quality Standard	2015	2016	2017	2018	2019
	0.070 ppm (Fed., 4th high)	0.091	0.083	0.092	0.095	0.082
NO_2 1-hr	0.18 ppm (State, max.)	0.0623	0.0575	0.0581	0.0692	0.0707
	0.100 ppm (Fed., 98th %ile)	0.0456	0.0459	0.0556	0.0529	0.055
NO_2 Annual	0.030 ppm (State) 0.053 ppm (Fed.)	0.009	NA	0.010	0.010	0.009
PM_{10} 24-hr	50 µg/m^3 (State, max.)	140.3	132.5	145.7	159.6	418.5
	150 µg/m^3 (Fed., 2nd high)	67.3	137.1	144.8	153.4	411.1
PM_{10} Annual	20 µg/m^3 (State)	NA	NA	46.9	52.0	46.3
$PM_{2.5}$ 24-hr	35 µg/m^3 (Fed., 98th %ile)	45.8	40.7	74.6	63.4	45.5
$PM_{2.5}$ Annual	12 µg/m^3 (State, max.)	NA	15.5	16.8	17.4	12.2
	12.0 µg/m^3 (Fed., 3 Yr Avg.)	17.6	16.2	15.7	16.1	15.5

*Data Not Available

Source: Trends Summary for O_3, PM_{10}, $PM_{2.5}$ and Top 4 Summary for NO_2. (CARB, 2020).

Max. = Maximum. Hr = Hour. Fed. = Federal. ppm = parts per million. µg/m3 = micrograms per cubic meter.

4th high = Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.

2nd high = Not to be exceeded more than once per year on average over 3 years.

98th %ile = 98th percentile of: 1-hour daily maximum concentrations for the 1-hr NO_2 NAAQS; and of 24-hour average concentrations for PM_{10} and $PM_{2.5}$, averaged over 3 years.

Non Detectible (ND) – insufficient data available to determine. NA – data are not available from the listed sources.

Carbon monoxide and sulfur dioxide are not presented in these tables because the pollutants are not currently monitored within Tulare County and concentrations measured at all monitoring stations within the Air Basin have been less than State or federal standards over the past five years.

Table 3.3-3. Number of Days Exceeding Air Quality Standards

Monitoring Site	Year	Days Exceeding State 1-Hour O_3	Days Exceeding State 8-Hour O_3	Days Exceeding Federal 8-Hour O_3	Days Exceeding State 24-Hour PM_{10}[a]	Days Exceeding Federal 24-Hour $PM_{2.5}$[a]
Visalia	2015	9	52	49	59.4	ND
	2016	1	19	18	68.8	ND
	2017	9	65	61	89.3	135.9
	2018	8	58	53	94.0	164.4
	2019	0	26	22	ND	115.8

Source: Trends Summary (CARB, 2020).

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and 3 days, respectively. "Numbers of days exceeding the standards" are mathematical estimates.

ND – insufficient data available to determine.

3.3.2.3 Health Effects Setting

The level of air pollution historically existing in the Project area is considered the baseline for this air quality assessment. Therefore, the emissions associated with the mining activities at the adjacent Seaborn site are the baseline emissions. For more information, see Section 3.3.5.3.

3.3.3 Regulatory Setting

The following is a summary of the key regulatory plans and policies that may apply to the Project. A more detailed discussion is provided in the AQCCIA located in Appendix C.

3.3.3.1 Federal

Clean Air Act

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Congress established much of the basic structure of the CAA in 1970, and made major revisions in 1977 and 1990. "The Clean Air Act in a Nutshell: How It Works" (EPA, 2013) contains a thorough yet concise summary of how US EPA implements the CAA which includes the following information presented in Table 3.3-4.

Table 3.3-4. Applicability of US EPA Activities under the CAA to the Project

US EPA Activity	Applicable to Project Sources?
Establish air quality standards.	Yes, see Impact AQ-1.
Designate quality of air in attainment areas.	No, the Project is not an attainment area.
Administrate state implementation plans.	No, the Project is not a SIP.
Require additional programs in nonattainment areas.	Yes, the Project would comply with SJVAPCD programs and rules that address nonattainment.
Provide guidance on control techniques.	No, the Project would employ standard controls.
Regulate interstate air pollution.	No, the Project is not a state.
Require plans to maintain clean air after a nonattainment area meets the standard.	Yes, the Project would comply with SJVAPCD programs and rules that maintain attainment.
Preserve clean air in attainment areas.	Yes, the Project would comply with SJVAPCD programs and rules that preserve attainment.
Adopt National standards for new stationary sources.	Yes, new stationary sources at the Project that have an applicable New Source Performance Standard (NSPS) are discussed in this subchapter.
Adopt National standards or guidelines for consumer and commercial products.	No, the Project does not buy products that emit air pollutant from vendors outside the country.
Adopt National standards for new vehicles and engines, and fuels.	No, the Project does not manufacture vehicles, engines, or fuels.
Regulate emissions from oil drilling on the Outer Continental Shelf.	No, the Project is not located on the Outer Continental Shelf.
Regulate hazardous air pollutants.	Yes, the Project is subject to the NESHAP for engines as discussed in this subchapter.
Protect visibility in National parks by regulating regional haze.	No, the Project is approximately 10 miles from the boundary of Sequoia National Park but does not include a major stationary source.
Control acid rain by regulating NO_2 and SO_2 emissions from power plants.	No, the Project does not include a power plant or other major source of combustion pollutants.
Protect stratospheric ozone by regulating ozone-depleting compounds (e.g., chlorofluorocarbons).	No, the Project would purchase refrigerants and other classes of products from a U.S. vendor.

US EPA Activity	Applicable to Project Sources?
Regulate major sources of air pollution by administrating a Federal operating permit program.	No, the Project is a minor source that does not require a Federal operating permit.

Ambient Air Quality Standards

Both the state and the federal government have established health-based criteria called Ambient Air Quality Standards (AAQS) for the following six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter ($PM_{2.5}$ and PM_{10}). Each of the criteria pollutants are described in detail in the AQCCIA (see Appendix C). The regulatory status of the criteria pollutants within the SJVAPCD and AAQS which are presented Table 3.3-5.

Table 3.3-5. State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3) [8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10}) [9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$) [9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemi-luminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectro-photometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1,300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[10]	—	
Lead [12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Visibility Reducing Particles [14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride [12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: CARB, May 4, 2016 (updated Dec 2020)
https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the US EPA for further clarification and current National policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method, which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard, may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
6. Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the US EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the US EPA.
8. On October 1, 2015, the National 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the National annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing National 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour National standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the National 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the National 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the National standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour National standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 National standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour National standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To

directly compare the 1-hour National standard to the California standard the units can be converted to ppm. In this case, the National standard of 75 ppb is identical to 0.075 ppm.

12. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The National standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

New Source Performance Standards – Title 40, Code of Federal Regulations (CFR), Part 60

Subpart OOO (Nonmetallic Mineral Processing Plants)

This regulation is applicable to new, modified, or reconstructed nonmetallic mineral processing facilities (with certain exceptions, such as fixed sand and gravel plants and crushed stone plants with capacities of 25 tons per hour or less, or portable sand and gravel plants and crushed stone plants with capacities of 150 tons per hour or less). Subpart OOO restricts emissions from affected facilities equipped with capture systems used to capture and transport particulate matter to a control device. Emissions are prohibited in excess of 0.032 grams per dry standard cubic meter (g/dscm) (0.014 grains per dry standard cubic feet [g/dscf]), and from exhibiting visible emissions based on quarterly monitoring. Subpart OOO also prohibits the discharge of any fugitive emissions from affected facilities without capture systems and the discharge of fugitive emissions escaping capture systems that exhibit greater than 7% opacity (12% for crushers without capture systems).

Subpart IIII (Stationary Compression Ignition Internal Combustion Engines)

This regulation is applicable to new, modified, or reconstructed stationary engines and would apply to the generators. However, the requirements would be superseded by application of the best available control technology (BACT) which will be more stringent.

Regulations Affecting New Diesel Engines

US EPA regulates emissions from new non-road (i.e., off-road, portable, and stationary) internal combustion engines by tiered standards (e.g., compression-ignition engines in 40 CFR 89.112, 40 CFR 1039.101, and 40 CFR 1039.102). Emissions from new non-road engines are regulated using standards that apply by model year, class of vehicle, and fuel type (e.g., heavy-heavy duty diesel engines in 40 CFR 86.004-11, 40 CFR 86.007-11, and 40 CFR 86.099-11). These regulations affect manufacturers but are relevant to the Project because diesel engines are the primary source of Project emissions besides dust.

Engine tiers are emissions standards that were phased-in by size and model year between 1996 and 2015. Tier 0 engines are engines that were built before the applicable engine tier standard came into effect for each engine size. Tier requirements vary based on the size of the engine. (United States Environmental Protection Agency, 2016)

Regulations Affecting Sources of Hazardous Air Pollutants

The Federal Clean Air Act Amendments (CAAA) Section 112(k) requires the EPA to reduce hazardous air pollutant (HAP) risks in urban areas. The EPA's strategy for reducing these risks is discussed in the Integrated Urban Air Toxics Strategy. Among the major new programs are the operating permits program (Title V) and provisions to phase out ozone-depleting substances (Title VI). Existing programs that have seen major changes due to the amendments include attainment provisions for the National Emissions Standards for Hazardous Air Pollutants (NESHAP) program.

The provisions in Title I that address the control of HAP emissions, or air toxics, include provisions for the promulgation of NESHAP, or maximum achievable control technology (MACT) standards, as well as several related programs to enhance and support the NESHAP Program. The activities and responsibilities required under Section 112 directly affect not only the EPA but State and local regulatory agencies as well. In addition to air quality agencies administering the majority of Section 112, the storage of acutely hazardous materials above threshold quantities is administrated under Section 112(r) by the State Office of Emergency Management through the local Certified Unified Permitting Agencies (CUPAs).

The Project's generators to be installed would be subject to the Reciprocating Internal Combustion Engine (RICE) NESHAP (40 CFR 63, Subpart ZZZZ). The engines would need to meet BACT when installed. Such engines would require monitoring and recordkeeping under this NESHAP.

3.3.3.2 State

The California Air Resources Board (CARB) coordinates and oversees both state and federal air pollution control programs in California. CARB oversees activities of local air districts and is responsible for incorporating air quality management plans developed by each air district into the State Implementation Plan (SIP) for Federal EPA approval. CARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by CARB and EPA to classify areas as "attainment" or "nonattainment" with respect to each pollutant and to monitor progress towards attaining air quality standards. CARB has divided the State into 15 air basins. Significant authority for air quality control is delegated to local air districts that regulate emissions from stationary sources and develop attainment plans.

Criteria Pollutants

The State of California began to set CAAQS in 1969. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are listed in Table 3.3-1.

Originally, there were no attainment deadlines for the CAAQS. However, the California Clean Air Act (CCAA) provided a timeframe and a planning structure to promote their attainment. The CCAA required nonattainment areas in the State to prepare attainment plans and proposed to classify each such area on the basis of the submitted plan. The attainment plans require a minimum 5 percent annual reduction in the emissions of nonattainment pollutants unless all feasible measures have been implemented. The Tulare County area of the SJVAB is currently classified as a nonattainment area for three criteria pollutants: O_3, PM_{10}, and $PM_{2.5}$.

Toxic Air Contaminants

The CARB Statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act (AB 1807, 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987) requires a Statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Under AB 1807, CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community." AB 1807 also requires CARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds. The list of TACs includes all federal HAPs plus the following pollutants: 1,2-dibromoethane, 1,2-dichloroethane, hexavalent chromium, cadmium, inorganic arsenic, nickel, inorganic lead, diesel particulate matter, and environmental tobacco smoke (17 CCR § 93000 and § 93001).

Under AB 2588, facilities are required to report air toxic emissions, ascertain health risks and notify nearby residents of significant risks. In September 1992, the Hot Spots Act was amended by Senate Bill (SB) 1731, which required facilities that pose a significant health risk to reduce their risk through a risk management plan. The emissions inventory and risk assessment information from this program is incorporated into this AQCCIA as discussed in the methodology subchapter.

In July 2007, CARB adopted an airborne toxic control measure (ATCM) for in-use off-road diesel vehicles (13 CCR § 2449 et seq.). This regulation required that specific fleet average requirements be met for NO_x emissions and for particulate matter emissions. Where average requirements cannot be met, BACT requirements apply. The regulation also included several recordkeeping and reporting requirements.

After a series of revisions and amendments, the Final Regulation Order, effective November 30, 2018, establishes a tier based phase out schedule that is outlined in Table 3.3-6 for small fleets (cumulative horsepower of up to 750) and large fleets (cumulative horsepower of greater than 750).

Table 3.3-6. Portable Engine ATCM Phase-Out Schedule

Engine Certification	Engines Rated 50 to 750 break horsepower (bhp)		Engines Rated >750 bhp
	Large Fleet	Small Fleet	
Tier 1	1/1/2020	1/1/2020	1/1/2022
Tier 2 built prior to 1/1/2009	1/1/2022	1/1/2023	1/1/2025
Tier 2 built on or after 1/1/2009	NA	NA	1/1/2027
Tier 3 built prior to 1/1/2009	1/1/2025	1/1/2027	NA
Tier 3 built on or after 1/1/2009	1/1/2027	1/1/2029	NA
Tier 1, 2, and 3 flexibility engines	December 31 of the year 17 years after the date of manufacture. This provision shall not apply to any engine operation before the effective date of this regulation.		

Source: (CARB, 2018).

The CARB ATCM for Stationary Compression Ignition Engines (17 CCR § 93115 et seq.) contains tables of emissions standards that vary based on the size, use, and existence of the engine. Specifically, new engines have to meet emissions standards for all pollutants while existing engines comply by reducing emissions of diesel particulate matter (DPM) by 85% or more. Engines used in agricultural operations have separate requirements as well.

Because the Project is located on an alluvial deposit, and naturally occurring asbestos (NOA) is not found in alluvium, the following ATCM for construction, grading, quarrying and surface mining operations applies to the Project:

- Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (17 CCR § 93105) requires the implementation of mitigation measures to minimize emissions of asbestos-laden dust unless an exemption in the ATCM applies. Applicable to this Project, the ATCM states that the "Air Pollution Control Officer (APCO) may provide an exemption for crushing, screening and conveying equipment, stockpiles, and off-site material transport at a sand and gravel operation if the operation processes only materials from an alluvial deposit."

Assembly Bill 617

On July 26, 2017, Governor Brown approved Assembly Bill No. 617 ("AB 617"). AB 617 added and amended various sections of the California Health and Safety Code. The intent of AB 617 is to develop a collaborative relationship between CARB and local air districts to facilitate community participation, provide a science-based foundation supporting the identification of communities with high cumulative exposure burdens, accelerate the development and use of advanced air monitoring methods and equipment, and support the use of new mobile and stationary source technology. Specific communities have been identified as priority disadvantage communities that are currently subject to AB 617 requirements. The Project is not located in an identified community at this point. If in the future it is identified as being in a disadvantaged community subject to AB 617, the Project would comply with the requirements set forth in AB 617, as applicable.

3.3.3.3 Local

San Joaquin Valley Air Pollution Control District

The Project is in the Tulare County portion of the SJVAB and within jurisdiction of SJVAPCD. SJVAPCD has developed the following plans, guidance, and rules that are potentially applicable to the Project.

The California CAA (CCAA) provides the SJVAPCD with the authority to manage transportation activities and regulate stationary source emissions. Indirect sources of pollution are those sources related to a stationary facility or development project (see Rule 9510) but otherwise outside the Air District authority to regulate. An example of this would be the motor vehicles at an intersection, a mall, and on highways. As a State agency, CARB regulates motor vehicles and fuels for their emissions.

The SJVAPCD has adopted several attainment plans to achieve state and federal air quality standards. The SJVAPCD continuously monitors the region's progress implementing attainment plans and periodically reports

to CARB and the EPA. SJVAPCD periodically revises attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CCAA and Clean Air Act Amendments (CAAA).

SJVAPCD Air Quality Management Plans

The following are state plans that have been adopted by the SJVAPCD.

Extreme 1-Hour Ozone Attainment Demonstration Plan

This plan, adopted by the SJVAPCD board in 2004, sets forth measures and emission reduction strategies designed to attain the federal 1-hour ozone standard by November 15, 2010, as well as an emissions inventory, outreach, and Rate of Progress demonstration. This Plan was approved by the US EPA on March 8, 2010; however, the US EPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (*Sierra Club v. U.S. EPA* [9th Cir. 2012] 671 F.3d 955) remanding EPA's approval of these State Implementation Plan revisions. Concurrent with EPA's final rule, CARB withdrew the 2004 Plan. The SJVAPCD's 2013 Plan for the Revoked 1-Hour Ozone Standard was approved by the SJVAPCD Governing Board at a public hearing on September 19, 2013. The modeling confirms that the San Joaquin Valley will attain the revoked 1-hour ozone standard by 2017.

2007 8-Hour Ozone Plan

This plan sets forth measures and a "dual path" strategy to attain the federal 8-hour ozone standard for the SJVAB by reducing emissions on ozone and particulate matter precursors. The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in State and federal funding for incentive-based measures to reduce emissions. All local measures were to be adopted by the SJVAPCD before 2012. This plan was approved by the EPA on March 1, 2012. On November 26, 2012, however, the EPA withdrew its determination that the plan satisfied the Clean Air Act requirements regarding emission growth caused by growth in vehicle-miles traveled. All other determinations in the EPA's March 1, 2012, rule approving the plan remain unchanged and in effect.

2016 Ozone Plan for 2008 8 Hour Ozone Standard

In order to meet the December 31st, 2031 deadline for attainment, this plan incorporates emissions reduction strategies for stationary sources including regulatory actions; incentive programs; technology advancement programs; policy and legislative activities; public outreach, education, and communication; and undefined strategies under "black box" provisions. The plan demonstrates that existing regulations go above and beyond the Federal Reasonably Available Control Technology (RACT) requirement. The plan also emphasizes that mobile source emissions, which fall under state and federal jurisdiction, make up over 85% of the Valley's Nitrogen Oxide (NOx) emissions. For this reason, the District requested that CARB and EPA adopt and implement strategies so that sources outside District authority would be controlled enabling the standard to be met without the need for "black box" provisions. Moreover, the plan states that CARB and EPA action will be essential to attainment with the AAQS.

2020 Reasonable Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard

The 2020 RACT Demonstration (The Demonstration) includes a comprehensive evaluation of all NOx and VOC District rules to ensure that each rule meets or exceeds RACT. District rules were reviewed and compared to federal, state, and local regulations. State suggested control measures and technology clearinghouses were revised to ensure major sources and EPA Control Technique Guidelines sources in the jurisdiction of the SJVAPCD were subject to RACT. The Demonstration fulfills the federal Clean Air Act requirements and demonstrates that all federal RACT requirements are satisfied by SJVAPCD rules.

SJVAPCD Particulate Matter Plans:

2007 PM_{10} Maintenance Plan

On October 25, 2007, CARB approved the SJVAPCD's 2007 PM_{10} Maintenance Plan and Request for Redesignation with modifications to the transportation conformity budgets. On September 25, 2008, the EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2012 $PM_{2.5}$ Plan

The US EPA set the first $PM_{2.5}$ standard in 1997 and in 2005 designated the Valley as nonattainment for the 1997 standard. The 1997 standard has two limits of attainment: an annual average of 15 µg/m³ and a 24-hour average of 65 µg/m³. The SJVAPCD adopted the 2008 $PM_{2.5}$ Plan in April 2008 to demonstrate how the Valley would come into attainment of the 1997 $PM_{2.5}$ standard by no later than April 2015. US EPA subsequently lowered the 24-hour standard to 35 µg/m³ in 2006 and re-issued the nonattainment designation for the San Joaquin Valley in 2009. Through continued implementation of the 2008 $PM_{2.5}$ Plan, the San Joaquin Valley was expected to be in attainment of the 1997 annual standard by 2015.

The 2012 $PM_{2.5}$ Plan builds on the prior $PM_{2.5}$ plans and demonstrates attainment of the newer 2006 24-hour $PM_{2.5}$ standard by the federal attainment deadline of 2019, with the majority of the Valley actually experiencing attainment ahead of 2019. The SJVAPCD, in collaboration with CARB, based this attainment demonstration on comprehensive analysis, careful evaluation, and a sound scientific foundation. Using the SJVAPCD Governing Board's guiding principles adopted in February 2012, this plan emphasizes public health as the number one priority in meeting federal ambient air quality standards (NAAQS).

The 2012 $PM_{2.5}$ Plan is a multifaceted strategy that utilizes a combination of conventional and innovative control strategies to reduce emissions of $PM_{2.5}$ and other pollutants that form $PM_{2.5}$. The San Joaquin Valley's successes in adopting regulations and other strategies that have improved the San Joaquin Valley's air quality provide the foundation for the Plan. In developing the $PM_{2.5}$ Plan, the SJVAPCD claims to have left "no stone unturned" in evaluating all sources of emissions for potential strategies to reduce emissions.

In addition to reducing direct emissions of $PM_{2.5}$, the 2012 $PM_{2.5}$ Plan focuses on reducing oxides of nitrogen (NO_x) emissions, which is a predominant pollutant not only in the formation of $PM_{2.5}$ in the San Joaquin Valley, but is also the focus of SJVAPCD's ozone reduction strategies. This overlapping significance and emphasis on reducing NO_x emissions helps to address both of the San Joaquin Valley's biggest air quality challenges, $PM_{2.5}$ and ozone. Along with comprehensive efforts at the local level to reduce emissions, reducing mobile source

emissions that are not under the direct authority of SJVAPCD are critical to attaining the standard, and the 2012 $PM_{2.5}$ Plan includes State and federal measures that will provide significant new emissions reductions in the coming years. As outlined below, the Plan's comprehensive control strategy includes regulatory actions, incentive programs, technology advancement, policy and legislative positions, public outreach, participation and communication, and additional strategies.

2015 Plan for the 1997 $PM_{2.5}$ Standard

The 2015 Plan for the 1997 $PM_{2.5}$ Standard was adopted on April 16, 2015, and addresses the EPA annual $PM_{2.5}$ standard of 15 µg/m3 as well as the EPA 24-hour $PM_{2.5}$ standard of 65 µg/m3 both of which were established in 1997. The plan's strategy focuses on attaining the standard quickly, as well as prioritizing $PM_{2.5}$ emissions that pose the most health risk to residents.

2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

The 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard was adopted by the District on September 15, 2016. This plan addresses the $PM_{2.5}$ NAAQS of 12 µg/m^3 with an attainment deadline of December 31, 2021, established in 2012. This plan demonstrates the impracticability of attainment before the deadline and requests the area be reclassified from moderate to serious nonattainment.

2018 Plan for the 1997, 2006 and 2012 $PM_{2.5}$ Standards

Adopted on November 15, 2018, the plan includes significant incentive-based control measures as well as control measures for stationary and area industrial sources. The plan also calls on CARB to act in order to achieve reductions of mobile sources.

SB 656 Particulate Matter Control Measure Implementation Schedule

Senate Bill (SB) 656 was enacted in 2003 and codified as Health and Safety Code Section 39614. SB 656 seeks to reduce exposure to PM_{10} and $PM_{2.5}$ and make further progress toward attainment of the NAAQS and CAAQS for PM_{10} and $PM_{2.5}$. SB 656 required CARB, in consultation with local air districts, to develop and adopt lists of "the most readily available, feasible, and cost-effective" particulate matter control measures. Subsequently, air districts were required to adopt implementation schedules for relevant control measures. In June 2005, the SJVAPCD adopted its SB 656 Particulate Matter Control Measure Implementation Schedule, and has adopted each relevant strategy into their rules.

SJVAPCD Rules and Regulations

The following SJVAPCD rules may be applicable to the Project:

Regulation I (General Provisions):

Rule 1160 (Emission Statements)

Rule 1160 requires owners/operators of stationary sources that emit NO_X or Reactive Organic Gases (ROG) to submit annual emission inventories. More information can be found in the Air Resources Board's "Instructions for the Emission Data System Review and Update Report" document (California Air Resources Board, 1988).

Regulation II (Permits):

Rule 2010 (Permits Required)

Rule 2010 requires, prior to construction, any newly proposed air-polluting facilities to first obtain an Authority to Construct from the Air Pollution Control Officer. Prior to operation of the new facility, the SJVAPCD also requires that any new facility obtain a Permit to Operate from the Air Pollution Control Officer. Permits to Operate must be posted and maintained on or near the source of the air pollution.

Rule 2201 (New and Modified Stationary Source Review)

Rule 2201 establishes SJVAPCD's program to limit emissions at new and modified sources so that there is no net increase in emissions within the SJVAB. Rule 2201 uses BACT and mechanisms such as emissions offsets, to ensure that AAQS are met or maintained. Criteria pollutants are regulated under this Rule, including VOC, NO_x, SO_x, PM_{10}, $PM_{2.5}$, and CO. Under Rule 2201, BACT is required if the emissions of a regulated pollutant would exceed two pounds per day. In addition, emission offsets to mitigate an increase in emissions from a new or modified stationary source would be required if the facility's emissions exceed the following amounts:

- 20,000 pounds per year of NO_x or VOC;
- 200,000 pounds per year of CO;
- 54,750 pounds per year of SO_x; or
- 29,200 pounds per year of PM_{10}.

Project equipment that would be subject to this rule includes stationary sources such as diesel engines and processing units of the aggregate plant, and stockpiles.

Rule 2280 (Portable Equipment Registration)

Rule 2280 outlines the procedure and requirements associated with the registration of portable emissions units. Sand and gravel screening, rock crushing, and RAP crushing operations are among operations eligible for registration of portable equipment, if a portable diesel-fired engine will be used to power processing equipment. Rule 2280 would be applicable to the Project if temporary construction requires equipment (such as a generator set) under Rule 2280.

Regulation III (Fees):

Regulation III contains rules related to District fees. The Project may be subject to fees related to permitting, air toxics, dust, ozone, as well as others.

Regulation IV (Prohibitions):

Rule 4001 (New Source Performance Standards)

Rule 4001 codifies the SJVAPCD's adoption and incorporation of Federal New Source Performance Standards (NSPS) as set forth in 40 CFR Part 60. NSPS apply to a variety of stationary sources, including asphalt plants and aggregate processing plants. However, this Project does not trigger the thresholds to be subject to this rule. If subject to this rule, the regulation imposes emissions standards for relevant pollutants and requires that specified

emission performance standards, control equipment, and monitoring devices be installed at all new, modified, or reconstructed facilities to limit emissions. The regulation includes test methods, monitoring, notification, and recordkeeping requirements. The aggregate plant is subject to 40 CFR Part 60, Subpart OOO, which is discussed above in Section 3.3.3.3.

Rule 4002 (National Emission Standards for Hazardous Air Pollutants)

Rule 4002 incorporates the National Emission Standards for Hazardous Air Pollutants (NESHAPs) as set forth in 40 CFR Part 61, and the NESHAPs for source categories as set forth in 40 CFR Part 63. 40 CFR Part 61 includes emission standards for several known toxic air pollutants, such as beryllium, mercury, and vinyl chloride. 40 CFR Part 63 regulates NESHAP by source categories. Both regulations also include test methods and procedures, as well as monitoring, notification, and recordkeeping requirements. These requirements would be applicable to diesel engines used by the Project.

Rule 4101 (Visible Emissions)

Rule 4101 prohibits emissions of visible air contaminants from any potential source of air contaminants. The rule prohibits air contaminants, other than water vapor, from resulting in greater than Number 1 on Ringelmann Chart (i.e., 20 percent opacity) for a combined period of more than 3 minutes of any hour.

Rule 4102 (Nuisance)

To protect the public health, Rule 4102 prohibits any person from discharging such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Odors are typically addressed under this rule.

Rule 4201 (Particulate Matter Concentration)

To protect the ambient air quality, Rule 4201 establishes a particulate matter emission standard. A release or discharge of dust, fumes, or total suspended particulate matter emissions into the atmosphere from any single-source operation may not exceed 0.1 gr/dscf. Rule 4201 includes test methodology to determine the particulate concentration in an exhaust stream.

Rule 4202 (Particulate Matter Emission Rate)

Rule 4202 limits particulate matter emissions and applies to any source operation that emits or may emit particulate matter. The rule specifies allowable emissions rates based on process weight rate calculations.

Rule 4301 (Fuel Burning Equipment)

Rule 4301 limits the emission of air contaminants from fuel burning equipment. Included in this rule are requirements that fuel burning equipment not discharge:

- Combustion contaminants exceeding 0.1 gr/dscf at 12% carbon dioxide;
- Discharge greater than 200 lbs per hour of sulfur compounds;
- Discharge greater than 140 pounds per hour of nitrogen compounds; or,

- Discharge greater than 10 pounds per hour of combustion contaminants.

Rule 4623 (Storage of Organic Liquids)

Rule 4623 limits VOC emissions from the storage of organic liquids. The rule applies to any tank of organic liquid with a capacity of 1,100 gallons or greater, and requires that such tanks include VOC control systems. The rule includes maintenance, recordkeeping, and testing requirements. However, tanks exclusively receiving and/or storing an organic liquid with a true vapor pressure (TVP) less than 0.5 pound per square inch absolute (e.g., diesel fuel, lubricating and hydraulic oils) are exempt from all other requirements of the rule except for complying with the provisions for (1) TVP and American Petroleum Institute (API) gravity testing, (2) recordkeeping, and (3) test methods.

Regulation VIII (Fugitive PM_{10} Prohibitions):

The rules under Regulation VIII are intended to reduce ambient concentrations of particulate matter (PM_{10} or larger) and were developed pursuant to EPA guidance for Serious PM_{10} Nonattainment Areas. These rules are primarily applicable to specified anthropogenic (i.e., human caused) sources. Applicability of each rule is discussed below and requirements are presented for rules that apply to the Project. Rule 8081 is omitted because it only applies to agricultural sources.

Rule 8011 (General Requirements)

Rule 8011 contains resources referenced by other rules in Regulation VIII including definitions of terms (74), exemptions (4), general requirements related to road dust controls (4), test methods for visual opacity (2) and surface stabilization (6) included as appendices to the Rule, a recordkeeping requirement, and provision allowing operators to implement a Fugitive PM_{10} Management Plan (FPMP) that is designed to achieve 50% control efficiency that has been approved by the APCO.

Rule 8021 (Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities)

Rule 8021 prohibits construction, demolition, excavation, extraction, or other earthmoving activities unless the appropriate requirements are sufficiently implemented to limit visible dust emissions (VDE) to 20% opacity.

Rule 8031 (Bulk Materials)

Rule 8031 requires any facility that performs outdoor handling, storage, and transport of bulk materials to use appropriate methods as listed in Rule 8031 to limit VDE to 20 percent opacity or to comply with the conditions for a stabilized surface as defined in Rule 8011 (General Requirements). Appropriate methods to limit VDE listed in Rule 8031 include:

- Applying water or chemical/organic stabilizers/suppressants;
- Constructing and maintaining sufficient barriers to obstruct wind;
- Storing materials on stabilized surfaces; covering bulk materials with tarps, plastic, or other suitable material; limiting on-site vehicle speed;
- Loading haul trucks to limit VDE;
- Applying water on the top of loads to limit VDE;

- covering haul trucks with tarps or other covers to limit VDE; and
- Maintaining haul trucks to prevent spillage or loss of bulk materials.

Rule 8041 (Carryout and Trackout)

The purpose of Rule 8041 is to prevent or limit fugitive dust emissions from carryout and trackout on paved public roads or the paved shoulders of paved public roads. Facilities subject to Rules 8021, 8031, 8061, or 8071 must also comply with this rule. Rule 8041 requires that affected facilities prevent and/or clean up carryout and trackout at the end of each workday. Cleanup of carryout and trackout is accomplished by manually sweeping and picking up, operating a rotary brush or broom accompanied by sufficient wetting to limit VDE to 20% opacity, operating a PM_{10}-efficient street sweeper that has a pick-up efficiency of at least 80%, or flushing with water if curbs and gutters are not present and where the use of water will not result in a source of trackout material or other adverse impacts, such as a water quality violation under the National Pollutant Discharge Elimination System program. Rule 8041 requires that owners/operators of sites with paved interior roads use a trackout control device to reduce carryout and trackout. Rule 8041 prohibits the use of blower devices, dry rotary brushes, or brooms for removal of carryout and trackout on public roads.

Rule 8051 (Open Areas)

The purpose of Rule 8051 is to limit fugitive dust emissions from open areas. The rule applies to any open area having 0.5 acre or more within urban areas, or 3.0 acres or more within rural areas, and that contains at least 1,000 square feet of disturbed surface area. Whenever open areas are disturbed or vehicles are used in open areas, an owner/operator must implement one or a combination of control measures to comply with the conditions of a stabilized surface at times and to limit VDE to 20 percent opacity. Control measures to be used include applying and maintaining water or dust suppressant(s) to unvegetated areas or establishing vegetation on previously disturbed areas; or paving, applying, and maintaining gravel, or applying and maintaining chemical/organic stabilizers/suppressants. Where open areas are disturbed due to trespass, such activities should be prevented by posting “No Trespassing” signs or installing physical barriers such as fences.

Rule 8061 (Paved and Unpaved Roads)

The purpose of Rule 8061 is to limit fugitive dust emissions from paved and unpaved roads by implementing control measures and design criteria. This rule applies to any new or existing public or private paved or unpaved road, road construction project, or road modification project. Rule 8061 requires that new or modified paved roads have certain specifications based on the road’s existing or projected annual average daily trips (AADT). Requirements include minimum paved or stabilized shoulder widths, as well as curbing, intersection, and median specifications. The rule prescribes requirements for maintenance of public paved roads, including specifications for PM_{10}-efficient sweepers and road cleanup. Rule 8061 also includes requirements for unpaved road segments. Unpaved road segments with 26 or more AADT must stabilize road surfaces by application of water, chemical dust suppressant, washed gravel, or similar measures. In addition, the visible dust emissions associated with such areas is limited to 20 percent opacity. Unpaved roads with fewer than 26 AADT are exempt from some requirements of this rule.

Rule 8071 (Unpaved Vehicle/Equipment Traffic Areas)

This rule limits fugitive dust emissions from unpaved vehicle and equipment traffic areas. Unpaved vehicle and equipment traffic areas with 50 or more AADT must stabilize road surfaces by application of water, chemical dust suppressant, washed gravel, or similar measures. In addition, the visible dust emissions associated with such areas is limited to 20 percent opacity. Unpaved vehicle and equipment traffic areas with less than 50 AADT are exempt from Rule 8071.

Tulare County General Plan

The Tulare County General Plan has a number of policies for air quality. General Plan policies that apply to the Project are listed below.

Section 9.1 – Regional Perspective

Goal AQ-1: To improve air quality through a regional approach and interagency cooperation.

Policy AQ-1.1 – Cooperation with Other Agencies: The County shall cooperate with other local, regional, Federal, and State agencies in developing and implementing air quality plans to achieve State and federal Ambient Air Quality Standards. The County shall partner with the SJVAPCD, Tulare County Association of Governments (TCAG), and the California Air Resource Board to achieve better air quality conditions locally and regionally.

Policy AQ-1.2 – Cooperation with Local Jurisdictions: The County shall participate with cities, surrounding counties, and regional agencies to address cross-jurisdictional transportation and air quality issues.

Policy AQ-1.3 – Cumulative Air Quality Impacts: The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to propose alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.

Policy AQ-1.4 – Air Quality Land Use Compatibility: The County shall evaluate the compatibility of industrial or other developments, which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.

Policy AQ-1.5 – California Environmental Quality Act (CEQA) Compliance: The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonable mitigated when feasible.

Policy AQ-1.7 – Support Statewide Climate Change Solutions: The County shall monitor and support the efforts of Cal/EPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code § 38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

Section 9.4 – Air Pollution Control

Goal AQ-4: To implement the best available controls and monitoring necessary to regulate air emissions.

Policy AQ-4.1 – Air Pollution Control Technology: The County shall utilize the Best Available Control Measures (BACM) and the Reasonably Available Control Measures (RACM) as adopted by the County to support SJVAPCD air quality attainment plans to achieve and maintain healthful air quality and high visibility standards. These measures shall be applied to new development approvals and permit modifications as appropriate.

Policy AQ-4.2 – Dust Suppression Measures: The County shall require developers to implement dust suppression measures during excavation, grading, and site preparation activities consistent with SJVAPCD Regulation VIII – Fugitive Dust Prohibitions. Techniques may include, but are not limited to, the following:

1. Site watering or application of dust suppressants,
2. Phasing or extension of grading operations,
3. Covering of stockpiles,
4. Suspension of grading activities during high wind periods (typically winds greater than 25 miles per hour), and
5. Re-vegetation of graded areas.

Policy AQ-4.3 – Paving or Treatment of Roadways for Reduced Air Emissions: The County shall require that all new roads be paved or treated to reduce dust generation where feasible as required by SJVAPCD Regulation VIII, Rule 8061- Paved and Unpaved Roads. For new projects with unpaved roads, funding for roadway maintenance shall be adequately addressed and secured.

Policy AQ-4.5 – Public Awareness: The County shall promote public awareness of the seriousness and extent of the existing air quality problems.

3.3.4 Significance Thresholds

3.3.4.1 Appendix G Thresholds of Significance

Significant impacts to air quality resources would occur if the Project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations;

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The SJVAPCD guidelines, rules and regulations that were considered in the following determinations of significance are discussed below in Section 3.3.4.2.

3.3.4.2 Additional Thresholds of Significance

The standards (such as NAAQS/CAAQS) and threshold levels (such as Reference Exposure Levels (REL) that are used for health risk assessment) are designated for each pollutant at a level where no "adverse health effect" would occur to sensitive populations. As discussed in detail in the AQCCIA, the standards and threshold levels that have been established by the regulatory agencies are extremely conservative such that compliance with these requirements result in less than a significant impact.

SJVAPCD Guidance

To assess the air quality impact using the CEQA Guidelines, the SJVAPCD has established significance threshold criteria to assist Lead Agencies in determining whether a project may have a significant air quality impact during the initial study. If the project exceeds the significance threshold criteria established for an effect, then the project would be considered to have a significant impact on air quality.

This AQCCIA was prepared using current best practices including the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD, 2015) and the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015). Methods or guidance provided by the San Diego Air Pollution Control District (SDPACD) was also used for determination of fugitive emissions from Quarrying. The SJVAPCD does not specify an emissions factor for material quarrying, but does include a link to the SDACPD emissions factors on the SJVAPCD website. Because quarrying was a central component of the Project, use of the quarry specific SDACPD emissions factor was determined to be appropriate. Use of SDAPCD guidelines is discussed in Section 2.4.2 of the Air Quality Report.

The SJVAPCD identifies threshold criteria that separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be short in duration. The long-term emissions are mainly related to the activities that will occur indefinitely as a result of project operations. In addition, CEQA states that another condition that could establish a project as having a significant effect on the environment is effects that are considered "cumulatively considerable." Threshold criteria for project construction impacts, project operations, and cumulative impacts are discussed below.

SJVAPCD Rules and Regulations

SJVAPCD recommends that air quality assessments reflect emission reductions achieved through compliance with their rules and regulations. The following provides the relevant thresholds that apply to the Project and Section 3.3.2 summarizes SJVAPCD rules and regulations that may be applicable to the Project depending on the emissions quantities and the SJVAB attainment status.

Regional Impacts from Criteria Pollutant Emissions

The quantities of pollutants above which SJVAPCD believes would have a significant effect on air quality are presented in Table 3.3-7. Impacts from construction, operational non-permitted equipment and activities, and operational permitted equipment and activities are evaluated independently from one another. The threshold

criteria are applied on a calendar year basis. For construction emissions, the annual emissions are evaluated on a rolling 12-month period.

Localized Impacts from Criteria Pollutants and Toxic Air Contaminants

The thresholds of significance for Ambient Air Quality are based on the CAAQS and NAAQS. A project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of an ambient air quality standard by exceeding any CAAQS/NAAQS. The standards are listed above in Table 3.3-1. Significance thresholds used by SJVAPCD are presented in Table 3.3-7.

Table 3.3-7. SJVACPD Threshold Criteria for Assessing Impacts

Criteria Pollutants			
Pollutant	Construction Phase [a] (ton/yr)	Operation Phase Permit-Required [a] (ton/yr)	Operation Phase Permit-Exempt [a] (ton/yr)
CO	100	100	100
NOx	10	10	10
ROG	10	10	10
Sox	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
Recommended Toxic Air Contaminants (TACs), Odor Thresholds [b]			
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 20 in 1 million Chronic & Acute Hazard Index ≥ 1.0 (project increment)		
Odor	More than one confirmed complaint per year averaged over a three-year period, or three unconfirmed complaints per year averaged over a three-year period. (Screening distance is one mile for Hot Mix Asphalt (HMA) plants.)		
Ambient Air Quality Standards [c]			
Screening Criteria	100 lb/day of any criteria pollutant after implementation of mitigation measures.		
Modeling Criteria	If modeling is required because emissions exceed the screening criteria (100 lb/day), then the project would have a significant impact on an AAQS if the project concentration plus background concentration measured at the closest air monitoring station exceeds the most stringent AAQS or Significant Impact Level (SIL) in cases where background concentration already exceeds or nearly exceeds the AAQS. Determination of an AAQS exceedance would be determined based on modeling per SJVAPCD policies APR 1925 and APR 2030.		

a Based on SJVAPCD "Air Quality Thresholds of Significance – Criteria Pollutants". (San Joaquin Valley Air Pollution Control District, 2015)

b Based on SJVAPCD Website. (San Joaquin Valley Air Pollution Control District, 2012)

c Based on SJVAPCD "Guidance for Assessing and Mitigating Air Quality Impacts". (SJVAPCD, 2015)

Screening Threshold for On-Site Emissions

In addition to the CAAQS/NAAQS, the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) contains Ambient Air Quality Screening Tools. Impacts require a detailed assessment when on-site emission increases from construction activities or operational activities exceed the 100 pounds per day (lb/day) screening level for

each criteria pollutant evaluated after implementation of enforceable mitigation measures. Under such circumstance, the SJVAPCD recommends that an ambient air quality analysis be performed. An ambient air quality analysis uses air dispersion modeling to determine if emission increases from a project will cause or contribute to a violation of the ambient air quality standards.

For stationary source projects, the GAMAQI states that on-site construction emissions, on-site operational emissions from permitted equipment and activities, and on-site operational emissions from non-permitted equipment and activities each would be screened separately by comparison the 100 lb/day threshold.

Odors

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine if potential odors would have a significant impact. Rather, projects must be assessed on a case-by-case basis.

SJVAPCD GAMAQI recommends that all available pertinent information should be considered in order to qualitatively determine if a significant impact is likely to occur. SJVAPCD recommends that applicable information regarding the characteristics of the odor source be disclosed. Consideration of such parameters assists in evaluating the potential for odor impacts as a result of the proposed Project.

SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. These are presented in Table 3.3-8. Table 3.3-8 is used as a screening tool to qualitatively assess a project's potential to adversely affect area receptors. Aggregate mining and processing is not one of the facilities identified by the District as a potential source of significant odors; however, the table is not intended to be all inclusive.

Table 3.3-8. Screening Levels for Potential Odor Sources

Type of Facility	Distance (miles)
Wastewater Treatment Facilities	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating Operations (e.g., auto body shops)	1
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Source: (SJVAPCD, 2015, p. 103).

Cumulative Impacts

By its very nature, air pollution has a cumulative impact. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Instead, a project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the SJVAB.

When assessing whether there is a new significant cumulative effect, SJVAPCD recommends that whether or not the incremental effects of the project are cumulatively considerable be evaluated. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects [14 CCR § 15064(h)(1)].

If the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located, then the project's incremental contribution to a cumulative effect is not cumulatively considerable (CEQA Guidelines §15064(h)(3)).

Cumulative Impacts Associated with Criteria Pollutants from Permitted Sources

SJVAPCD's attainment plans demonstrate that project-specific net emissions increase below NSR offset requirements will not prevent the District from achieving attainment. Consequently, emission impacts from sources permitted consistent with NSR requirements are not individually significant and are not cumulatively significant.

Cumulative Impacts Associated with Criteria Pollutants from Non-Permitted Sources

When determining cumulative significance, air quality impacts from all non-permitted equipment and activities emissions sources are to be considered when determining if project-specific emissions impacts would be individually significant. The SJVAPCD concludes that when activities and emissions from non-permitted sources are individually significant, they are also cumulatively significant.

Cumulative Impacts Associated with Toxic Air Contaminants

Impacts from TACs are localized impacts. SJVAPCD has established thresholds of significance for TACs that are extremely conservative and protective of health impacts on sensitive receptors. Because impacts from TACs are localized and the thresholds of significance for TACs have been established at such a conservative level, risks over the individual thresholds of significance are also considered cumulatively significant. No other cumulative risk thresholds apply.

3.3.5 Methodology of Analysis

Guidelines and emissions thresholds established by the SJVAPCD in the GAMAQI (SJVAPCD, 2015) are used to assess impacts in this AQCCIA. The SJVAPCD also requires evaluation of cumulative air quality impacts, which are further discussed in Section 3.3.7.

3.3.5.1 Assumptions and Project Design Features

The impact assessment incorporated the following general assumptions:

- The excavation and associated equipment would operate in compliance with applicable air quality regulations.
    - Authorities to Construct and Permits to Operate would be obtained from the SJVAPCD for the portable crush/recycle and wash/screen plants at which time the equipment would be required to utilize Best Available Control Technology (BACT). It is anticipated that the plant would be equipped with water sprays at key emissions points.
    - Diesel engines would comply with applicable State regulations (i.e., air toxic control measures (ATCM)). This includes labeling of off-road equipment with registration numbers assigned by CARB, establishment of an idling policy, and limiting idle time to less than five minutes (13 CCR §2449).
    - A fugitive emission control plan would be implemented to comply with SJVAPCD Regulation VIII, "Fugitive PM_{10} Prohibition" and would include the following measures:
        i. The area to be excavated will be irrigated or sprayed by water trucks when visible dust is observed during excavation activities.
        ii. A water truck will be utilized to wet down the haul road from the excavation to the plant site as necessary to meet SJVAPCD fugitive dust requirements.
        iii. Records demonstrating compliance with fugitive dust requirements will be maintained for those days that a control measure was implemented and include the type of control measure(s) used, the location and extent of coverage, the date, the amount, and frequency of dust suppressant applied (Rule 8011, Section 6.2).
        iv. Limit visible dust emissions to 20 percent opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour and comply with the conditions for stabilized surface areas (Rule 8021, Section 5.0; Rule 8031, Section 5.0).
        v. Stabilize disturbed areas that are greater than 0.5 acres in size and which remain inactive for seven (7) days (Rule 8021, Section 5.2).
        vi. Stabilize stockpile surfaces (Rule 8031, Section 5.0).
        vii. Maintain a stabilized surface on the unpaved haul road (Rule 8021, Section 5.2).
        viii. During high wind conditions, cease excavation and other earthmoving activities that disturb the soil whenever visible dust emissions exceed 20 percent opacity. Continue operation of water trucks/control devices when activities cease, unless unsafe to do so. (Rule 8021, Section 5.4).

ix. Prevent unauthorized vehicle disturbance of open areas by posting signs or installing physical barriers such as fences, gates, posts, and/or other appropriate barriers to effectively prevent access to the area(s) (Rule 8051, Section 5.0).

- The portable crush/recycle plant / diesel generator would be eligible registration in the CARB Portable Equipment Registration Program (PERP).

- The Project is located in Tulare County, which is among the counties listed as containing serpentine and ultramafic rock (OPR, 2000). However, the Project site is located on an alluvial deposit which does not contain serpentine or ultramafic rock and no NOA has been found on the Project site or in the vicinity of the Project.

- The Project would not store hazardous substances or acutely hazardous substances in quantities that would be subject to chemical accident prevention provisions of the CAA or the implementing regulation (40 CFR Part 68).

- Electricity is currently provided to the Project site by Southern California Edison (SCE).

Project Design Features

Project design features are aspects/activities of the Project that are already included in the design of the Project and will be implemented. The impact assessment incorporated the following Project design features:

- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The Project will be managed so that when recycling and/or blending activities were taking place, the excavation and processing of aggregated would be reduced such that the total emissions associated with excavation/processing of aggregate combined with the emissions associated with the transport and processing/blending of recycled materials and additives would not result in an increase to baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.
- A slurry wall would be constructed as early as feasible during the excavation phase of the Project, to facilitate dry mining techniques.
- Activities associated with the Project will comply with all applicable rules and regulations.

3.3.5.2 Emissions Calculations Methodologies

Emissions from combustion and dust sources associated with the Project including on- and non-road diesel engines, light duty truck gasoline engines, excavation/grading activities, aggregates processing, crushing and recycling of aggregates products, stockpile/loadout areas, travel on Project roads, and wind erosion of stockpile areas are calculated in the AQCCIA (Appendix C).

3.3.5.3 CEQA Baseline

In the past, mining has occurred on the adjacent Seaborn site. The emissions resulting from the mining activities on the Seaborn site are considered the baseline emissions to which the Project emissions were compared. As required by CEQA, the net change (increment) between the baseline and the Project is what was evaluated in this AQCCIA to identify potential impacts associated with the Project. The determination of Baseline using emissions that occurred on adjacent facilities in the vicinity of the Project is consistent with previously certified environmental analysis, such as the San Emidio Quarry Expansion Project DEIR and the Kaweah South DEIR.

Due to the cyclical nature of the aggregates industry, an appropriate average baseline must consider a historical time period sufficient to encompass the spectrum of macro-economic conditions that may have affected the operation.

Data provided by the Seaborn site mining operator showed that between 1997 to 2006, the Seaborn facility processing plant was operating at an estimated average of 500,000 tons per year average and 650,000 tons per year maximum. A Notice of Preparation (NOP) was issued on January 27, 2014, (Tulare Irrigation District, 2014) which marks the start of environmental analysis for the Project. Therefore, the chosen Baseline period ends approximately 8 years before the start of analysis. Baseline is discussed in detail in Section 3.3.5 and in the AQCCIA located in Appendix C. Table 3.3-9 presents the equipment associated with baseline excavation.

Based on communications with the Seaborn site operators, the baseline number of employees was 7 to 12 and the equipment used was the standard equipment typically used for aggregate excavation and operations.

The Project would have either the same or less employees and would use the same standard aggregate mining equipment as at the Seaborn site (baseline). Because the Project would be managed such that the aggregate production rate at the processing plant would not increase above baseline levels, the number of trips by on-road haul trucks delivering product to the market would not change from baseline levels. For the purposes of this analysis, the average annual production rate (500,000 tpy) was used to calculate the baseline emissions.

Baseline for Non-Road Engines

Baseline haul distance from the excavation to the processing plant was assumed to be 0.3 miles. This average trip length is half of the longest haul path on the Seaborn site. Loader, excavator and haul truck activity levels were based on haul distance and cycle time analysis. The skid steer, telehandler, de-watering pumps, and water truck(s) were assumed to have fixed operational hours. Baseline equipment activity is summarized in Table 3.3-9.

Table 3.3-9. Baseline Equipment and Activity for Excavation

Equipment	HP	Annual Operating Hours	Max Daily Operating Hours
988 Loader	540	502	14
982 Loader	400	502	14
980 Loader	390	502	14
390 Excavator	530	511	14
Two Haul Trucks	600	1044	14
Skid Steer	65	626	2
Telehandler/Aerial Lift	402	626	2
Water Truck	402	2503	14
Recycle Generator Set	1015	148	14

Source: AQCCIA, Sespe 2021.

Excavation equipment emission factors in the baseline were obtained from the CalEEMod Appendix D Table 3.4: Off-road Emissions Factors for the year 2005. Average annual emissions in the baseline are summarized in Table 3.3-10.

Table 3.3-10. Excavation Exhaust Emissions During the Baseline Period

Period	Units	ROG	CO	NO_X	SO_2	PM_{10} (diesel)	$PM_{2.5}$ (diesel)
Annual	Tons	1.7	6.1	17.5	0.13	0.67	0.67
Max Daily	Pounds	43.7	163.1	457.1	3.24	16.63	16.63
Max Hourly	Pounds	3.2	12.0	33.3	0.24	1.24	1.24

Source: AQCCIA, Sespe 2021.

Baseline for On-Road Engines

The amount of material produced by the Project would remain unchanged from the baseline level. Thus, the number of on road haul trucks and associated emissions would not increase above baseline levels.

In general, diesel engine emissions from all modes of operation decrease in the future due to phase-in of CARB engine regulations; therefore, Project haul trucks and other vehicles/equipment using diesel would emit less emissions than those used in the baseline. This primarily affects cancer risk, which is a multi-year impact.

Baseline Emissions Summary

Table 3.3-11 presents baseline emissions for each emissions source associated with the baseline activity. Sources are broken out into two categories, stationary sources and permit exempt sources. PM_{10} and $PM_{2.5}$ emissions in Table 3.3-11 include both fugitive emissions and engine exhaust emissions. Plant based emissions consist of fugitive dust from material unloading, material transfers, screening, and crushing. Aggregates storage emissions consist of fugitive dust emissions from stockpiles. Excavation fugitive emissions are a result of the quarrying process undertaken by mobile equipment.

Table 3.3-11. Baseline Annual Emissions Summary

Baseline Emissions (tons/yr)							
		ROG	**CO**	**NO_X**	**SO_2**	**PM_{10} Total**	**$PM_{2.5}$ Total**
Stationary Sources	Recycle Plant Fugitive Ems.	--	--	--	--	0.12	0.03
	Recycle Engine	0.12	0.45	1.26	0.0084	0.04	0.04
	Aggregates Plant Fugitive Ems.	--	--	--	--	0.03	0.01
	Aggregates Storage Fugitive Ems.	--	--	--	--	0.38	0.11
Permit Exempt Sources	Excavation Mobile Equipment Fugitive Ems.	--	--	--	--	7.5	2.2
	Excavation Off-road Mobile Equipment Engines	0.86	3.21	8.74	0.06	0.34	0.34
	Aggregates Transfer/Drops from Mobile Equipment, Fugitive Emissions	--	--	--	--	0.62	0.18
	Off-Road Vehicle Haul	0.72	2.48	7.49	0.055	5.6	1.4
	Total Emissions	**1.7**	**6.1**	**17.5**	**0.1**	**14.6**	**4.3**

Source: AQCCIA, Sespe 2021.
-- indicates no emissions of certain criteria pollutants as the emissions are fugitive dust

3.3.5.4 Project Construction Activity Emissions Calculations

The majority of construction activities would take place after the excavation phase is completed and would involve the construction of the reservoir. However, some minor construction activities would take place prior to the excavation phase, such as the installation of the security fence. Because emissions associated with construction activities are typically short term, they are calculated differently than long term activities; therefore, the approach to estimating construction emissions are discussed together in the AQCCIA. The construction activities that are considered short term include building the following activities:

a) Installation of the Project site security features and on-site construction office (prefabricated trailer) including an access gate and perimeter road.

b) Installation of the reservoir inflow channel consisting of a weir, chute, and dissipation pool and Outflow Channel consisting of a weir each requires an excavator, backhoe, water truck, loader, compactor, cement trucks, cement pumps, and cranes.

c) Installation of the reservoir generator building and floating barge pump, including an aboveground diesel tank, would require an excavator, water truck, backhoe, compactor, trencher and cement trucks.

Combustion emission sources during the construction of the reservoir consist of off-road mobile and portable diesel fueled equipment. The off-road equipment emissions were calculated using emissions factors in Appendix D of the CalEEMod User's Guide.

Project Site Security Features and Onsite Office

Zero emissions are assessed for installation of site security fence and the on-site office (which is assumed to be prefabricated) because emissions from these activities are negligible.

Reservoir Inflow and Outflow Channels

The inflow and outflow structures will require excavation and grading to prepare the sites for form installation. These structures are assumed to be constructed using the average units in the 2025 off-road fleet. Inflow/outflow grading consists of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards, and the placement of approximately 9,000 cubic yards of rip-rap. Excavated soils are assumed to be spread onsite.
Table 3.3-12 lists the approximate equipment activity levels for grading.

Table 3.3-12. In/Out-Flow Grading

Description	Equipment	HP	Rate	Quantity	# of 8 hour Days
Clear and Grub, Haul Roads	Dozer	165	1 hr/ac	3 ac	1
Canal Excavation and Spreading	Tractor	530	15 cy/load	20,000 cy @ 3 load/hr	56
Final Shaping of Canal	Grader	200	0.5 hr/ac	3 ac	1
Placing of Rip-Rap	Excavator	184	1 cy/bucket	9,000 cy @ 20 bucket/hr	56
Hauling of Rip-Rap	Dump Truck	300	10 cy/Haul	9,000 cy @ 4 haul/hr	28
Dust Control	Water Truck	230	2 hr/day	56 day	14

Source: Provost & Pritchard Consulting Group, 3/18/2015.

Construction of the in/out-flow building would consist of finish grading and minor excavation of approximately 600 cubic yards and the placement of approximately 1,100 cubic yards of concrete. Excavated soils are assumed to be spread onsite. Table 3.3-13 lists the approximate equipment activity levels for construction.

Table 3.3-13. In/Out-Flow Building

Description	Equipment	HP	Rate	Quantity	# of 8 hour Days
Minor Excavation, Structural Compaction	Excavator	184	1 cy/bucket	500 cy @ 20 bucket/hr	3
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hr	100 cy	3
Concrete Placement (Pump)	Generator	84	20 cy/hr	1,100 cy	7
Placing of Box Culvert	Crane	250	N/A	N/A	10
Dust Control, Soil Conditioning	Water Truck	230	1 hr/day	24	3

Source: Provost & Pritchard Consulting Group, 3/18/2015.

Reservoir Generator Building and Floating Barge Pump

Construction of the generator/barge pump would consist of finish grading and minor excavation as well as excavation and placement of the barge pump discharge pipes.

Table 3.3-14 lists the approximate equipment activity levels for construction of the generator/barge pump.

Table 3.3-14. Generator/Barge Pump

Description	Equipment	HP	Rate	Quantity	# of 8 hour Days
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hr	50 cy	2
Pipe Trench Excavation, Backfill, and Compaction	Excavator	184	200 ft/ 8 hr	1200 ft	6
Concrete Placement (Pump)	Generator	84	N/A	N/A	1
Dust Control, Soil Conditioning	Water Truck	230	1 hr/day	8 days	1

Source: Provost & Pritchard Consulting Group, 3/18/2015.

3.3.5.5 Project Construction Phase Emissions Summary

Construction emissions were determined using CalEEMod User Guide version 2016.3.2. In order to account for various potential construction timelines, construction activities were assumed to take place within the same year. This assumption is conservative, as the Project is likely to spread out construction activities, reducing annual emissions from the estimate made in this analysis. Table 3.3-15 presents emissions from off-road equipment, fugitive dust, and worker trips during the construction phase of the Project.

Table 3.3-15. Project Construction Emissions

Activity	ROG (tpy)	CO (tpy)	NO_X (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Project Construction	0.048	0.29	0.49	0.001	0.022	0.018

Source: AQCCIA Sespe, 2021.

3.3.5.6 Project Excavation Phase Emissions

Excavation is expected to occur for approximately twenty-three years. For the purposes of this analysis the maximum annual production rate (920,000 tons gross, 650,000 tons net) was assumed to occur in the first year of the project. Slurry wall installation is also assumed to take place at the beginning of the Excavation Phase, and is expected to take 1 year. By modeling the maximum year and slurry wall installation in the first year of The Excavation Phase, the model is conservative, as modeled receptors are assumed to be infants and more sensitive to emissions. The average year (720,000 tons gross, 500,000 tons net) was modeled for every year after the first year.

Slurry Wall

The slurry wall will be designed by a qualified professional and installed by a qualified contractor. Slurry wall installation includes the following activities:

- Creation of a perimeter access road that would also serve as a leveling surface for the construction of the slurry wall.
- Creation of an approximately 60- to 80-foot-deep slurry wall surrounding the excavation/Reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow.
- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate Reservoir area.

It is anticipated construction would take approximately 6 months and would include the following on-site facilities. After completion of the slurry wall these facilities would be demobilized from the site:

- Vehicle and equipment parking areas.
- A fill material stockpile area.
- Equipment storage area.
- A bentonite slurry mixing pond (see further discussion below on the slurry wall construction activities).
- A slurry wall backfill mixing area that would be moved along with the construction of the slurry wall so it is always adjacent to the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the West Coast Sand and Gravel's (WCSG's) operations for processing as appropriate.
- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Suitable excavated granular material will be used, or more suitable material will be obtained from the WCSG operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill materials displaces the bentonite slurry in

the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400-feet and its width is typically 3-feet.

- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road.
- A road safety berm will also be constructed along the inside of the road facing the excavation area.
- As the excavation of the reservoir is deepened an access ramp will be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

In summary, slurry wall installation consists of clearing and grubbing approximately 26 acres, excavating approximately 112,000 cubic yards of native soil, and pouring of the slurry wall into the excavated trench. For the purposes of this analysis, soil excavated and transported for the slurry wall construction would be considered part of the total excavated material, such that the average site tonnage excavated (including slurry wall excavation) does not exceed Baseline levels in the max year. Slurry wall materials imported to the site would substitute for exported material such that haul truck activity on-site and off-site would also not increase above Baseline levels. Table 3.3-16 lists the approximate equipment activity levels for construction.

Table 3.3-16. Slurry Wall Excavation and Installation

Description	Equipment	HP	Rate	Quantity	# of 8 hour Days
Clear/Grub, Haul Road, Construction Ponds	Dozer	165	1 hr/ac	26 ac	4
Slurry Wall Excavation	Excavator	429	1.7 cy/bucket	109,000 cy @ 25 bucket/hr	321
Haul Excavated Soil To Mixing Site and Return With Slurry Mix	Dump Truck	300	10 cy/haul	119,000 cy @ 4 hauls/hour	372
Plug Mill for Sieving Native Soils	Generator	100	4 hr/day	401 day	201
Mixing and Moving Slurry Mix	Loader	349	3 cy/bucket	119,000 cy @ 20 bucket/hr	248
Construction Slurry Pump	Generator	84	N/A	N/A	321
Dust Control	Water Truck	230	2 hr/day	401 days	100
Material Import	On-Road Trucks	n/a	14 trips/day at 14.7 VMT/trip	60,000 tons in 4,800 trips	372

Source: Provost & Pritchard Consulting Group, 9/15/2014 (Appendix C).

Project Excavation Activity

Excavation activity would be limited to historical levels in the baseline. Accordingly, dust emissions related to excavation would not increase. However, the excavation emissions would change locations and have been calculated for inclusion in the HRA.

Non-Road Engines

Table 3.3-17 presents the size, type and hours of operation for equipment that would be involved in excavating the reservoir.

Table 3.3-17. Excavation Equipment

Equipment	HP	Operating Hours per Year	Max Daily Operating Hours
988 Loader	540	502	14
982 Loader	400	502	14
980 Loader	390	502	14
390 Excavator	530	511	14
Haul Truck	600	1044	14
Haul Truck	600	1044	14
Dewatering Pump	30	3754	12
Dewatering Pump	30	3754	12
Skid Steer	65	626	2
Telehandler/Aerial Lift	402	626	2
Water Truck	402	2503	14

Source: AQCCIA, Sespe 2021.

Annual hours of operation for the loaders, excavator, and haul trucks were determined based upon cycle time analysis using methods in the Caterpillar Performance Handbook (Appendix C).

The skid steer, telehandler, water trucks and dewatering pumps were assumed to have fixed operational hours. Up to two portable pumps, with 30 hp diesel engines, would be used to dewater the excavations. The pumps would operate continuously to keep the excavation dry.

On-Road Engines

The amount of material produced by the Project would remain unchanged from the Baseline level. Thus, off-site travel activity levels and associated emissions would be unaffected by the Project. Emissions from engines in trucks traveling on-site to export and import materials were calculated and incorporated into the HRA.

The number of employees would remain unchanged from Baseline condition with the Project. In general, diesel engine emissions from all modes of operation decrease in the future due to phase-in of CARB engine regulations. This primarily affects cancer risk which is a multi-year impact.

Excavation Phase Aggregates Processing Plant

The aggregates processing plant emission rate were calculated for both the aggregate screen/wash plant and crush/recycle plant. The screen/wash plant consists mostly of wet screening and material handling, and therefore only has fugitive emissions associated with dry feed materials. The wash/screen plant is run on grid electricity. The crush/recycle plant would be run using a portable diesel generator, and the associated fugitive and engine emissions were calculated for incorporation in the HRA.

Excavation Phase Stockpile/Loadout Area

The stockpile area would not increase from baseline levels with the Project. Emissions from a stockpile area two (2) acres in size was attributed to the stockpile area at the Seaborn site in the baseline and for the Project. Emissions were calculated using the emissions factor and control efficiency recommended in Stationary Source Policy 1610 (SJVAPCD, 2013).

Excavation Phase Travel on On-site Roads

Emissions from travel on roads within the Project site and the Seaborn site depend upon the number of trips, length of the road, weight and speed of the vehicle and road surface condition.

Road lengths in the baseline at the Seaborn site were determined based on aerial photography on Google Earth taken during the baseline period. Half of the longest haul path was chosen as a representative road length in the baseline. Similarly, half of the longest haul path on the Project site was chosen as the average haul trip for the purposes of this analysis.

Excavation Phase Emissions Summary

For emissions calculations, the Project is assumed to operate within the annual maximum production rate of 650,000 tons/year for the first year, and then the average production rate 500,000 tons/year for the following 22 years. Although the length of the excavation phase would be between 15 to 23 years, the actual length of this phase of the Project is dependent on the amount of high-quality aggregate is located in the pit area and the market demand. For the emission calculations it was assumed that it would take 23 years for the excavation of the pit for the reservoir to be completed. Assuming 30 percent waste factor, the maximum amount of material that would be excavated is approximately 920,000 gross tons/year. In order to conservatively model air quality impact, the maximum excavation rate is assessed in the first year, concurrently with the installation of the slurry wall. Excavation maximum annual emissions are shown in Table 3.3-18 and Table 3.3-19 respectively.

Table 3.3-18. Slurry Wall Installation Emissions

Tons/Year					
ROG	**CO**	**NO_X**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
0.34	2.34	3.26	0.01	0.28	0.17

Source: AQCCIA Sespe, 2021.

Table 3.3-19. Excavation Phase Emissions Summary

Baseline Emissions (tons/year)							
		ROG	**CO**	**NO_X**	**SO_2**	**PM_{10} Total**	**$PM_{2.5}$ Total**
Stationary Sources	Recycle Plant Fugitive Ems.					0.12	0.03
	Recycle Engine	0.04	0.18	0.6	0.00083	0.01	0.01
	Aggregates Plant Fugitive Ems.					0.03	0.01
	Aggregates Storage					0.38	0.11
Permit Exempt Sources	Excavation Fugitive Ems.					9.8	2.8
	Excavation Offroad Engines	0.34	2.09	3.3	0.0074	0.1	0.1
	Aggregates Transfer/Drops					0.8	3.1
	Off-Road Vehicle Haul	0.4	2.67	3.68	0.0069	17.4	3.8
	De-watering Pumps	0.14	0.77	0.76	0.0013	0.0	0.0
	On-Road Vehicle Haul	0.0009	0.01	0.14	0.00082	0.1	0.0
Total Future Emissions:		**0.9**	**5.7**	**8.5**	**0.02**	**28.7**	**10.1**
Baseline Emissions:		**1.7**	**6.1**	**17.5**	**0.1**	**14.6**	**4.3**
Project Emissions:		**-0.8**	**-0.4**	**-9.0**	**-0.1**	**14.1**	**5.7**

Source: AQCCIA Sespe, 2021.

3.3.5.7 Project Operation Phase Emissions

The following assumes that on average the proposed basin could be filled two times per year for a total usable yearly volume of 9,100 acres-feet. Approximately 3,580 acres-feet can flow by gravity into the St. Johns River and the remaining 5,520 acres-feet can be pumped out at a maximum flow rate of 160 cubic feet per second. Table 3.3-20 lists the approximate equipment activity levels for operations and Table 3.3-21 shows the emissions associated with the Project operation phase.

Table 3.3-20. Project Operations

Non-Road Sources	**Equipment**	**HP**	**Rate**	**Quantity**	**# of 8 hour Days**
Pumping	Generator	600	160 cfs	7,700 ac-ft	73
Minor Site Maintenance	Backhoe	108	N/A	N/A	20
On-Road Sources	**Equipment**	**Vehicle Miles Traveled / Year**			
Support Trucks	Spray Truck	380			
Support Trucks	Pickup	2,080			
Support Trucks	Fuel Truck	450			

Source: Provost & Pritchard Consulting Group, 3/18/2015 (Appendix C).

Table 3.3-21. Project Operation Emissions

Activity	ROG (tpy)	CO (tpy)	NO_X (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Generators	0.031	0.28	0.09	0.0014	0.0031	0.0031
Backhoe	0.007	0.10	0.04	0.0002	0.0006	0.0006
Support Vehicles	0.004	0.02	0.01	0.0001	0.0002	0.0002
Total	**0.042**	**0.4**	**0.15**	**0.0017**	**0.0039**	**0.0039**

Source: AQCCIA Sespe, 2021.

3.3.5.8 Health Risk Assessment

A HRA was performed using current best practices including methods from the HRA Guidelines (OEHHA, 2015). The four steps involved in the risk assessment process are: 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization. These four steps were used to assess health risk for the Project and each step is discussed below.

Hazard Identification and Quantification

For air toxics sources, hazard identification involves the pollutant(s) of concern emitted by a facility, and the types of adverse health effects associated with exposure to the chemical(s), including whether a pollutant is a potential human carcinogen or is associated with other types of adverse health effects. Appendix A of the HRA Guidelines (OEHHA, 2015) includes a list of TACs that are used for HRA in California.

DPM is the primary toxic constituent emitted by mining projects. DPM has an assigned cancer potency factor (CPF) and a non-cancer reference exposure level (REL) that are used to evaluate the risk from the DPM concentration present.

Fugitive emissions were generally speciated into constituent TACs based on SJVAPCD speciation profiles. San Diego Air Pollution Control District (SDAPCD) speciation profiles were also used when speciation data was not available from SJVACPD. The resulting mass of each TAC was used as input along with the dispersion coefficients to predict the ground level concentration (GLC) of each TAC which could then be used to evaluate the dose received by each receptor along each exposure pathway and, in the case of non-cancer risk, on each target organ, which was performed using HARP2 as discussed in the following subsections.

TACs incorporated in the HRA can be found in Table 3.3-22. Specific speciation profiles for road-based emissions, aggregates processing emissions, storage emissions, and excavation emissions can be found in Appendix C. Diesel emissions were evaluated for diesel particulate matter.

Table 3.3-22. Toxic Air Contaminants Incorporated in HRA

CAS	Chemical Name
7429905	Aluminum
7440382	Arsenic
7440393	Barium
7440417	Beryllium
7440439	Cadmium
18540299	Hexavalent Chromium
7440473	Chromium
7440484	Cobalt
7440508	Copper
7439921	Lead
7439965	Manganese
7440020	Nickel
7782492	Selenium
1175	Silica, Crystalline
7440666	Zinc

Source: AQCCIA Sespe, 2021.

The HRA considered whether health risk from asbestos should be quantified. It was determined based on review of available maps (California Department of Conservation, Division of Mines and Geology, 2000) and language in the Asbestos ATCM's (17CCR §93105 and §93106) that allows the APCO to exempt sand and gravel facilities operating in alluvial deposits, that asbestos is unlikely to exist within, or upstream from, the Project site. Therefore, asbestos was excluded from the HRA.

Exposure Assessment

The purpose of exposure assessment is to estimate the extent of public exposure to emitted substances. For the Hot Spots program, in practice this means estimating exposures for those emitted substances for which potential cancer risk or noncancer health hazards for acute, repeated 8-hour, and chronic exposures will be evaluated. This involves emission quantification, modeling of environmental transport, evaluation of environmental fate, identification of exposure routes, identification of exposed populations, and estimation of short-term (e.g., 1-hour maximum), 8-hour average, and long-term (annual) exposure levels.

Hot Spots Analysis and Reporting Program (HARP2) software developed by CARB can be used to model ground level concentrations at specific off-site locations. HARP2 incorporates the US EPA-approved dispersion model, American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). AERMOD is a steady-state plume model based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. CARB recommends AERMOD for Hot Spots risk assessments (OEHHA, 2015).

In this HRA, the air dispersion modeling was performed separately from HARP2 using AERMOD View by Lakes Environmental, Version 10.0.1 running AERMOD executable Version 2112. Output from the Lakes software program were imported to HARP2 (dated 21081) which was then used to perform the risk characterization portion of the HRA.

The process of using air dispersion modeling results as the basis of HRA follows these four steps:

1. Air dispersion modeling is used to estimate annual average and maximum one-hour ground level concentrations (GLC). The air dispersion modeling results are expressed as an air concentration or in terms of (Chi over Q) for each receptor point. (Chi over Q) is the modeled downwind air concentration (Chi) based on an emission rate of one gram per second (Q). (Chi over Q) is expressed in units of micrograms per cubic meter per gram per second, or $(\mu g/m^3)/(g/s)$. (Chi over Q) is sometimes written as (X/Q) and is sometimes referred to as the dilution factor.

2. When multiple substances are evaluated, the X/Q is normally utilized since it is based on an emission rate of one gram per second. The X/Q at the receptor point of interest is multiplied by the substance-specific emission rate (in g/s) to yield the substance-specific GLC in units of $\mu g/m^3$. The following equations illustrate this point.

   $$GLC = \left(\frac{X}{Q}\right) \times Q_{Substance}$$

   $$\frac{X}{Q} = (Chi\ over\ Q)\ in\ \left(\frac{\mu g/m^3}{g/s}\right), from\ model\ results\ with\ unit\ emission\ rate$$

   $$Q_{Substance} = substance\ emission\ rate\ \left(g/s\right)$$

3. The applicable exposure pathways (e.g., inhalation, soil contact, fish consumption) are identified for the emitted substances, and the receptor locations are identified. This determines which exposure algorithms are ultimately used to estimate dose. After the exposure pathways are identified, the fate and transport algorithms are used to estimate concentrations in the applicable exposure media (e.g., soil or water) and the exposure algorithms are used to determine the substance-specific dose.

4. The dose is used with cancer and noncancer health values to calculate the potential health impacts for the receptor. An example calculation using the high-end point-estimates for the inhalation (breathing) exposure pathway can be found in Appendix I of the HRA Guidelines (OEHHA, 2015).

AERMOD was used as described above to calculate a X/Q for each source-receptor combination by setting the emission rate for each source in the model to one gram per second (1 g/s). Other parameters used in AERMOD describe overall control of the model domain and functionality (e.g., coordinate system, terrain, non-default options, etc.), receptors (e.g., location, height), sources (e.g., size, location, exhaust velocity, temperature, operating schedule), meteorology (files provided by SJVAPCD), and output file options.

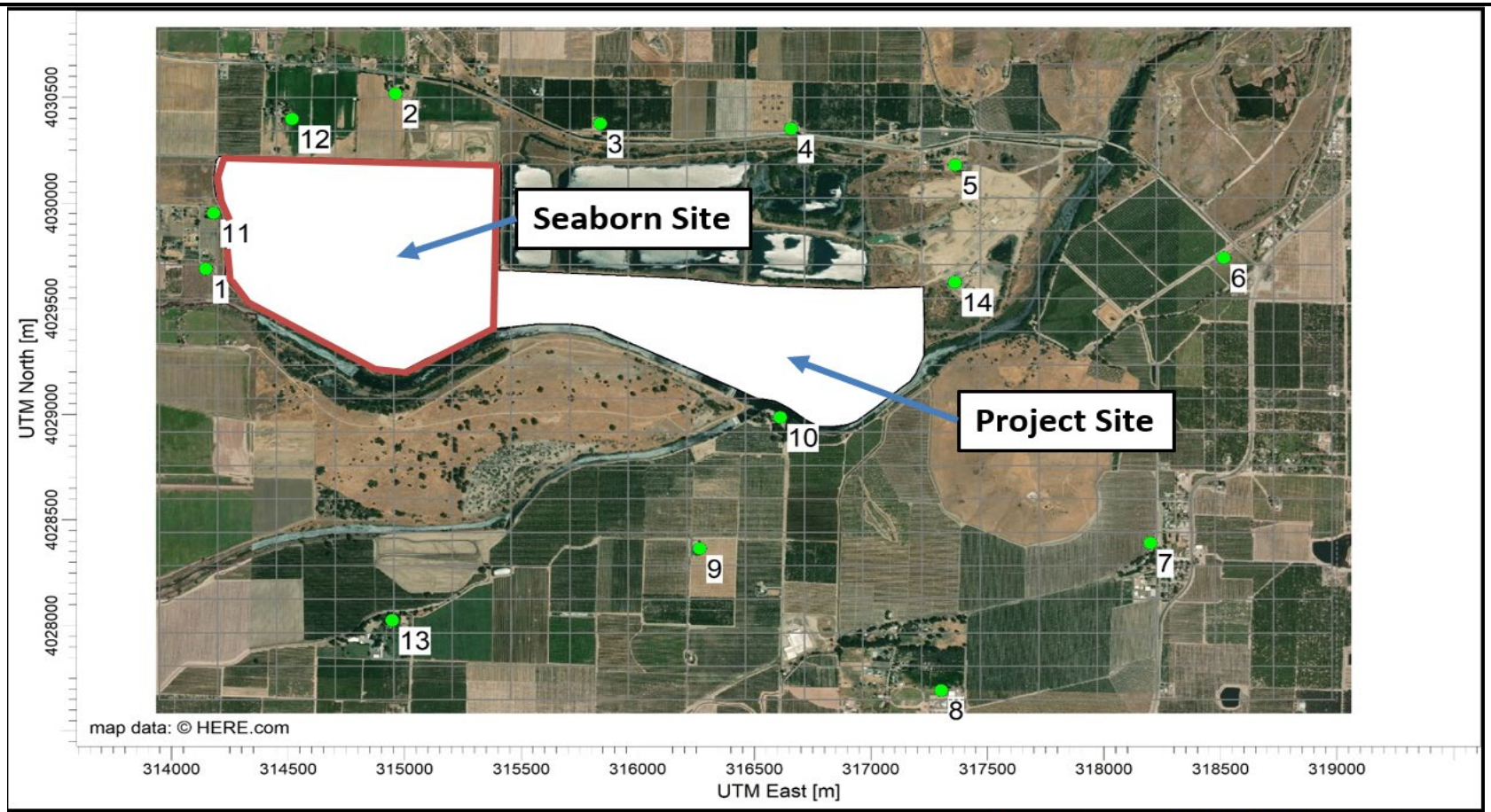
The Control Pathway of AERMOD was set to provide output in units of concentration; and both wet and dry plume depletion were disabled. The non-regulatory default option of flat terrain was selected as well as the beta option "Adjusted Friction Velocity (u*) in AERMET (ADJ_U*)" as discussed above. Pollutant/averaging options were set to PM_{10} with averaging times of 1-hour and the period of the meteorological data file (i.e., five years). The rural dispersion coefficient was used and exponential decay was excluded.

Receptors were modeled at a flagpole height of 1.5 meters (m). Fourteen (14) discrete receptors (actual structures/residences), 441 grid receptors (location obtained from overlaying a grid on the Project area), and 179 boundary receptors (points along the boundary of the Project site) were modeled for a total of 634 receptors. The discrete receptors are shown on Figure 3.3-1 and listed in Table 3.3-23.

Table 3.3-23. Discrete Receptors

Figure ID Number	Model ID Number	UTM Coordinates	Description
1	396	314147m E, 4029689m N	Residence
2	397	314961m E, 4030517m N	Residence
3	398	315839m E, 4030375m N	Residence
4	399	316657m E, 4030352m N	Residence
5	400	317361m E, 4030179m N	Residence
6	401	318513m E, 4029741m N	Residence
7	402	318199m E, 4028391m N	Residence
8	403	317302m E, 4027693m N	Sequoia Union Elementary School
9	404	316265m E, 4028364m N	Residence
10	405	316611m E, 4028986m N	Residence (owned by TID)
11	406	314180m E, 4029952m N	Residence
12	407	314516m E, 4030398m N	Residence
13	408	314946m E, 4028025m N	Residence
14	409	317360m E, 4029626m N	Cemex Facility Worker

Source: AQCCIA Sespe, 2021
Note: Project is in UTM Zone 11N.

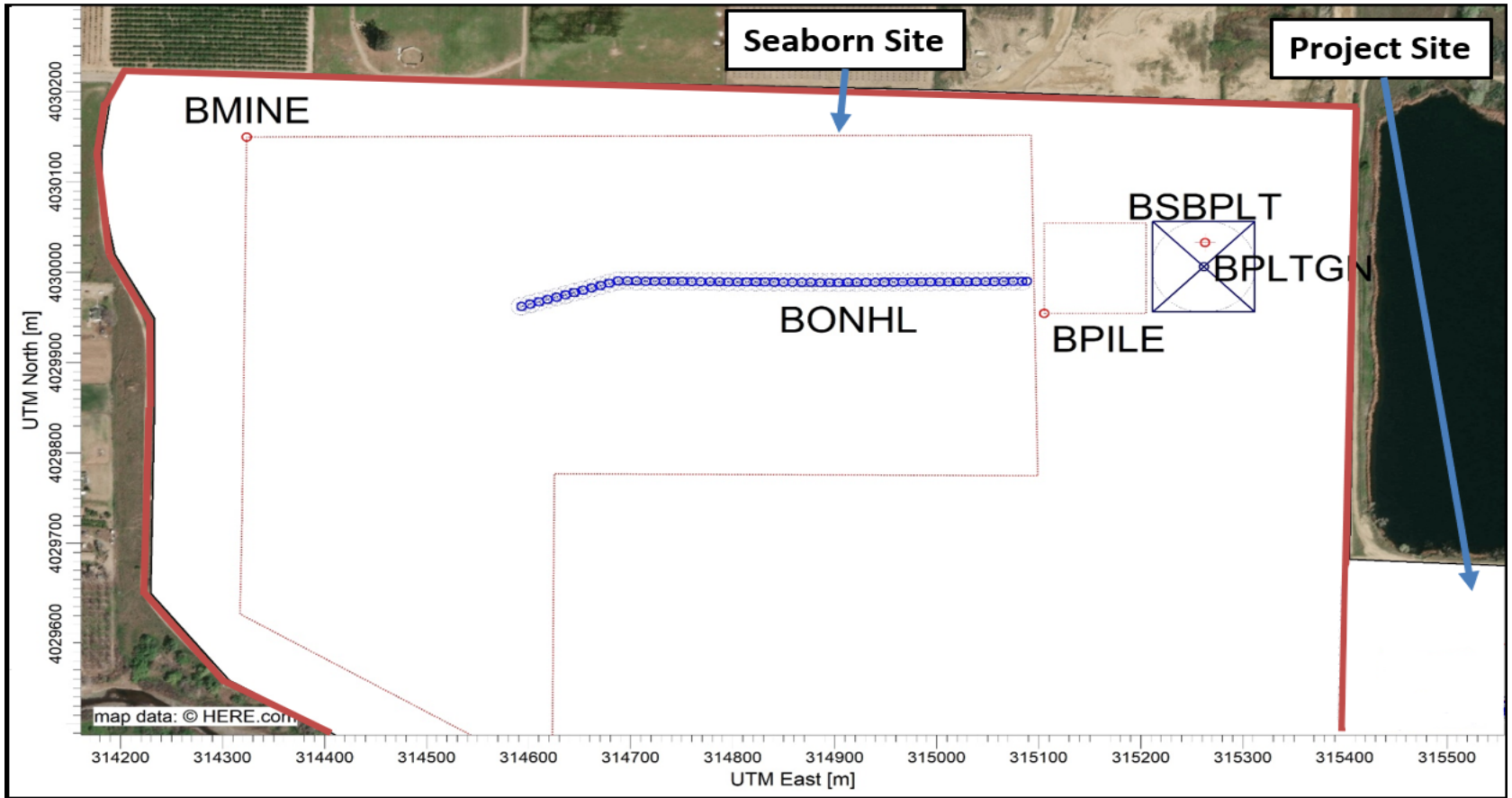


Grey Lines Represent Cartesian Receptor Grid
Red Line Indicates Seaborn Site Boundary
Green Dots Indicate Discrete Receptors

SESPE CONSULTING, INC.

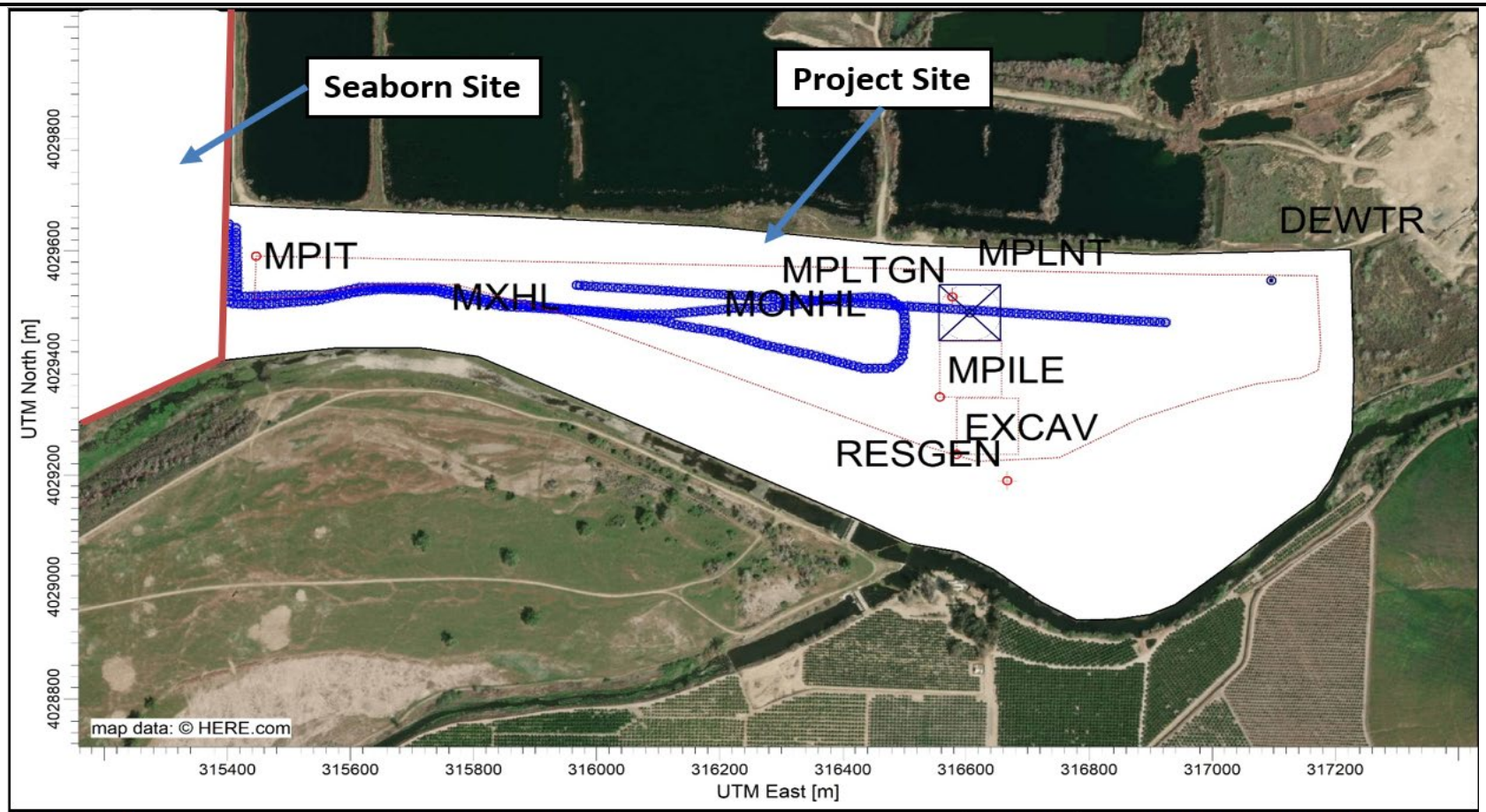
FIGURE	AERMOD Model Receptors		
7	McKay Point Reservior Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.10	DATE:	8/11/22
SCALE:	SHOWN	DRAWN BY:	ADA

Figure 3.3-1 Facility Map and Receptor Locations



Red Boundary Indicates Seaborn Site Boundary	SESPE CONSULTING, INC.	FIGURE 6a	Baseline Model Sources		
BMINE - Baseline Mine Area			McKay Point Reservior Project		
BONHL - Baseline Onsite Haul Road			Tulare Irrigation District		
BPILE - Baseline Stockpile Area			Tulare County, California		
BSBPLT - Baseline Seaborn Plant		PROJECT #:	TU01.20.10	DATE:	8/11/22
BPLTGN - Baseline Seaborn Plant Generator Stack		SCALE:	SHOWN	DRAWN BY:	ADA

Figure 3.3-2 Baseline Site Model Sources



MPILE - Stockpiles	MPLT - Agg/Recycle Plants
MPIT - Pit Model Source Object	DEWTR - Dewatering Pump
EXCAV - Excavation Mobile Emissions	
MXHL - Haul Road for Exported Material	
MONHL - Haul Road for Onsite, Off-road Engines	
MPLTGN, RESGEN - Genset Engine Stacks for Plant, Reservoir Pump	

SESPE CONSULTING, INC.

FIGURE	McKay Site Model Sources		
6b	McKay Point Reservior Project		
	Tulare Irrigation District		
	Tulare County, California		
PROJECT #:	TU01.20.10	DATE:	8/11/22
SCALE:	SHOWN	DRAWN BY:	ADA

Figure 3.3-3 Project Site Model Sources

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Sources that existed during the baseline period and those proposed by the Project are illustrated on Figure 3.3-2 and Figure 3.3-3. Project and baseline sources were included in the model. Project sources were assigned positive emissions values and baseline sources were assigned negative values so that the HRA result represent the change in health risk with the Project.

A wind rose showing the frequency of direction and speed of wind at the Visalia Airport (2007 through 2010) was produced from wind data obtained from the SJVAPCD website (Figure 3.3-6). The U-star adjusted (ADJ_U*) wind data file was chosen from the SJVAPCD website for the Project because it is a mining project and similar to the project discussed in the EPA Memo on this topic (EPA, 2016). Visalia Airport (Station No. 93144) is about 19 miles west-southwest of the Project.

Output of the dispersion model in the form of plotfiles, one for each combination of source and averaging period, that contain X/Q values were then used in HARP2 with the emissions rates presented above and other human exposure parameters discussed below to predict the acute, non-cancer chronic, and cancer risk at each receptor. The modeling files are provided in the AQCCIA.

Once emissions exit the source, the substances emitted will be dispersed in the air. The emission plume may contain both vapor phase substances and particulates. A semivolatile organic toxicant can partition into both vapor and particulate phases. Particulates can deposit on vegetation, on soil, and in water at a rate that is dependent on the particle size. A deposition rate of 0.05 m/s is conservative and was used for the Project HRA. The following algorithms are used to estimate concentrations in environmental media including air, soil, water, vegetation, and animal products.

Once emissions exit the source, the substances emitted will be dispersed in the air. The emission plume may contain both vapor phase substances and particulates. A semivolatile organic toxicant can partition into both vapor and particulate phases. Particulates can deposit on vegetation, on soil, and in water at a rate that is dependent on the particle size. A deposition rate of 0.05 m/s is conservative and was used for the HRA (located in the AQCCIA). The following algorithms are used to estimate concentrations in environmental media including air, soil, water, vegetation, and animal products.

Determination of the concentration in air is made using X/Q and the emissions rate (g/s) as discussed above. The concentration of the substance in soil (Cs) is a function of the deposition, accumulation period, chemical specific soil half-life, mixing depth, and soil bulk density. For simplicity and health protection, the Tier 1 default assumes 70-year soil deposition for the accumulation period at end of 70-year facility lifetime. The water pathway is evaluated as if a standing water body (e.g., pond or lake) is impacted by facility emissions and is used as a source for drinking water by food-producing animals or humans, or is a source of angler-caught fish. The average concentration of the substance in water (Cw) is a function of direct deposition (material carried in by surface run-off may occur as well but is not modeled). Concentrations in vegetation, animal products, angler caught fish, and mother's milk are predicated on the concentrations estimate to be in the air, water, and soil. The Project HRA includes air, soil ingestion, home grown produce, and mother's milk as pathways of exposure. Detailed discussion of the

methodologies used to determine the concentrations in various media to which receptors may be exposed is located in Subchapter 5.3 of the HRA Guidelines (OEHHA, 2015).

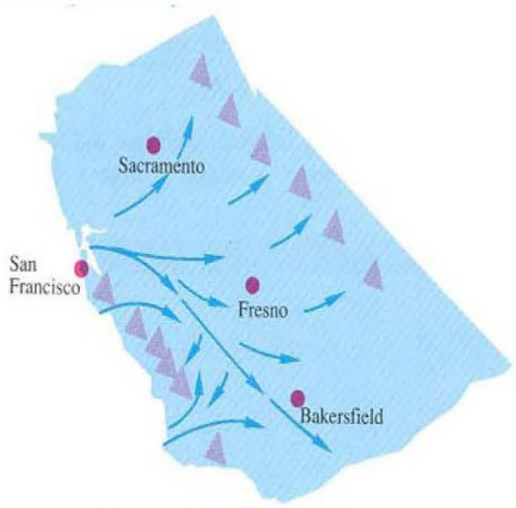


Source: Carmelita Mine DEIR (County of Fresno, 2011)

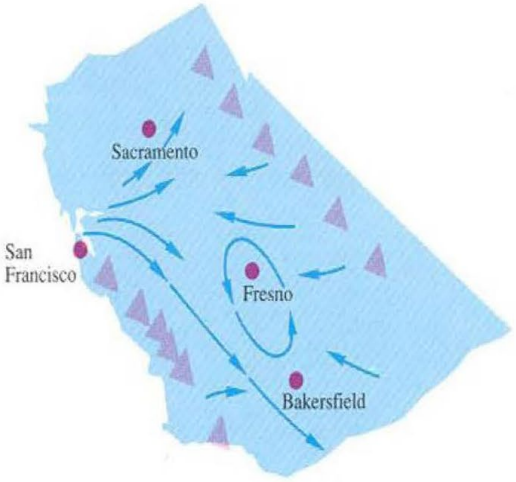
SESPE CONSULTING, INC.

FIGURE	Air Basin Boundaries San Joaquin Valley, CA		
PROJECT #:	TU01	DATE:	2/25/16
SCALE:	no scale	DRAWN BY:	SDC

Figure 3.3-4 Air Basin Boundaries



Daytime Wind Flow Patterns



Nighttime Wind Flow Patterns

Source: San Joaquin Valley Air Basein Plan Demonstrating Attainment of Federal 1-hour Ozone Standards (Oct. 8, 2004)

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SESPE CONSULTING, INC.

FIGURE	WIND PATTERNS DURING OZONE SEASON San Joaquin Valley Air Basin		
PROJECT #:	TU01	DATE:	2/25/16
SCALE:	no scale	DRAWN BY:	SDC

Figure 3.3-5 Wind Patterns During Ozone Season

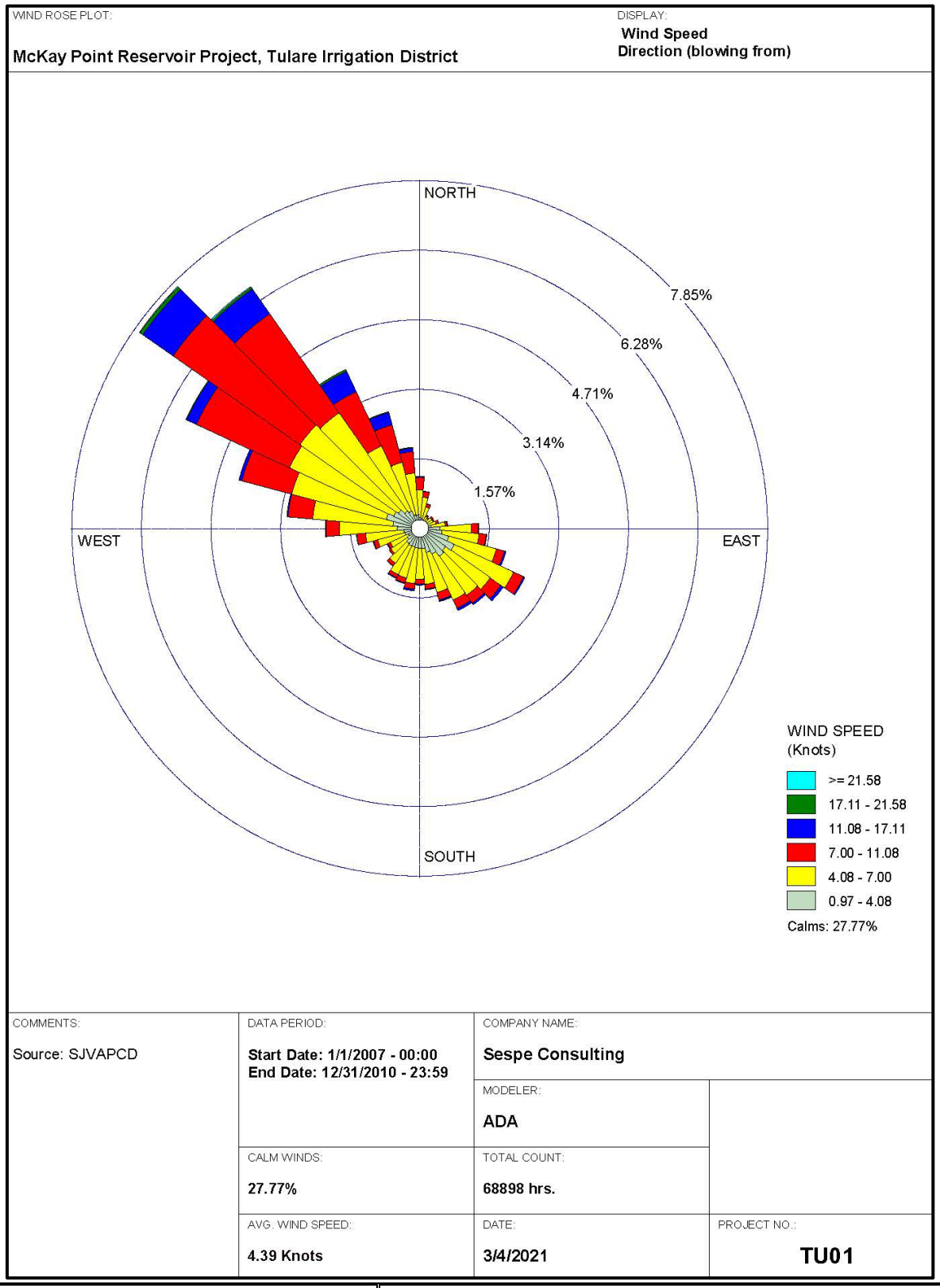


Figure 3.3-6 Wind Rose (2007 through 2010) – Visalia Airport Station

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Once the concentrations of substances are estimated in air, soil, water, plants, and animal products, they are used to evaluate estimated exposure to people. Exposure is evaluated by calculating the daily dose in milligrams per kilogram body weight per day (mg/kg/d). The HRA Guidelines describe the algorithms used by HARP2 to calculate this dose for exposure through inhalation, dermal absorption, and ingestion pathways. All chemicals are assessed for exposure through inhalation. Emissions of semi-or non-volatile multi-pathway substances (e.g., earth metals in fugitive dust), the soil ingestion pathway and the dermal soil exposure pathway are also assessed. The mother's milk pathway is used depending on the multi-pathway substance released. The HRA assessed each of these pathways, as discussed in detail in the AQCCIA.

Risk Characterization

Risk characterization is the final step of the HRA. In this step, information developed through the exposure assessment is combined with information from the dose-response assessment to characterize risks to the general public from emissions. In the California, OEHHA conducts the dose-response assessment during the development of cancer potency factors and Reference Exposure Levels (REL). These are used in conjunction with the exposure estimates to estimate cancer risk and evaluate hazard from noncancer toxicity of emitted chemicals. Under AB2588, risk characterizations present both individual and population-wide health risks. A general summary of the risk characterization components includes the following items and information.

- The locations of the point of maximum impact (PMI), the maximum exposed individual receptor (MEIR), and the maximum exposed individual worker (MEIW) are to be identified. The PMI, MEIW, and MEIR for cancer risk and for noncancer hazard indices (averaging times for acute 1-hour, repeated 8-hour, and chronic hazard indices) may not be the same location; all should be identified.
- The location of any specified sensitive receptors (e.g., schools, hospitals, daycare, or eldercare facilities) should be identified.
- Estimates of population-wide cancer risk and noncancer hazard.

Cancer Risk

Cancer risk is calculated by multiplying the daily inhalation or oral dose, by a cancer potency factor, the age sensitivity factor, the frequency of time spent at home (for residents only), and the exposure duration divided by averaging time, to yield the excess cancer risk. As described below, the excess cancer risk is calculated separately for each age grouping and then summed to yield cancer risk at the receptor location. A brief description of the age sensitivity factors, exposure duration, and frequency of time spent at home are included below. These factors are discussed in various technical support documents to the HRA Guidelines (OEHHA, 2015).

OEHHA has determined that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA developed age sensitivity factors (ASFs) to take into account the increased sensitivity to carcinogens during early-in-life exposure. In the absence of chemical-specific data, OEHHA

recommends a default ASF of 10 for the third trimester to age 2 years, and an ASF of 3 for ages 2 through 15 years to account for potential increased sensitivity to carcinogens during childhood. These values manifest in the intake parameters presented below.

Fraction of time spent at home (FAH) during the day can be used to adjust exposure duration and cancer risk from a specific facility's emissions, based on the assumption that exposures to the facility's emissions are not occurring away from home. From the third trimester to age <2 years, 85% of time is spent at home. From age 2 through <16 years, 72% of time is spent at home. From age 16 years and greater, 73% of time is spent at home. Facilities with a school within the 1×10^{-6} (or greater) isopleth are directed to use FAH = 1 for the child age groups (3rd Trimester, 0<2 years, and 2<16 years).

For residential inhalation exposure, cancer risk must be separately calculated for specified age groups because of age differences in sensitivity to carcinogens and age differences in intake rates (per kg body weight). Separate risk estimates for these age groups provide a health-protective estimate of cancer risk by accounting for greater susceptibility in early life, including both age-related sensitivity and amount of exposure. The following equation illustrates the formula for calculating residential inhalation cancer risk.

$$RISK_{inh-res} = DOSE_{air} \times CPF \times ASF \times \frac{ED}{AT} \times FAH$$

Where:

$RISK_{inh-res}$ = Residential inhalation cancer risk
$DOSE_{air}$ = Daily inhalation dose (mg/kg-day)
CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for a specified age group (unitless)
ED = Exposure duration (in years) for a specified age group
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Cancer risks calculated for individual age groups are summed to estimate the total cancer risk over the period of interest and/or lifetime. Cancer risk is typically expressed in "chances per million" (cancer risk × 10^6) but may also be expressed in other ways, such as "chances per 100,000" or "chances per 10 million" (cancer risk × 10^7). The SJVAPCD utilizes a threshold of "20 in one million" when analyzing the cancer risk resulting from the operations of both permitted and non-permitted sources.

For assessment of off-site worker cancer risk at the MEIW, the default assumes working age begins at 16 years. The daily inhalation dose ($DOSE_{air}$) is based on the adjusted 8-hour concentration at the MEIW (for noncontinuous sources) and amount of time the offsite worker's schedule overlaps with the facility's emission schedule. The duration of exposure at the MEIW receptor is 25 years. Additional consideration for offsite worker cancer risk assessment is whether there are women of child bearing age at the MEIW location and whether the MEIW has a daycare center. Under most circumstances, cancer risk accumulated by inhalation is calculated using the following equation:

$$RISK_{inh-work} = DOSE_{air} \times CPF \times ASF \times \frac{ED}{AT}$$

Where:

$RISK_{inh-work}$ = Worker inhalation cancer risk
$DOSE_{air}$ = Daily inhalation dose (mg/kg-day)
CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for a specified age group (one for working age 16 to 70)
ED = Exposure duration (in years) for a specified age group (25 years)
AT = Averaging time for lifetime cancer risk (70 years)

As discussed previously, some substances (e.g., semi-volatile organics and metals) are carcinogenic regardless of how they enter the body. Exposures to these substances are called multi-pathway. HRA for a facility that emits a multi-pathway pollutant must, at a minimum, evaluate doses from soil ingestion and dermal exposure. If polycyclic aromatic hydrocarbons, lead, dioxins, furans, or polychlorinated biphenyls are emitted, then the breast-milk consumption pathway becomes mandatory for residential receptors. OEHHA has developed transfer coefficients for these chemicals from the mother to breast milk. The other exposure pathways (e.g., ingestion of homegrown produce or fish) are only evaluated for residential receptors if the facility impacts that exposure medium and the receptor under evaluation can be exposed to that medium or pathway.

Non-inhalation residential cancer risk is calculated using the same steps as inhalation cancer risk. The pathway under evaluation (e.g., soil ingestion) is multiplied by the substance-specific oral slope factor, expressed in units of inverse dose (i.e., $(mg/kg/day)^{-1}$), the appropriate ASF, and exposure duration divided by averaging time to yield the cancer risk for a specified age grouping. Cancer risk for each age group is summed as appropriate for the exposure duration.

If multiple substances are emitted, the substance-specific cancer risks for all exposure pathways are summed to give the (total) multi-pathway cancer risk at the receptor location. HARP2 displays the multi-pathway risk for each carcinogenic substance and a breakdown of the cancer risk from each exposure pathway.

This HRA evaluates mother's milk due to presence of lead in fugitive dust. The default assumption inherent in the intake rate is that the infant's only source of food is breast for the first year (e.g., is fully breastfed), which is one-half of the 0<2 year age group used in the Hot Spots program. Thus, the cancer risk by the mother's milk pathway is calculated with a slightly modified equation using a different exposure duration. Once the cancer risk is determined for the mother's milk pathway then it is summed with the other risks to calculate the total cancer risk for the receptor.

OEHHA recommends that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months (e.g., a 2-month project would be evaluated as if it lasted 6 months). Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases,

for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs. Thus, for example, if one is evaluating a proposed 10-year project, the cancer risks for the residents would be calculated based on exposures starting in the third trimester through the first ten years of life.

Non-Cancer Risk

Estimates of noncancer inhalation health impacts are determined by dividing an airborne concentration at the receptor by the appropriate REL. This is termed the Hazard Index (HI) Approach. A REL is used as an indicator of potential noncancer health impacts and is defined as the concentration at which no adverse noncancer health effects are anticipated. When a health impact calculation is performed for a single substance, then it is called the hazard quotient (HQ). Each REL for a substance will have one or more target organ systems (e.g., respiratory system, nervous system, etc.) where the substance can have a noncancer health impact. Thus, all HQs have specified target organ systems associated with them. The sum of the Hazard HQs of all chemicals emitted that impact the same target organ is the HI. Inhalation RELs for noncancer health impacts have been developed for acute, 8-hour, and chronic exposures to a number of substances.

Acute RELs are designed to protect against the maximum 1-hour ground level concentration at the receptor. Chronic RELs protect against long-term exposure to the annual average air concentration spread over 24 hours/day, 7 days/week.

Eight-hour RELs are designed to protect people with daily 8-hour schedules, such as offsite workers, in an impacted zone. The 8-hour RELs are used for typical daily work shifts of 8-9 hours and represent concentrations at or below which health impacts would not be expected even for sensitive subpopulations in the general population with repeated daily 8-hour exposures over a significant fraction of a lifetime. The 8-hour RELs can be used to evaluate the potential for health impacts (including effects of repeated exposures) in offsite workers, and to children and teachers exposed during school hours.

Acute, 8-hour, and chronic RELs are needed because the dose metrics and even the health impact endpoints may be different with the different exposure durations of acute, daily 8-hour, and chronic exposures. Also, although chronic REL values are lower or set the same as 8-hour RELs, there are some cases such as special meteorological situations (e.g., significant diurnal-nocturnal meteorological differences) or intermittent exposures where the 8-hour REL may be more protective than the chronic REL.

As discussed above, in order to calculate the acute, 8-hour, or chronic HQ, the maximum ground-level concentration (in $\mu g/m^3$) during the appropriate period of time (i.e., 1-hour acute, 8-hour, and 1-year chronic) is divided by the corresponding REL (in $\mu g/m^3$) for the substance. If a receptor is exposed to multiple substances that target the same organ system, then the HQs for the individual substances are summed to obtain a Hazard Index (HI) for that target organ as shown in the following equations.

$$HI_{Organ1} = \frac{C_{air,1}}{REL_1} + \frac{C_{air,2}}{REL_2} + \cdots + \frac{C_{air,n,}}{REL_n}$$

or

$$HI_{Organ1} = HQ_1 + HQ_2 + \cdots + HQ_n$$

A HI of 1.0 or less indicates that adverse health effects are not expected to result from exposure to emissions of that substance. As the HI increases above one, the probability of human health effects increases by an undefined amount. However, HI above one is not necessarily indicative of health impacts due to the application of uncertainty factors in deriving the RELs.

There are non-cancer multi-pathway pollutants that are assessed for inhalation, ingestion, and other non-inhalation pathways. Nickel and arsenic are two that are found in fugitive dust and so the non-inhalation exposures to these metals are assessed for the corresponding target organs. Specifically, nickel effects the respiratory, hematologic, and alimentary systems while arsenic affects development; the nervous and cardiovascular systems; and the skin.

3.3.6 Project-Level Impacts and Mitigation Measures

3.3.6.1 Conflict With or Obstruction to the Implementation of an Air Quality Plan

Impact Statement

Impact AQ-1: *Would the Project conflict with or obstruct implementation of the applicable air quality plan?* **(Appendix G Threshold Criteria (a))**

Impact Analysis

The SJVAPCD is tasked with implementing programs and regulations required by the CAA and the CCAA. In that capacity, the SJVAPCD has prepared plans to attain Federal and State ambient air quality standards. The SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on SJVAPCD NSR offset requirements for stationary sources. Stationary sources in the SJVAPCD are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of SJVAPCD offset requirements are a major component of the SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the SJVAPCD's air quality plan". (SJVAPCD, 2015, p. 65).

The Operator would be required to comply with regional air quality rules promulgated by the SJVAPCD and participate in reducing air pollutant emissions. Aggregates production is proportional to population growth, which is a factor that is accounted for in air quality plans. Therefore, the Project would not obstruct implementation of the applicable SJVAPCD air quality plan. Project impacts were determined to be less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.3.6.2 Net Increase of Criteria Pollutants

Impact Statement

Impact AQ-2: *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?* **(Appendix G Threshold Criteria (b))**

Impact Analysis

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are either significant or "cumulatively considerable", meaning they add considerably to a significant environmental impact. An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed.

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development. Future attainment of State and Federal ambient air quality standards is a function of successful implementation of the SJVAPCD's attainment plans. Consequently, the SJVAPCD's application of thresholds of significance for criteria pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

The CEQA Lead Agency, which for this Project is the TID, may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (CCR §15064(h)(3)).

Thus, if project emissions (change from baseline) exceed thresholds for NOx, ROG, PM_{10} or $PM_{2.5}$, then the project would result in a cumulatively considerable net increase of a criteria pollutant for which the SJVAPCD is in non-attainment under applicable Federal or State ambient air quality standards. This does not imply that if the project impact is less than those significance criteria, it cannot be cumulatively significant. The significance criteria are presented in and include thresholds that are applied separately

to construction and operation activities of a project. Construction phase emissions are summarized and compared to applicable thresholds in Table 3.3-24.

Table 3.3-24. Construction Phase Criteria Pollutant Annual Emissions

	ROG (ton/yr)	CO (ton/yr)	NO_X (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SOx (ton/yr)
Construction	0.0231	0.1957	0.2357	0.0368	0.0203	0.00046
Threshold	**10**	**100**	**10**	**15**	**15**	**27**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: AQCCIA Sespe, 2021.

Hourly and annual emissions were quantified for the excavation phase. Annual emissions thresholds apply separately for Permitted and Permit-Exempt sources. Table 3.3-25 and Table 3.3-26 present annual and hourly excavation phase emissions respectively, and compare the emissions to the applicable significance thresholds.

Table 3.3-25. Excavation Phase Criteria Pollutant Annual Emissions

Criteria Pollutant	Permitted Sources (tons/year)	Permitted Sources Significance Threshold (tons/year)	Exceeds Permitted Sources Threshold?	Permit-Exempt Sources (tons/year)	Permit-Exempt Sources Significance Threshold	Exceeds Permit-Exempt Threshold
ROG	-0.08	10	**No**	-0.35	10	**No**
CO	-0.27	100	**No**	2.20	100	**No**
NO_X	-0.66	10	**No**	-5.10	10	**No**
PM_{10} (total)	-0.02	15	**No**	14.37	15	**No**
$PM_{2.5}$	-0.03	15	**No**	5.93	15	**No**
SO_X	-0.01	27	**No**	-0.10	27	**No**

Source: AQCCIA Sespe, 2021.

Table 3.3-26. Excavation Phase Criteria Pollutant Daily Emissions

Criteria Pollutant	CO (ton/yr)	NO_X (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SOx (ton/yr)
Baseline	163	457	260	80	3.24
Excavation	119	221	529	160	0.40
Project	-45	-236	269	80	-2.83
Screening Criteria	**100**	**100**	**100**	**100**	**100**
Exceeds Criteria?	**No**	**No**	**Yes**	**No**	**No**

Source: AQCCIA Sespe, 2021.

As seen in Table 3.3-26, daily PM_{10} emissions are potentially significant.

The level of road dust control in the baseline is based upon watering two to three times per day. That level of watering is assigned 80% control efficiency. Increasing the control efficiency to 90% would result in an additional reduction of approximately 50%. As shown in EPA's AP-42 Figure 13.2.2-2 pertaining to unpaved roads, watering alone can achieve up to 95% control. The certified Kaweah South Project EIR, which is a similar aggregate mining and processing operation located approximately 0.5 miles southwest of the Project site, assigned 93% to the combination of "limiting vehicle speed to 15 mph, improving surfaces with aggregate, and watering" (Tulare County, 2006). Thus, 90% control is feasible and achieved in practice using water or a combination of water and chemical dust suppressants (e.g., magnesium chloride, lignin sulfonate, etc.). The excavation phase has maximum net emissions (Project minus baseline) of 269 lbs/day which would be reduced to 84.8 lbs/day with the additional control (Appendix C, Mitigated Emissions, Maximum Year). Therefore, with Mitigation Measure AQ-1, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard and is therefore less than significant.

Level of Significance Before Mitigation

Daily PM_{10} emissions are potentially significant.

Mitigation Measures

Mitigation Measure AQ-1 is recommended to avoid causing or contributing to an existing or projected violation of an air quality standard.

Mitigation Measure AQ-1*:*

> *Roads upon which material is hauled to the on-site plant for processing shall be controlled by methods that will achieve 90% reduction of fugitive dust. This can be achieved by frequent watering, use of chemical dust suppressants, or a combination of watering and chemical dust suppressants. Other methods which achieve 90% reduction of fugitive dust may be acceptable with Lead Agency approval.*

Level of Significance After Mitigation

Less than Significant.

3.3.6.3 Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

Impact Statement

Impact AQ-3: *Would the Project expose sensitive receptors to substantial pollutant concentrations?* **(Appendix G Threshold Criteria (c))**

Impact Analysis

Determination of whether project emissions would expose sensitive receptors to substantial pollutant concentrations is a function of assessing potential health risks. Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects

of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. When evaluating whether a Project has the potential to result in localized impacts, the nature of the air pollutant emissions, the proximity between the emitting sources associated with the Project and sensitive receptors, the direction of prevailing winds, and local topography must be considered (SJVAPCD, 2015, p. 66).

A HRA was performed as discussed in Section 3.3.5.8 to evaluate the effects of TACs including DPM from vehicles and various substances found in fugitive dust emissions (i.e., metals and crystalline silica). Risk from all three phases of the Project are each incorporated into the values presented in Table 3.3-27 which shows the cancer risk at the closest residential and sensitive receptors including Sequoia Union Elementary School.

Health risk is determined based on the change in conditions between the baseline and the Project. Emissions sources present in the baseline cease to operate, and emissions from the Project are introduced. Therefore, baseline risk is modeled as negative risk (emissions going away), and Project risk is modeled as positive (new emissions). In many cases, Project emissions end up being lower than those in the baseline, due to newer technologies and updated regulations. In such cases, risk to receptors may be reduced, as the Project results in a reduction of emissions. In cases where risk to a receptor is greater in the baseline than in the Project, the risk is represented by the statement “No Increase”.

In accordance with SJVAPCD guidance, the health risk threshold for cancer risk used in the AQCCIA was 20 in a million. As shown in Table 3.3-27, health risk from the Project is less than significant. Receptor 10 is a residence owned by the Applicant. Receptor 14 represents workers at the CEMEX Facility.

Table 3.3-27. Health Risk Results

Receptor Figure Label – Type	Receptor Model ID Number	Excess Cancer Cases per Million People Exposed (Threshold 20 in a million)	Chronic Hazard Index (Threshold i.0)	Acute Hazard Index (Threshold i.0)
1 – Residence	396	No Increase	0.0	0.000
2 – Residence	397	No Increase	0.0	0.020
3 – Residence	398	4.4	0.23	0.031
4 – Residence	399	3.9	0.14	0.059
5 – Residential	400	1.9	0.08	0.065
6 – Residential	401	No Increase	0.03	0.094
7 – Residential	402	1.9	0.09	0.075
8 – Elementary School	403	No Increase	0.04	0.059
9 – Residential	404	No Increase	0.03	0.099
10 – Residential MEIR (TID Owned)	405	18.4	0.59	0.33
11 – Residential	406	No Increase	0	0.000
12 – Residential	407	No Increase	0	0.000
13 - Residential	408	No Increase	0.001	0.035

Receptor Figure Label – Type	Receptor Model ID Number	Excess Cancer Cases per Million People Exposed (Threshold 20 in a million)	Chronic Hazard Index (Threshold i.0)	Acute Hazard Index (Threshold i.0)
14 – Worker, Cemex Facility MEIWR	409	0.76	0.07	0.25
15 – PMI	519	N/A	N/A	0.46
Significance Threshold	**N/A**	**20**	**1.0**	**1.0**
Threshold Exceeded?	**N/A**	**No**	**No**	**No**

Source: AQCCIA Sespe, 2021.
Note: Threshold values obtained from SJVAPCD's CEQA guidance website (http://www.valleyair.org/transportation/0714-GAMAQI-TACs-Thresholds-of-Significance.pdf).
These receptors represent locations of highest exposure.
Negative values represent risk reduction compared to Baseline levels.
MEIR: Maximum Exposed Individual Receptor; MEIW: Maximum Exposed Individual Worker; PMI: Point of Maximum Impact

Level of Significance Before Mitigation

Less than Significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.3.6.4 Odors Affecting a Substantial Number of People

Impact Statement

Impact AQ-4: *Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?* **(Appendix G Threshold Criteria (d))**

Impact Analysis

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, the SJVAPCD recommends that odor analyses strive to fully disclose all pertinent information.

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the San Joaquin Valley. These are presented in Table 3.3-28 below along with a reasonable distance from the source within which, the degree of odors could possibly be significant. If the proposed project would result in sensitive receptors being located closer than the screening level distances, a more detailed analysis should be provided and include information regarding odor complaints (SJVAPCD, 2015, p. 103). It should be noted that aggregate mining and processing activities are not included on the SJVAPCD table; however, the table is not intended to be all inclusive.

Table 3.3-28. Odor Screening Distances

Type of Facility	Odor Screening Distance (miles)
Wastewater Treatment Facilities	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating Operations (e.g., auto body shops)	1
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Source: (SJVAPCD, 2015).

Diesel exhaust from mobile equipment/vehicles has a slight odor. Odor intensity would decrease rapidly with distance and is not expected to be frequently (or at all) detectable at locations outside of the Project site boundary. In addition, given the subjective nature of odors, such odors are generally only considered to be objectionable by residential receptors (i.e., not by occupational workers). Given the rural nature of the Project vicinity, there are few residences located within 1 mile of the reservoir where the majority of the on-site emissions of diesel exhaust from mobile equipment/vehicles would occur. Therefore, it is not anticipated that objectionable odors affecting a substantial number of people could result from the Project.

If a substantial number of odor complaints are received by the SJVAPCD, such complaints would be addressed under the SJVAPCD nuisance rule (Rule 4102), which reads:

> *"A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property."*

Therefore, in the unlikely event that a significant number of odor complaints were documented as a result of the Project, they would be addressed by the SJVAPCD. Project impacts were determined to be less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.3.7 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 in Section 3.0 identifies the other projects within the County and the City of Woodlake considered in regards to potential cumulative impacts. Also see Figure 3.0-1 which displays the location of the cumulative projects in relation to the Project site.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to air quality.

Generally, the context for cumulative impacts for air quality impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the impact analysis (Section 3.3.6) above for each impact threshold, the Project was determined to have either no impact, a less than significant impact, or significant but mitigated to a less than significant level. Since the Project would present no significant impacts related to noise or vibration, there would be no cumulative impact in conjunction with the other cumulative projects.

3.4 BIOLOGICAL RESOURCES

3.4.1 Introduction

This section of the DEIR describes the biological resources present onsite and in the immediate vicinity of the Project site, and an analysis of potential impacts of the Project on those biological resources. The Biological Study Area (BSA) includes the Project site, portions of the adjacent Seaborn site and adjacent lands within 250-feet of the Project site. The analysis is based on the findings in the McKay Point Reservoir Project Biological Resources Evaluation completed by Bumgardner Biological Consulting (BBC) (Bumgardner Biological Consulting, 2021) and associated field work and surveys.

The analysis and information provided within this DEIR section was derived from the following studies and associated field work/surveys, which are included in the DEIR appendices:

- Tulare Irrigation District McKay Point Reservoir Biological Resources Evaluation Report, Tulare, California (Bumgardner Biological Consulting, 2013) (Biological Resources Report, Appendix D1)
- Tulare Irrigation District McKay Point Reservoir Biological Resources Evaluation – Addendum No. 1, Tulare, California (Bumgardner Biological Consulting, 2021) (Biological Resources Report Addendum, Appendix D2)
- Elderberry Inventory Report for the Proposed Reservoir of the Tulare County Irrigation District at McKay Point Near Visalia, California (Entomological Consulting Services, Ltd., 2014) (Elderberry Inventory Report, Appendix D3)

3.4.2 Environmental Setting

3.4.2.1 Regional Setting

The Project site is located in unincorporated Tulare County, near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek before draining into the Tulare Lake bottom near Corcoran. Area climate typically includes cool rainy winters having a mean daily temperature ranging from 40° to 50° Fahrenheit (F), and hot dry summers where daytime temperatures can exceed 100° F. Rainfall increases with elevation in the foothills and ranges from approximately 10 inches at the base to 25 inches at 3,000 feet. Most of this precipitation occurs from November through April.

Currently in the foothills, the vegetation ranges from annual grasses in open areas to dense shrubs and trees. Much of the native vegetation in the area has been replaced by introduced species or has been eliminated by cultivation and overgrazing. Agriculture is currently the main land use in the region, although narrow strips of riparian vegetation grow along remnant tributaries.

Biological resources in the region have been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley

oak and interior live oak on higher ground. Herbaceous wetland bottoms and upland native grassland communities were common in this vegetation mosaic. The extensive oak forests and riparian/wetland habitats hosted a diverse and abundant wildlife community. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation.

3.4.2.2 Vicinity Setting

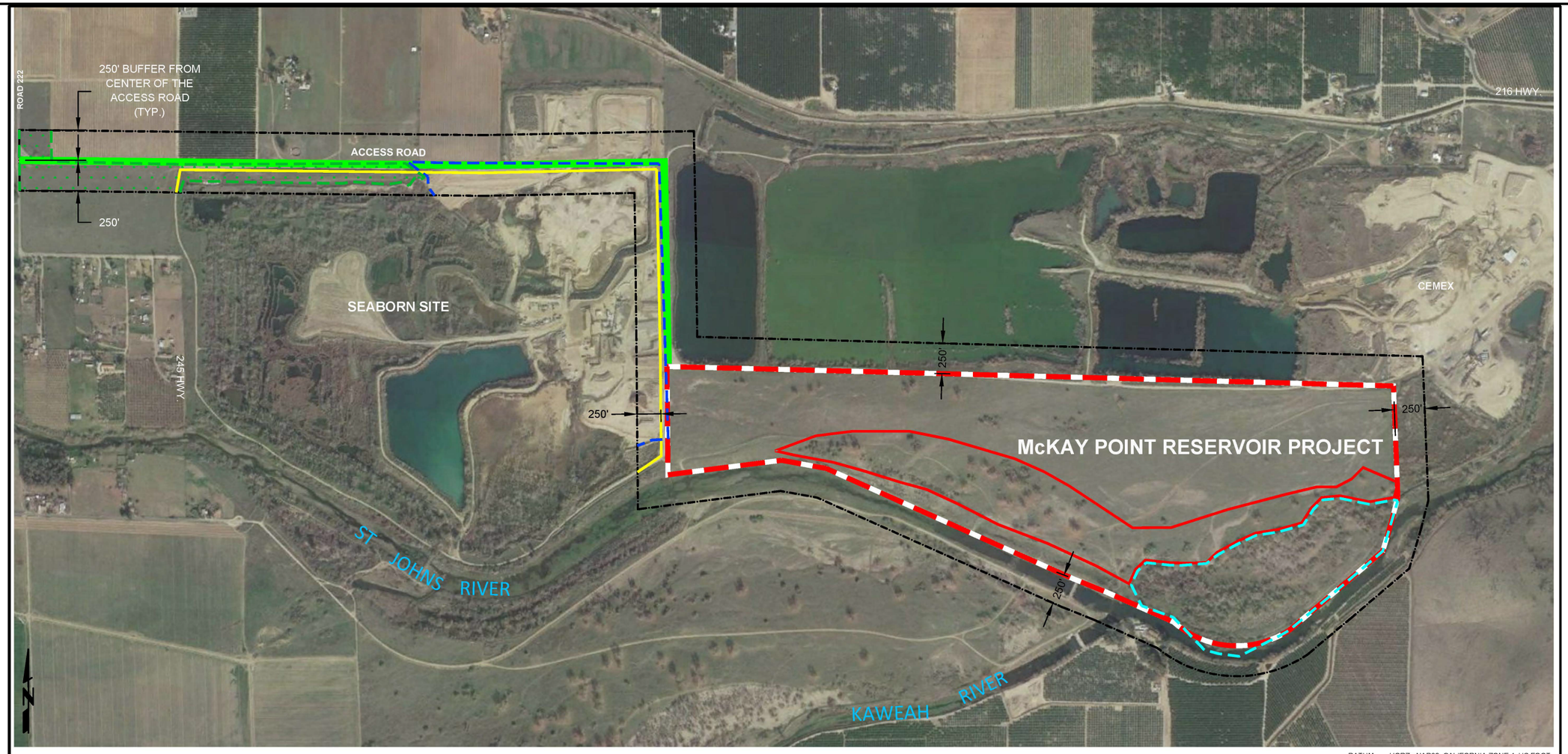
Surrounding land use in the immediate Project site vicinity includes existing or previously active aggregate mining operations to the north and east the CEMEX Lemon Cove and Stillwell facilities, to the southeast the Kaweah South facility, and to the west the previous Kaweah Rock/Santa Fe facilities on the Seaborn site. Lands to the south and east are used intensively for agricultural and, to a limited extent, for rural residential purposes.

3.4.2.3 Project Site Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. Most of the Project site is vegetated with non-native annual grasses. However, native grasses (primarily riparian species) and oak-riparian woodlands are present and increase in density with proximity to the nearby rivers, especially in a small area along the Kaweah River in the southeastern portion of the site. Aggregate mines have historically been and/or currently are operating at properties adjacent to and in the vicinity of the Project site. Lands to the south and east are used intensively for agricultural and, to a limited extent, for rural residential purposes. The surface soil at the site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. The site topography is relatively level with a depression in the southeast corner and a slight elevation increase in the north. Site surface drainage is generally to the south and southeast toward the Kaweah River and to the south and southwest toward the St. John's River. The site elevation falls from approximately 472-feet above mean sea level (amsl) at the northeastern end of the property, to approximately 454 feet amsl at the southwestern end.

Existing Plant Communities

Much of the Project site and adjacent area's (i.e., BSA) vegetation consists of non-native annual grassland (see Figure 3.4-1), and includes grasses such as wild oat [*Avena fatua*]), as well as herbaceous species such as lamb's-quarters (*Chenopodium album*), wild cucumber (*Marah* sp.), and deer weed (*Acmispon glaber*). Small, scattered stands of mule fat (*Baccharis salicifolia*) also occur within the non-native annual grassland. However, these latter stands are not significant enough in size to warrant mapping as a discernible vegetation community.



Source: Sespe Consulting, Inc. (February 2021)

Figure 3.4-1 Biological Study Area – Vegetation Communities

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Sensitive Vegetation Community

The only sensitive habitats that occur on the Project site or within the BSA are the mixed oak-riparian woodland that is found in the southeastern portion of the Project site and the adjacent elderberry savannah.

Woody species that are associated with the mixed oak-riparian woodland include willows (*Salix* spp.), Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizeni*). California wild grape (*Vitis californica*) occurs as a liana growing into the canopy of the woody species. The canopy cover in this stand of vegetation varies between approximately 20 and 100 percent and is best described as interrupted woodland. The mixed oak-riparian woodland is classified as Great Valley Mixed Riparian Forest in the Natural Communities List in *A Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf and Evens, 2009) and is tracked by the California Department of Fish and Wildlife (CDFW) as a sensitive natural community in the California Natural Diversity Data Base (CNDDB).

Approximately 40 acres of elderberry savannah (a sensitive natural community tracked by the CDFW) occurs adjacent to the mixed oak-riparian woodland, but also extends west along the southern border of the Project site (see Figure 3.4-1). It should be noted that the depicted boundaries approximate the borders of this vegetation community and the mixed oak-riparian woodland as the two communities have no clearly discernible boundary where they occur adjacent to and grade into each other. The dominant species in the elderberry savannah is blue elderberry. However, scattered Fremont's cottonwoods and willows also occur in this vegetation community. The onsite elderberry shrubs/clumps are large and old with many stems and likely represent the remnants of a formerly more contiguous community.

Special-Status Plant Species

No special-status plant taxa were observed within the BSA during the surveys. In addition, no special-status plant taxa that have been documented in the Project region (see Biological Resources Report, Addendum No. 1 located in Appendix D2 of this DEIR) are considered to have any potential to occur on the Project site or within the BSA given the onsite conditions (i.e., mostly high to moderately grazed non-native annual grassland and/or known and limited distribution of the taxon).

Wildlife Resources

Reconnaissance-level surveys within the BSA resulted in the documentation of relatively low wildlife diversity (i.e., 2 species of amphibians, 1 species of reptile, 14 species of birds, and 5 species of mammals). The only amphibians that were found in and adjacent to the Project site were the Pacific treefrog (*Hyla regilla*) and bullfrog (*Rana catesbeiana* = *Lithobates catesbeianus*). Both of these species are relatively widespread in lower elevation drainages, ponds, and other waters in California. The only reptile species recorded within the BSA was the western fence lizard (*Sceloporus occidentalis*). This species is relatively widespread within the non-desert, lowland portions of California. The bird species recorded within the BSA included phainopepla (*Phainopepla nitens*), northern mockingbird *(Mimus polyglottos*), Nuttall's

woodpecker (*Picoides nuttallii*), American robin (*Turdus migratorius*), willow flycatcher (*Empidonax traillii*), Pacific-slope flycatcher *(E. difficilis*), house finch (*Haemorhous mexicanus*), western scrub-jay (*Aphelocoma californica*), Anna's hummingbird (*Calypte anna*), northern flicker (*Colaptes auratus*), turkey vulture (*Cathartes aura*), killdeer (*Charadrius vociferus*), black phoebe (*Sayornis nigricans*), and California quail (*Callipepla californica*). Most of these species are common and widespread year-round or winter residents within oak and riparian woodlands within the region. However, the willow flycatcher and Pacific-slope flycatcher are only migrants through the area and do not occur as a nesting or wintering species within the BSA. Lastly, mammal species documented within the BSA included California ground squirrel (*Otospermophilus beecheyi*) (burrows only), Botta's pocket gopher (*Thomomys bottae*) (mounds only), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and raccoon (*Procyon lotor*) (tracks only).

Other wildlife species may occur within the BSA, but were not identified during the surveys. These other species include, but are not limited to, southern alligator lizard (*Elgaria multicarinata*), western skink (*Plestiodon skiltonianus*), common kingsnake (*Lampropeltis getula*), Pacific gopher snake (*Pituophis catenifer*), Northern Pacific rattlesnake (*Crotalus oreganus*), several species of small mammals, several species of oak or riparian-associated passerines (i.e., songbirds), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*). These other wildlife species are not considered "sensitive species" or "special status species".

Special-Status Wildlife Species

A likelihood of occurrence analysis for special-status wildlife species that could occur within the BSA was conducted as part of the *Biological Resources Evaluation* and updated in *Addendum No. 1* (see Appendix D2 of this DEIR). Of these species, the analysis found that 15 species of special-status wildlife have some potential to occur within the BSA. These special-status wildlife are presented in Table 3.4-1 below. The Valley Elderberry Longhorn Beetle (VELB) was included on this Table 3.4-1, even though there is no potential for it to occur on the Project site or the BSA. This was done to simply emphasize the point that VELB in not present at the Project site.

Wildlife Movement Corridors

Riparian corridors often function as wildlife movement corridors for many species of wildlife given the presence of water, vegetative cover, and vegetative structure and the lack of such habitat on adjacent lands that have been fragmented by roads, development, agriculture, or other uses. The Kaweah and St. Johns River corridors provide such habitat (especially for deer, medium to large-size carnivores, and migratory birds). Though there is no data to suggest that these riparian corridors are uniquely important for the passage of any given species, the corridors do provide habitat that is used by a wide variety of species during seasonal migration, dispersal of juveniles, and movement between parts of home range that may otherwise be fragmented. Much of the river corridor that is adjacent to the Project site has little vegetative cover and the lack of vegetative cover likely limits the movement of some species through the area. However, given the adjacent open space, passage by species can still occur along the river under cover of darkness (regardless of the lack of vegetation). There are no established native resident or

migratory wildlife corridors within or adjacent to the Project site, nor are there known native wildlife nursery sites within BSA.

Table 3.4-1. Special-Status Wildlife Species with Potential to Occur within the BSA

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lytta moesta	Moestan blister beetle	None / SA / None	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring within the BSA. Therefore, it is considered to have some potential, albeit low, to occur in the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lytta morrisoni	Morrison's blister beetle	None / SA / None	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring within the BSA. Therefore, it is considered to have some potential, albeit low, to occur in the BSA.
Desmocerus californicus dimorphus	valley elderberry longhorn beetle (VELB)	FT / None / None	Until recently, this subspecies was thought to occur at scattered locations in the Central Valley and adjacent foothills of the Sierra Nevada and Coast Ranges. It is entirely dependent upon its host plant (i.e., elderberry spp.) and is only found where this shrub occurs (typically in riparian vegetation associations, but occasionally in single, isolated shrubs or stands of the plant).	**No Potential.** The BSA supports a large number of old-growth elderberry shrubs (see Figure 3.4-1). Although bona fide exit holes of *Desmocerus* sp. were observed on 13 individual elderberry plants, it is highly likely they are from the unlisted California elderberry longhorn beetle (CELB). Based on the newly published VELB rule, Tulare County has been excluded from the geographic range of the VELB. Therefore, VELB is considered to have no potential to occur within the BSA. (see Federal Register, Vol. 79, No. 180, Part II, USDI, FWS, 50 CFR Part 17: "...*it is reasonable to conclude that the Tulare County observations likely represent the California elderberry longhorn beetle.*")

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Chrysis tularensis	Tulare cuckoo wasp	None / SA / None	This species is known only from a small series of specimens that have been collected in Amador, Fresno, Monterey, and Tulare counties. Cuckoo wasps are nest parasitoids of predatory wasps and sawflies. However, the host species of this species are unknown. Adults have been found from April to June in open, sunny habitats with abundant flowers and small shrubs, where they feed on nectar.	**Low Potential.** Given that predatory wasps and sawflies (i.e., wasp's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring within the BSA. Furthermore, the nearest known record to the BSA is from immediately north of the intersection of Road 212 and Avenue 344 (less than 3 miles from the BSA). Therefore, it is considered to have some potential, albeit low, to occur within the BSA.
Actinemys marmorata *(*formerly *Emys marmorata*)	western pond turtle	None / CSC / None	This species historically occurred throughout most of the Pacific-slope drainages in California (below approximately 4,000 feet). The species now occurs at scattered locations throughout its former range (primarily in the central Sierra Nevada foothills, Central Valley, San Francisco Bay area, and north-central coast and Coast Ranges). It occurs in and adjacent to ponds, reservoirs, or other slow-moving perennial aquatic habitats (e.g., sloughs, streams, and rivers). The species may be active year-round in some parts of its range.	**Low Potential.** Given that potentially suitable habitat is provided by the adjacent Lower Kaweah River and St. Johns River and the species has been recorded upstream in the Kaweah River, it cannot be discounted as occurring within the BSA. Suitable aquatic habitat within the BSA only occurs in the Lower Kaweah River and St. Johns River. However, individuals could also enter the upland portions of the BSA for egg-laying. Therefore, it is considered to have some potential, albeit low, to occur within the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Anniella pulchra	Northern California legless lizard	None / CSC / None	This species occurs as a fossorial species in sand, sandy loam, or leaf-mold substrates. It can be found in a variety of habitats that include coastal beach, chaparral, pine-oak woodland, and riparian habitats. Soil moisture is essential. It appears to be active mostly during the morning and evening, just beneath the surface of sunlight-warmed substrate. It may also be active on the surface at night when substrate temperatures remain warm for extended intervals. It should be noted that recent mitochondrial and nuclear DNA work has resulted in the species being split into five distinct species with the local species (*A. pulchra*) occurring only along the coast, in the Coastal Ranges as far south as northwestern Ventura County and in parts of the San Joaquin Valley.	**Low Potential.** No individuals of this species were observed during the reconnaissance-level surveys of the BSA. However, there is a relatively recent occurrence (2015) documented in the CNDDB from about 0.2 miles northwest of Highway 198 at Road 180, in the vicinity of Outside Creek and Johnson Slough, about 6.5 miles east of Visalia.in the Kaweah Oaks Preserve. Therefore, given the presence of suitable habitat (primarily on the Project site), the species is considered to have some potential, albeit low, to occur within the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Accipiter cooperii	Cooper's hawk (nesting)	None / SA / None	This species occurs as an uncommon breeding resident throughout most of the low to mid-elevation wooded portions of California where it inhabits open, interrupted, or marginal woodlands. It is seldom found in areas without dense tree stands. Nest sites are typically found in riparian or deciduous trees in canyon bottoms or river flood plains.	**Low Potential.** There is suitable nesting habitat for the species (i.e., interrupted riparian woodland with dense stands of trees) located in the southeastern portion of the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 2 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest within the BSA.
Buteo regalis	ferruginous hawk (wintering)	None / None / BCC	This species is a winter resident of the Modoc Plateau, Central Valley, and Coast Ranges. It forages in large, open tracts of grasslands, sparse scrubland, and deserts.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Elanus leucurus	white-tailed kite (nesting)	None / CFP / None	This species is found as a resident throughout the lower elevation portions of California in low rolling grasslands with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. It requires grasslands, meadows, or marshes (for foraging) located near dense-topped trees (for nesting and roosting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the BSA. In addition, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest within the BSA.
Falco columbarius	merlin (wintering)	None / SA / None	This species winters in California from September to May. It occurs in a variety of low elevation, relative flat habitats that include wooded areas, coastlines, open grasslands, savannah, and the periphery of lakes. It is less often found in open desert. It typically requires dense stands of trees for cover and roosting. It is most often found where there are substantial populations of small birds (the primary prey item).	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Aquila chrysaetos	golden eagle (wintering)	None / CFP / BCC	Found as a breeding resident throughout most of California (other than the valley floor of the Central Valley). Also found as a wintering species throughout most of California (other than the high Sierra Nevada). Species requires open terrain for hunting (e.g., grassland, oak savannah, and early successional stages of shrub and woodland habitats). Typically nests on secluded cliffs, but may also use large, isolated trees.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Athene cunicularia	burrowing owl (burrow sites)	None / CSC / BCC	This species is found throughout the Central Valley, in the San Francisco Bay Area, at scattered locations along the coast, and in portions of the desert regions. It is a year-round resident in annual and perennial grasslands or other vegetation communities that support sparse or non-existent tree or shrub canopies.	**Low Potential.** Though the annual grassland on the Project site provides suitable foraging habitat for the species, there is no evidence of suitable burrow sites (i.e., no California ground squirrels or their burrows, nor were other suitable burrow surrogates observed on the Project site). However, California ground squirrel burrows were observed in the spoils materials from the adjacent sand and gravel mining operations and along the existing access road on the Seaborn site. Therefore, the species is considered to have some potential, albeit low, to occur within the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lanius ludovicianus	loggerhead shrike (nesting)	None / CSC / BCC	This species is found as a resident and wintering species throughout the lower elevation portions of California in grasslands, saltbush scrub, chaparral, oak savannah, and other open woodland types (generally, where there are trees with dense cover for nesting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland with dense stands of trees) located in the southeastern portion of the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 2 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest within the BSA.
Baeolophus inornatus	oak titmouse (nesting)	None / None / BCC	This species occurs as a common resident throughout much of California other than the deserts, high Sierra Nevada, and redwood belt. It is generally found in cismontane woodland (particularly oak or riparian woodlands) where it nests in the cavities created by woodpeckers.	**Moderate Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) in the southeastern portion of the BSA. Furthermore, there are potential nest sites (i.e., woodpecker-created nest holes) in this woodland. Lastly, there are records from the project vicinity in the eBird data base (i.e., less than 2 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have a moderate potential to occur within the BSA.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Spinus lawrencei	Lawrence's goldfinch (nesting)	None / None / BCC	This species is found as a breeding species in oak woodlands, other arid woodlands, and chaparral in the lower elevations of northern California and in riparian woodland, pinyon-juniper woodland, and lower montane communities in southern California. A local water source and a source of abundant seeds are required habitat components.	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the BSA. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 2 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest within the BSA.
Vulpes macrotis mutica	San Joaquin kit fox	FE / ST/ None	This taxon is found in the San Joaquin Valley from Contra Costa County south to Kern County. It is also found in the dry interior valleys of the Coast Ranges (e.g., Salinas and Santa Clara valleys). It occurs in open, sparsely vegetated areas of low relief (typically in native or non-native grassland or alkali sink scrub).	**Low Potential**. Though there is suitable habitat for the taxon within the BSA (i.e., non-native annual grassland), and it has been recorded 2.7 miles northwest and 4.8 miles southwest of the Project site, surveys of the annual grassland within the BSA found no potential dens or other evidence of the taxon to suggest it occurs within the BSA. In addition, the sandy soils on the Project site may preclude the creation and maintenance of burrows that do not easily collapse (hence the lack of California ground squirrel burrows). Therefore, the taxon is considered to have only a low potential to occur in the annual grassland associated with the easternmost and northernmost portions of the BSA.

FEDERAL	
FE	Federally listed as Endangered
FT	Federally listed as Threatened
FPE	Federally proposed as Endangered
FPT	Federally proposed as Threatened
FC	Federal Candidate Species (former Category 1 candidates)
BCC	U.S. Fish and Wildlife Service designated "Birds of Conservation Concern" 2008
STATE	
SE	State listed as Endangered
ST	State listed as Threatened
SR	State listed as Rare
CFP	California Department of Fish and Game designated "Fully Protected"
CSC	California Department of Fish and Game designated "Species of Special Concern"
SA	California Department of Fish and Game designated "Special Animal"
OTHER	
CNPS List 1A	Plants presumed extinct in California
CNPS List 1B	Plants that are rare, threatened, or endangered in California and elsewhere
CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere
CNPS List 3	Plants about which we need more information – a review list
CNPS List 4	Plants of limited distribution – a watch list
CNPS Threat Rank 0.1	Seriously threatened in California (high degree/immediacy of threat)
CNPS Threat Rank 0.2	Fairly threatened in California (moderate degree/immediacy of threat)
CNPS Threat Rank 0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)
LIKELIHOOD OF OCCURRENCE DEFINITIONS	
Known to Occur	Taxon was observed within or immediately adjacent to the project site or has previously been documented within or immediately adjacent to the project site.
High Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on more than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.

Genus / Species	Common Name	Status Federal / CA / Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Moderate Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on less than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.			
Low Potential	Taxon has not been documented within or immediately adjacent to the project site nor is it likely to occur on or near the project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.			
No Potential	Taxon does not occur within or immediately adjacent to the project site due to the lack of required habitat features for the taxon, or the known range of the taxon is well defined and does not include the project vicinity.			

Protected Trees

Tulare County currently does not have a tree ordinance that protects specific types of trees. However, the adopted policies of the Environmental Resources Management Element (ERM-1.12) of the Tulare County General Plan – 2030 Update states that "*the County shall support the conservation and management of oak woodland communities and their habitats*" (Tulare County, 2012). As can be seen by comparing the proposed excavation area to the existing oak-riparian woodland on Figure 3.4-1, the Project would not result in the removal of the oak woodland community or its habitat therefore, the Project is consistent with the General Plan by conserving this area of the Project site.

Sensitive Habitats

The only sensitive habitats that occur within the BSA and specifically on the Project site are the mixed oak-riparian woodland that is found in the southeastern portion of the Project site and the adjacent elderberry savannah. The mixed oak-riparian woodland is classified as Great Valley Mixed Riparian Forest in the Natural Communities List in *A Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf and Evens, 2009), and is tracked by the CDFW as a sensitive natural community in the CNDDB. The elderberry savannah is classified as Elderberry Savanna in the Natural Communities List. It is also tracked by the CDFW in the CNDDB.

Aquatic Resources, Wetlands and Jurisdiction Waters

The jurisdictional waters that are associated with the BSA and Project site are the Lower Kaweah River and St. Johns River. Each of these drainages are subject to both state and federal jurisdiction under the California Fish and Game Code, Porter-Cologne Act, and Clean Water Act. An official jurisdictional waters determination was not made for the Lower Kaweah River and St. Johns River because it is assumed both rivers meet the requirements as federal and state jurisdictional waters and the associated permitting actions are required.

3.4.3 Regulatory Setting

3.4.3.1 Federal

Federal Endangered Species Act (ESA) (16 U.S.C. §§1531-1544)

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction (16 U.S.C. § 1531 et seq.). The FESA can be implemented in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend (42 U.S.C. § 4321 et seq.).

The FESA prohibits the "take" of endangered or threatened wildlife species without an authorized take permit from the United States Fish and Wildlife Service (USFWS) (16 U.S.C. § 1538(a)(1)(B)). "Take" is defined to include harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to

engage in such conduct (16 U.S.C. § 1532(19), 50 CFR 17.3). Actions that result in unauthorized take can result in civil or criminal penalties.

Clean Water Act (33 U.S.C. 1251-1376)

The Clean Water Act (CWA) governs the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters (33 U.S.C. § 1251 et seq). Section 404 of the CWA establishes a permit program, administered by the U.S. Army Corps of Engineers (ACOE), regulating discharge of dredged or fill materials into waters of the U.S., including wetlands. Implementing regulations by the Corps are found at 33 C.F.R. Parts 320–330. Implementing regulations were also developed by the United States Environmental Protection Agency (USEPA) in conjunction with ACOE, which are found at 40 C.F.R. Part 230. The regulations allow the discharge of fill materials into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Water Quality Certification (Clean Water Act Section 401)

The State Water Resources Control Board (SWRCB) has authority to implement Section 401 of the CWA, as well as the Porter-Cologne Act, California Code of Regulations Title 23, Section 3831(k), and California Wetlands Conservation Policy. The CWA requires that an applicant for a Federal Section 404 permit from ACOE (to discharge dredged or fill material into waters of the U.S.) first obtain a certificate from the appropriate State agency stating that the project is consistent with the State's water quality standards and criteria. In California, the authority to either grant or waive certification is delegated by the SWRCB to the Regional Water Quality Control Boards (RWQCB) (Cal. Water Code § 13370 et seq). A request for certification or waiver is submitted to the RWQCB at the same time that while an application is filed with the ACOE for a Section 404 Permit. The RWQCB then has 60 days to review the application and act on it. Because no ACOE permit is valid under the CWA unless "certified" by the State, the RWQCBs may effectively veto or add conditions to an ACOE permit.

In this instance, the Central Coast Valley RWQCB requires 401 Certification because the Project falls into the following category:

1. Projects involving discharges of dredged or fill material to waters of the United States including wetlands and other water bodies. Such discharges may result from navigational dredging, flood control channelization, levee construction, channel clearing, fill of wetlands for development, or other activities.

   These projects involve the removal or placement of soil, sediment, and other materials in or near water bodies and require Corps permits under CWA Section 404.

Regulation of Discharge (Clean Water Act Section 404)

Under Section 404 of the CWA, the ACOE has the authority to regulate activity that could discharge fill or dredge material or otherwise adversely modify wetlands or other waters of the U.S. (Cal. Water Code § 13376). The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The ACOE implements the Federal policy embodied in Executive Order 11990 (May

24, 1977), which is intended to result in no net loss of wetland values or function. Wetlands under ACOE jurisdiction must be "relatively permanent" and have a "significant nexus" to a traditionally navigable water (Rapanos v. US [2006] 547 U.S. 715.). To determine the extent of ACOE-jurisdictional waters on a project site, an applicant must delineate the property using the methodology presented in the 1987 U.S. Corps of Engineers Wetland Delineation Manual, delineation which is then verified by the ACOE.

On May 27, 2015, the U.S. EPA and the ACOE finalized the Clean Water Rule. Specifically, the Clean Water Rule aimed to do the following:

- ***Clearly defines and protects tributaries that impact the health of downstream waters.*** *The Clean Water Act protects navigable waterways and their tributaries. The rule says that a tributary must show physical features of flowing water – a bed, bank, and ordinary high-water mark – to warrant protection. The rule provides protection for headwaters that have these features and science shows can have a significant connection to downstream waters.*
- ***Provides certainty in how far safeguards extend to nearby waters.*** *The rule protects waters that are next to rivers and lakes and their tributaries because science shows that they impact downstream waters. The rule sets boundaries on covering nearby waters for the first time that are physical and measurable.*
- ***Protects the nation's regional water treasures.*** *Science shows that specific water features can function like a system and impact the health of downstream waters. The rule protects prairie potholes, Carolina and Delmarva bays, pocosins, western vernal pools in California, and Texas coastal prairie wetlands when they impact downstream waters.*
- ***Focuses on streams, not ditches.*** *The rule limits protection to ditches that are constructed out of streams or function like streams and can carry pollution downstream. So, ditches that are not constructed in streams and that flow only when it rains are not covered.*
- ***Maintains the status of waters within Municipal Separate Storm Sewer Systems.*** *The rule does not change how those waters are treated and encourages the use of green infrastructure.*
- ***Reduces the use of case-specific analysis of waters.*** *Previously, almost any water could be put through a lengthy case-specific analysis, even if it would not be subject to the Clean Water Act. The rule significantly limits the use of case-specific analysis by creating clarity and certainty on protected waters and limiting the number of similarly situated water features.*

"The rule ensures that waters protected under the Clean Water Act are more precisely defined and predictably determined, making permitting less costly, easier, and faster for businesses and industry. The rule is grounded in law and the latest science and is shaped by public input. The rule does not create any new permitting requirements for agriculture and maintains all previous exemptions and exclusions."

Migratory Bird Treaty Act (16 U.S.C. §§703-712)

The Migratory Bird Treaty Act (MBTA) governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests (16 U.S.C. § 703(a)). The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over-utilization. Migratory birds are also protected, as defined in the MBTA, under Section 3513 of the California Fish and Game Code. In addition, Section 3503 of the California Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird, except as otherwise provided by the California Fish and Game Code or other regulations.

Executive Order 13186 (January 11, 2001), which addresses the responsibilities of Federal agencies to protect migratory birds, requires that any project with Federal involvement address the impacts of any associated Federal actions on migratory birds. The order is designed to assist Federal agencies in their efforts to comply with the MBTA and does not constitute any legal authorization to take migratory birds. The order also requires Federal agencies to work with the USFWS to develop a memorandum of understanding (MOU). Protocols developed under the MOU must promote the conservation of migratory bird populations through the following means:

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
- Restore and enhance habitat of migratory birds, as practicable; and prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable

Consistent with the text, purpose, and history of the MBTA, a final rule ([Docket No. FWS–HQ–MB–2018–0090; FF09M22000–201–FXMB1231090BPP0]) was issued on January 7, 2021 that clarifies that activity resulting in unintentional (incidental) injury or death of migratory birds is not prohibited under the MBTA. This rule is intended to provide regulatory certainty to the public, industries, states, tribes, and other stakeholders about implementation of the MBTA and best practices for conservation.

This rule reaffirms the original meaning and intent of the MBTA by making it clear that the USFWS will not prosecute landowners, industry, and other individuals for accidentally killing a migratory bird. This opinion has been adopted by several courts, including the U.S. Court of Appeals for the Fifth Circuit.

This final rule codifies the 2017 Department of the Interior Solicitor's Office Opinion M-37050 to provide a uniform approach that incidental take of birds resulting from an activity is not prohibited when the underlying purpose of that activity is not to take birds. This is consistent with the interpretation of several federal courts, including a 2015 ruling by the Fifth Circuit Court of Appeals. The rule does not take effect until February 6, 2021 and so may be suspended by the incoming Biden Administration. In addition, the 117th Congress may introduce legislation that seeks to clarify the scope of the MBTA at the statutory level. Whether or not incidental take of birds will result in criminal risk exposure therefore remains unsettled for the foreseeable future.

Executive Order 11990 - Protection of Wetlands (42 FR 26961-26965, May 25, 1977)

Executive Order 11990 requires Federal agencies to provide leadership and take action to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural qualities of these lands. Federal agencies are required to avoid undertaking or providing support for new construction located in wetlands unless (1) no practicable alternative exists, and (2) all practical measures have been taken to minimize harm to wetlands.

Federal Register (Vol 79, No 180) – Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to Remove the Valley Elderberry Longhorn Beetle from the Federal List of Endangered and Threatened Wildlife; Proposed Rule

In 2012, the USFWS proposed to remove the valley elderberry longhorn beetle (VELB) from the Federal list of Endangered and Threatened Wildlife. After further evaluation of new information that became available since publication of that proposal, the USFWS has withdrawn that proposed rule such that the VELB is still considered Federally listed as endangered and threaten. However, they also revised the presumed historical range of the VELB to no longer include the Tulare County. As stated in the 2021 proposed rule change:

> *"With regard to recorded CNDDB observations of valley elderberry longhorn beetle in Tulare County, it is important to note that there is significant uncertainty as to whether the male and female adult beetles observed in that area represent observations of the valley elderberry longhorn beetle or the California elderberry longhorn beetle (CNDDB EOs 63, 66, 128, 154). Based on the distribution map prepared by Chemsak (2005, pp. 6–7) and the discussion (and map) presented in Talley et al. (2006a, pp. 5–6), it is reasonable to conclude that the Tulare County observations likely represent the California elderberry longhorn beetle."*

A copy of the Federal Register and revised map of the VELB range is provided in Appendix D.

3.4.3.2 State

California Environmental Quality Act

Although threatened and endangered species are protected by specific Federal and State statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on the Federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. These criteria allow a public agency to undertake a review to determine if there would be significant effects to species that have not yet been listed by either the USFWS or CDFW (i.e., Species of Special Concern).

California Endangered Species Act (CESA) (Cal. Fish & Wildlife Code §2050 et seq)

The State of California enacted the California Endangered Species Act (CESA) in 1984 (Cal. Fish & Game Code § 2050 et seq). The CESA is similar to the FESA but pertains to State-listed endangered and

threatened species. It establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats, and requires lead agencies to consult with the CDFW when preparing CEQA documents to ensure that the Lead Agency actions do not jeopardize the existence of listed species if reasonable and prudent alternatives are available that would avoid jeopardy. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the Project consistent with conserving the species.

CESA prohibits the taking of State-listed endangered or threatened plant and wildlife species without an authorized take permit from CDFW (Cal. Fish & Game Code §2080). CDFW may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFW requires preparation of mitigation plans in accordance with published guidelines.

For projects that affect both state- and federally listed species, compliance with FESA satisfies CESA, if CDFW determines that the Federal incidental take authorization is consistent with CESA under Fish and Game Code Section 2080.1. For projects that result in a "take" of a State-only listed species, the Lead Agency may apply for a take permit under Fish and Game Code Section 2081(b).

CDFW Species of Concern

In addition to species formally listed under the ESA and the CESA, "species of special concern" receive consideration by CDFW and local lead agencies during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern," developed by CDFW. It tracks species in California whose breeding populations in California may be decreasing or facing local extirpation. To avoid the future need to list these species as endangered or threatened, CDFW recommends consideration of these species, which do not yet have any legal status, during analysis of the impacts of projects.

Birds of Prey (Cal. Fish & Wildlife Code § 3503.5)

Birds of prey are also protected in California under provisions of the Fish and Wildlife Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (bird-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

Stream Alteration (Cal. Fish & Wildlife Code § 1601 – 1603)

Under Fish and Game Code Sections 1601 – 1603, a lead agency must notify CDFW prior to implementing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake (Cal. Fish & Game Code §1601-1603). Preliminary notification and project review generally

occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications may be formalized in a Lake and Streambed Alteration Agreement (LSAA).

Porter-Cologne Water Quality Control Act (Water Code 13000 et seq)

The Porter-Cologne Water Quality Control Act charges the SWRCB and nine RWQCBs with protecting water quality throughout California. Typically, the SWRCB and RWQCB act in concert with the ACOE under Section 401 of the CWA in relation to permitting fill of Federally jurisdictional waters (Cal. Water Code §13000 et seq). Waters of the State are defined in Section 13050(e) of the Porter-Cologne Water Quality Control Act as "*…any surface water or groundwater, including saline waters, within the boundaries of the state.*" In cases where an area meets the criteria to be considered a wetland, but the ACOE does not have jurisdiction, the applicant is referred to the appropriate RWQCB. The Porter-Cologne Act contains a complete framework for the regulation of waste discharges to both surface waters and groundwaters of the State through the issuance of Waste Discharge Requirements (WDRs) by the RWQCB.

Surface Mining and Reclamation Act of 1975, as Amended (Public Resources Code 2710-2796)

The Surface Mining and Reclamation Act (SMARA) requires a process of reclamation after mining, which includes maintaining water and air quality, and minimizing flooding, erosion and damage to wildlife and aquatic habitats caused by surface mining. Reclamation activities must comply with the reclamation performance standards prescribed under 14 CCR § 3700-3713. These include performance standards for:

- Financial Assurances (§3702).
- Wildlife Habitat (§3703).
- Backfilling, Regrading, Slope Stability, and Recontouring (§3704).
- Revegetation (§3705).
- Drainage, Diversion Structures, Waterways, and Erosion Control (§3706).
- Prime Agricultural Land Reclamation (§3707).
- Other Agricultural Land (§3708).
- Building, Structure and Equipment Removal (§3709).
- Stream Protection, Including Surface and Groundwater (§3710).
- Topsoil Salvage, Maintenance, and Redistribution (§3711).
- Tailing and Mine Waste Management (§3712).
- Closure of Surface Openings (§3713).

Native Plant Protection Act (Cal. Fish & Wildlife Code § 1900 – 1913)

California's Native Plant Protection Act of 1977 requires all State agencies to use their authority to carry out programs to conserve endangered and rare native plants (Cal. Fish & Game Code § 1900 et seq). Provisions of this Act prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use which would adversely impact listed plants. This allows CDFW to require the salvaging of listed plant species that would otherwise be destroyed.

3.4.3.3 Local

Tulare County General Plan (2012)

The Tulare County General Plan – 2030 Update (Tulare County, 2012) identifies environmental, social and economic goals for the region, and sets forth policies, standards, and programs to guide physical development within the County. The goals and policies for the protection of wildlife and other biological resources from the General Plan Environmental Resource Management (Chapter 8) element listed below are relevant to the Project.

SECTION 8.1 – BIOLOGICAL RESOURCES

Goal ERM-1: To preserve and protect sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County.

Policy ERM-1.1 – Protection of Rare and Endangered Species: The County shall ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by state and/or federal government, through compatible land use development.

Policy ERM-1.2 – Development in Environmentally Sensitive Areas: The County shall limit or modify proposed development within areas that contain sensitive habitat for special status species and direct development into less significant habitat areas. Development in natural habitats shall be controlled so as to minimize erosion and maximize beneficial vegetative growth.

Policy ERM-1.4 – Protect Riparian Areas: The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.

Policy ERM-1.5 – Riparian Management Plans and Mining Reclamation Plans: The County shall require mining reclamation plans and other management plans to include measures that protect, maintain, and restore riparian resources and habitats.

Policy ERM-1.6 – Management of Wetlands: The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.

Policy ERM-1.7 – Planting of Native Vegetation: The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.

Policy ERM-1.8 – Open Space Buffers: The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and

natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state.

Policy ERM-1.12 – Management of Oak Woodland Communities: The County shall support the conservation and management of oak woodland communities and their habitats.

Policy ERM-1.14 – Mitigation and Conservation Banking Program: The County shall support the establishment and administration of a mitigation banking program, including working cooperatively with TCAG, federal, state, not-for-profit and other agencies and groups to evaluate and identify appropriate lands for protection and recovery of threatened and endangered species impacted during the land development process.

Policy ERM-1.15 – Minimize Lighting Impacts: The County shall ensure that lighting associated with new development or facilities (including street lighting, recreational facilities, and parking) shall be designed to prevent artificial lighting from illuminating adjacent natural areas at a level greater than one foot candle above ambient conditions.

Policy ERM-1.16 – Cooperate with Wildlife Agencies: The County shall cooperate with State and federal wildlife agencies to address linkages between habitat areas.

Policy ERM-1.17 – Conservation Plan Coordination: The County shall coordinate with local, state, and federal habitat conservation planning efforts (including Section 10 Habitat Conservation Plan) to protect critical habitat areas that support endangered species and other special-status species.

3.4.4 Significance Thresholds

3.4.4.1 Appendix G Thresholds of Significance

Significant impacts to biological resources would occur if the Project would:

a) *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;*

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;*

c) *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filing, hydrological interruption, or any other means;*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*

e) Conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance; or

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

3.4.4.2 Additional Thresholds of Significance

In addition to the CEQA Appendix G criteria described in Section 3.4.4.1, mandatory findings of significance are required under CEQA Guidelines Section 15065 if there is substantial evidence, in light of considering the whole record, that the Project may cause any of the following conditions to occur:

- Substantially reduce the habitat of a fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community; or
- Reduce the number or restrict the range of an endangered, rare, or threatened species.

CEQA Guidelines Section 15380 provides that a plant or animal species may be treated as "endangered, rare, or threatened" even if not on an official list of such species if, for example, it is likely to become endangered or rare in the foreseeable future or can otherwise be shown to meet the criteria for "rare" or "endangered" species.

Other requirements identified in the County policies and plans are addressed by the significance criteria(s) described above. There are no additional thresholds of significance related to the topical environmental issue.

3.4.5 Methodology of Analysis

In this analysis, three (3) components were considered:

- Magnitude of the impact (i.e., substantial/not substantial);
- Uniqueness of the affected resource (i.e., rarity of the resource); and
- Susceptibility of the affected resource to perturbation (i.e., sensitivity of the resource).

The evaluation of the significance of the following impacts considered the interrelationship of these three components. For example, a relatively small magnitude impact to a state or federally listed species would be considered significant, because the species is rare and is believed to be very susceptible to disturbance. Conversely, a plant community such as non-native annual grassland is not necessarily rare or sensitive to disturbance. Therefore, a much larger magnitude of impact would be required to result in a significant impact.

The BSA included the Project site, the existing access road located on the Seaborn site and adjacent areas (within 250-feet). A review was conducted of the available information on special-status species, wildlife habitats, vegetation communities, and waters that are subject to state or federal jurisdiction that are known to occur within the BSA. This review was supplemented with reconnaissance-level field surveys

conducted on May 16, 2011 and September 18, 2013 to validate which of these resources (or other resources) are associated with the Project site. On October 15, 2020, an updated survey was conducted within the BSA that also addressed the access road and adjacent land on the Seaborn site.

Sources of information utilized in the evaluation of biological resources include the following:

- California Natural Diversity Database, Rarefind 5 computer program (CDFW 2021), query for the Woodlake and surrounding Stokes Mtn., Ivanhoe, Exeter, Aukland, Rocky Hill, Shadequarter Mtn., Kaweah, and Chickencoop Canyon California 7.5-minute topographic quadrangles (U.S. Department of the Interior, Geological Survey, 1979 and 1980);
- eBird Data Base (http://ebird.org/ebird/eBirdReports?cmd=Start) (2021);
- Special Vascular Plants, Bryophytes, and Lichens List (CDFW, January 2021);
- Special Animals List (CDFW, July 2020);
- California Native Plant Society Inventory of Rare and Endangered Plants (online edition) (CNPS, 2020);
- The Calflora Database (http://www.calflora.org/) (2020);
- Consortium of California Herbaria (http://ucjeps.berkeley.edu/consortium/) (2020);
- A Manual of California Vegetation (Sawyer, Keeler-Wolf and Evens, 2009);
- Kaweah River Rock Company Revised Draft Environmental Impact Report (Jones & Stokes Associates, Inc., 1997);
- *Tulare Irrigation District McKay Point Reservoir Biological Resources Report, Tulare, California* (Bumgardner Biological Consulting, 2013) (see Appendix D1);
- *Elderberry Inventory Report for the Proposed Reservoir of the Tulare County Irrigation District at McKay Point Near Visalia, California* (Entomological Consulting Services, Ltd., 2014) (see Appendix D3);
- Section 7 Consultation on the McKay Point Check Structures Project, Tulare County, California (SPK-2009-152) (USFWS 2009) (Appendix D and its enclosures); and
- McKay Point Reservoir Project Biological Resources Evaluation, Addendum No. 1 (Bumgardner Biological Consulting, 2021) (see Appendix D2).

A list of special-status species that are likely to occur within the BSA, or be affected by the Project, was derived from a CNDDB query, review of various botanical databases listed above, and the professional experiences and opinions of Bumgardner Biological Consulting. These special-status species are identified in the *Tulare Irrigation District McKay Point Reservoir Biological Resources Report* (Appendix D1) and as updated in the January 2021 Addendum No. 1 (see Appendix D2).

Potential impacts to biological resources from the Project have been assessed based on site reconnaissance surveys to determine what habitats (i.e., vegetation communities, wetlands and other aquatic resources, or other habitat structures) occur within the BSA and comparison with the known ecology and distribution of the special-status species that occur in the region.

The BSA was surveyed by Bumgardner Biological Consulting on May 16, 2011, September 18, 2013, and October 12, 2020. The surveys were conducted on foot as random meander transects such that all portions of the BSA could be effectively evaluated. A search for special-status plant and wildlife species was conducted and focused on local taxa that have been recorded in the CNDDB or CNPS Online Inventory of Rare and Endangered Plants. A reconnaissance-level search for waters with regulatory jurisdiction under the CWA, California Fish and Game Code and/or Porter Cologne Water Quality Control Act was conducted within the Project site boundaries.

An inventory of the resident elderberry plants was conducted in April 2014. Inventory data were collected in accordance with the procedures described in the VELB Conservation Guidelines (USFWS 1999).

A Biological Resources Report (Bumgardner Biological Consulting, 2013) and Elderberry Inventory Report (Entomological Consulting Services, Ltd., 2014) were prepared and are provided in Appendix D, respectively. During personal communication with Dr. Richard A. Arnold, Entomological Consulting Services, Ltd. and Michael Bumgardner, Bumgardner Biological Consulting on March 21, 2016, the USFWS Ruling in the September 17, 2014 Federal Register Rule regarding the range of the VELB was discussed. Both Dr. Arnold and Mr. Bumgardner were in agreement that based on the September 17, 2014 Rule, there would be no potential for the presence of VELB on the Project site.

CEQA requires that projects analyze potential impacts on special-status plant and animal species, as well as on sensitive habitats, wildlife corridors, and waters of the United States. Impacts on wildlife species that are not considered special-status are generally not considered significant unless the impacts are associated with the species' migration or movement routes, other important habitats (e.g., avian nesting rookeries), or the species is considered locally important.

3.4.5.3 Project Design Features and Environmental Protection Measures

Numerous design features, best management practices (BMPs), operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. Some of the protective measures that directly relate to biological resources are as follows:

1. Employee training programs will be conducted to educate personnel of sensitivity issues including but not limited to biological resources/habitat resources.
2. Operations would occur primarily during daylight hours. Operations during the time of year when daylight hours are shorter, or for any evening/nighttime operations, would require lighting to provide a safe operating environment. For evening/nighttime lighting, high pressure sodium

and/or cut-off fixtures (or equivalent International Dark-Sky Association [IDA]-approved fixtures) would be used instead of mercury-vapor fixtures for any required nighttime lighting. The lighting would also be designed to confine illumination to the Project site, and/or to areas that do not include light-sensitive uses.

3. BMPs (e.g., gravel bag or rock check dams along drainage swales, silt fencing or fiber rolls to contain drainage and sediment, lined swales, etc.) would be implemented to prevent stormwater runoff in accordance with the Project Storm Water Pollution Prevention Plan (SWPPP).

4. Blasting would not be used for the excavation phase of the Project.

5. A Protection and Monitoring Plan would be prepared, if necessary, to address the mitigation measures identified below in Section 3.4.6.

3.4.6 Project-Level Impacts and Mitigation Measures

3.4.6.1 Adverse Effects on Special-Status Species

Impact Statement

Impact BIO-1: *Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?* **(CEQA Guidelines Threshold Criteria (a))**

Impact Analysis

Much of the native vegetation within the BSA has been replaced by introduced species or has been eliminated due to past cattle grazing activities. As discussed in Section 3.4.2.3 and/or shown on Table 3.4-1, there were no special-status plant species observed within the BSA. However, 2 sensitive vegetation communities were documented as occurring within the BSA, while 15 special-status species of wildlife were considered to have some potential to occur within the BSA. As shown on Figures 2-4 and 2-5 in Section 2.0 – Project Description, the Project is set back approximately 100-feet or more from the banks of the rivers, except for the inlet and outlet channel locations.

The following impact statements address potential impacts to special-status invertebrates, reptiles, birds, and mammals as well as all nesting birds (raptor and non-raptor species).

Special-Status Nesting Birds

The BSA may support nesting by various species of birds. Though most nesting birds within the BSA are expected to utilize the mixed oak-riparian woodland, nesting may occur in the elderberry savannah or annual grassland. Direct effects to nesting birds could occur as a result of construction activities that remove active nests. Indirect effects to nesting birds could occur as a result of construction activities that cause either abandonment or inattention at the nest for long periods of time. The latter allows for predation or other sources of mortality (e.g., loss of eggs or juveniles from extreme cold or heat) that can contribute to nest failure. Non-raptor special-status birds considered to have some potential, albeit low,

to occur within the BSA include loggerhead shrike, oak titmouse, and Lawrence's goldfinch. The Project could result in direct or indirect impacts to one or more of these species.

By removing potential nesting habitat prior to the nesting season (non-nesting season), the potential impacts to nesting birds can be reduced to a Less than Significant Impact. The non-nesting season is considered to be August 15 to February 15 for all birds potentially affected by the Project. Removal of the vegetation (i.e., rough grading) earlier in the non-nesting season (i.e., prior to January 1) could potentially allow the vegetation to recover by the time birds in the area initiate nesting activities. Thus, it is best to remove potential nesting habitat later in the non-nesting season (January 1 to February 15) to discourage birds from nesting on the site during the early part of the nesting season.

If construction is initiated during the nesting season (February 15 through August 15), the Owner's shall conduct a pre-construction nesting bird survey by a qualified wildlife biologist (approved by CDFW and TID) prior to any site preparation activities in association with any phase.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure BIO-1: *The following avoidance and minimization efforts shall be used as methods to avoid accidental take of all native nesting birds as a result of the Project. During all Project activities, the Owners shall use the following mitigation measures to minimize impacts to all native nesting birds:*

1. *The Owners shall rough grade all annual grassland and elderberry savannah within the construction footprint of the Project during the end of the non-nesting season (January 1 through February 15) of the year in which construction starts to ensure that there is no available nesting habitat for birds in these onsite habitats.*
2. *If construction is initiated during the nesting season (February 15 through August 15), the Owner's shall conduct a pre-construction nesting bird survey by a qualified wildlife biologist (approved by CDFW and TID) prior to any site preparation activities in association with any phase.*

   The surveys shall be conducted 30 days prior any site preparation activities (vegetation clearing) and again no later than three days prior to any site preparation activities (vegetation clearing). The survey shall be conducted within all onsite habitats that could support nests and are within 120 feet or less of proposed construction activities. All active nests that are found during the survey will be geo-referenced with a global positioning system (GPS) unit and mapped on an appropriate scale map of the Project site (no smaller than 1 inch = 40 feet). Data will be collected for each active nest site and at a minimum will include: (1) identification of nesting species; (2) description of nest site; (3) estimated nesting

cycle status (i.e., time to nest completion, egg-laying, fledging, etc.); and (4) likelihood of nest failure from adjacent project-related activities.

Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any special-status species are present onsite, the Owners shall develop and implement a plan for the protection of these species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to CNDDB within ten (10) days of sighting.

3. *All active nests found during the preconstruction survey will be monitored at least twice per week to assess whether adjacent project-related activities are adversely affecting the nest. If adverse effects are observed, all Project-related activities within 120 feet of the nest will be temporarily halted until fledging occurs (i.e., the juveniles are no longer dependent upon the nest).*
4. *No preconstruction nesting bird survey is required in areas within 120 feet of construction activities, if construction is initiated in the non-nesting season (August 15 to February 15).*

Level of Significance after Mitigation

Less than significant.

Special-Status Nesting Birds

The BSA may support nesting by various species of birds (including raptors). Raptors (birds in the orders Falconiformes, diurnal birds of prey, or Strigiformes, nocturnal birds of prey) are addressed separately from other nesting birds, given that they are subject to more rigorous regulatory protection, and the potential indirect effects to these species may occur over longer distances than occurs with other birds. As with other nesting birds, indirect effects to nesting raptors could occur as a result of construction activities that cause either abandonment or inattention at the nest for long periods of time. The latter allows for predation or other sources of mortality (e.g., loss of eggs or juveniles from extreme cold or heat) that result in nest failure. Direct effects to nesting raptors could occur as a result of construction activities that remove active nests. Special-status raptors considered to have some potential, albeit low, to occur within the BSA include Cooper's hawk, white-tailed kite, and burrowing owl. The Project could result in direct or indirect impacts to one or more of these species as well as species such as red-tailed hawk and red-shouldered hawk (species only afforded protection under pertinent sections of the California Fish and Game Code).

Level of Significance before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure BIO-2: *The following measures shall be used to avoid or minimize indirect effects to nesting raptors as a result of the Project:*

1. *If construction is initiated during the nesting season (between February 15 and August 15), the Owners shall conduct a pre-construction nesting raptor survey by a qualified wildlife biologist (approved by CDFW and TID) prior to any site preparation activities in association with any phase.*

   The surveys shall be conducted 30 days prior any site preparation activities (vegetation clearing) and again no later than three days prior to any site preparation activities (vegetation clearing). The survey shall be conducted within all onsite areas that could support nests and are within 300-feet or less of proposed construction activities. All active nests that are found during the survey will be geo-referenced with a global positioning system (GPS) unit and mapped on an appropriate scale map of the Project site (no smaller than 1 inch = 100 feet). Data will be collected for each active nest site and at a minimum will include: (1) identification of nesting species; (2) description of nest site; (3) estimated nesting cycle status (i.e., time to nest completion, egg-laying, fledging, etc.); and (4) likelihood of nest failure from adjacent project-related activities.

   Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any sensitive species are present onsite, the Owners shall develop and implement a plan for the protection of these species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to the CNDDB within ten (10) days of sighting.

2. *All active raptor nests found during the preconstruction survey will be monitored at least twice per week to assess whether adjacent project-related activities are adversely affecting the nest. If adverse effects are observed, all Project-related activities within 300-feet of the nest will be temporarily halted until fledging occurs (i.e., the juveniles are no longer dependent upon the nest).*

3. *No preconstruction nesting raptor survey is required in areas within 300-feet of construction activities, if construction is initiated in the non-nesting season (August 15 to February 15).*

Level of Significance after Mitigation

Less than significant.

Western Pond Turtle or Northern California Legless Lizard

The reaches of the Lower Kaweah River and St. Johns River that are adjacent to the BSA may provide habitat for western pond turtle. No occurrences of this species have been documented near the BSA nor was it observed during the surveys conducted by Bumgardner Biological Consulting. However, the species

has been documented both upstream and downstream in the watersheds of these two rivers. As such, its presence within the BSA cannot be discounted, though it is projected to have a low likelihood of occurrence at or adjacent to the Project site. Individuals could then be injured or killed during construction activities in and on the banks of the rivers. Furthermore, the BSA provides potential nesting habitat and nests (i.e., eggs) could be unearthed and destroyed during construction activities (particularly grading and earth-moving). Therefore, the Project could result in direct or indirect effects to western pond turtles.

The sandy loam soils within the BSA may provide habitat for Northern California legless lizard. No occurrences of this fossorial (i.e., subterranean) species have been documented near the BSA nor was it observed during the surveys conducted by Bumgardner Biological Consulting. However, the species has been documented downstream in the Kaweah River corridor. As such, its presence within the BSA cannot be discounted, though it is projected to have a low likelihood of occurrence at or adjacent to the Project site. Nonetheless, individuals could be injured or killed during construction activities in suitable habitat.

Level of Significance before Mitigation

Potentially significant

Mitigation Measures

Mitigation Measure BIO-3: *The following measures shall be used to avoid or minimize direct effects to western pond turtle as a result of the Project:*

1. *The Owners shall conduct a preconstruction survey for western pond turtle by a qualified wildlife biologist (approved by CDFW and TID) along the adjacent reaches of the Lower Kaweah River and St. Johns River. The survey shall be conducted by a qualified biologist within three days of the initiation of construction on those portions of the Project that occur in the rivers, or on their adjacent banks (if there is flowing or standing water in these reaches). If turtles are observed during the preconstruction survey, and a qualified biologist determines construction activities could harm the turtles, the qualified biologist shall conduct the salvage and relocation of turtles downstream to the nearest appropriate aquatic habitat during the same day of their capture. The aquatic habitat to which the turtles are being relocated shall be less than one (1) mile downstream of the Project.*
2. *All construction staff shall be aware of the potential to uncover western pond turtle nests or during grading and earthmoving activities involving the top 12 inches of soil. Construction staff shall be advised, if turtle eggs are discovered during such activities, construction shall be temporarily halted until a qualified biologist can evaluate the site and egg scatter. Construction staff shall be responsible for covering the eggs with a small layer of sand or soil (to prevent damage or overheating) prior to the arrival of the qualified biologist. The qualified biologist will then salvage the eggs and transport them to a nearby wildlife rehabilitation center that has been approved in advance by the CDFW. Release of any*

hatchling turtles from the wildlife rehabilitation center shall occur in either the Kaweah or St. Johns rivers in appropriate aquatic habitat.

3. *All construction staff shall be aware of the potential to uncover Northern California legless lizards during grading and earthmoving activities involving the top 12 inches of soil. Therefore, monitoring for Northern California legless lizards shall be conducted concurrently with monitoring for western pond turtle nests. Construction staff shall be advised, if Northern California legless lizards are discovered during such activities, construction shall be temporarily halted until the individual can be captured by hand and placed in a lidded two-gallon bucket containing no less than three inches of moist soil from the location of capture. Construction staff shall be responsible for placing the bucket in a continuously cool, shaded, and protected location until the arrival of a qualified biologist. The qualified biologist will then relocate the individual(s) to an adjacent location at least 100 feet beyond the boundaries of the Project that has been approved in advance by the CDFW.*

Level of Significance after Mitigation

Less than significant.

Special-Status Invertebrate Species

The Project site has some potential, albeit low, to support Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, and Tulare cuckoo wasp. The ecology of each of these species is poorly known, but they have all been recorded in the general vicinity of the Project site. Consequently, construction activities associated with the Project could result in the loss of populations of one or more of these species. The Project could result in direct or indirect effects to special-status invertebrate species.

Valley elderberry longhorn beetle (VELB) was previously considered to be a special-status invertebrate species that could be affected by the Project. However, the USFWS published a Final Rule in the September 17, 2014 Federal Register indicating that all previous occurrences in Tulare County that had been attributed to VELB are the non-listed "sister" subspecies *Desmocerus californicus californicus*. Hence, no impacts to VELB would occur as a result of the Project.

Level of Significance before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure BIO-4: *The following measures shall be used to compensate for direct and indirect effects to Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp as a result of the Project:*

1. *The Owners shall conduct preconstruction surveys for Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, and Tulare cuckoo wasp during the known active season of each of these species prior to the commencement of construction activities. The survey shall*

be conducted by a qualified biologist within all onsite habitats that could support these species.

2. *If individuals of Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp are found during the preconstruction survey, pertinent data regarding the associated habitat (e.g., vegetation communities, soils, associated invertebrate species, etc.) shall be collected to better understand the ecology of the species.*
3. *All pertinent data collected during the preconstruction survey shall be included in the information submitted to the CNDDB along with the new occurrence record. Results of surveys, including negative findings, shall be submitted to CDFW within three days of their conclusion. If any of these special-status invertebrates are found to be present onsite, the Owners shall develop and implement a plan for the protection of the species, to be approved by CDFW in a timely manner. The results of any protective measures instituted as a part of the protection and monitoring plan shall be provided to CDFW in electronic format within one week of implementation. The Owners shall be responsible for reporting all observations of special-status species to the CNDDB within ten (10) days of sighting.*
4. *If individuals of Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, or Tulare cuckoo wasp are found during the preconstruction survey, an impact avoidance and minimization plan shall be developed and implemented for the species onsite. The plan will focus on temporary or permanent avoidance of occupied habitat where feasible using exclusionary fencing (temporary or permanent). Where avoidance is not feasible impacts shall be minimized through onsite biological monitoring. The onsite biological monitor shall have authority to temporarily halt any work that would directly impact occupied habitat and determine if a smaller impact footprint is feasible. Work shall then resume after concurrence on the necessary impact footprint.*

Level of Significance after Mitigation

Less than significant.

San Joaquin Kit Fox

The BSA has some potential, albeit low given the distribution of known occurrences in the project vicinity, to support San Joaquin kit fox. However, this potential is limited to lands adjacent to the existing access road in the northwestern portion of the Seaborn site where there is documented California ground squirrel activity and burrows. There is no California ground squirrel activity associated with the Project site given that the onsite sandy soils are unsuitable for burrow construction. It should be noted that the environmental baseline for San Joaquin kit fox on the Seaborn site would only change regarding on-road haul truck trips. Therefore, potential impacts to San Joaquin kit fox are considered limited to the increase in number of on-road haul truck trip and San Joaquin kit foxes being hit by on-road haul trucks utilizing the access road. The Project could then result in direct effects to San Joaquin kit fox. However, it should be noted that the Project would not result in an increase from the baseline number of on-road haul trucks.

Regardless, Mitigation Measure BIO-5 would provide additional protection measures to the San Joaquin kit fox.

Level of Significance before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure BIO-5: *The following measures shall be used to avoid or minimize direct effects to San Joaquin kit fox as a result of the Project:*

1. *On-road haul truck trips to and from the Project site shall be limited to the period 0.5 hours prior to sunrise to 0.5 hours after sunset.*
2. *On-road haul trucks and other vehicles utilizing the existing access road on the Seaborn site shall be limited to a maximum speed of 10 miles per hour.*
3. *The entry into the Seaborn site on the existing access road shall be signed as follows "Watch for Wildlife Crossing the Road." The sign shall be a minimum of 4-feet by 4-feet in size with minimum 12-inch block letters.*

Level of Significance after Mitigation

Less than significant.

Fencing Effects on Wildlife

At the request of CDFW, potential impacts due to the use of Project fencing were evaluated and it was determined that fencing materials could be harmful to wildlife, or result in wildlife becoming trapped, resulting in injury or mortality. For example, birds and reptiles sometimes seek out hollow metal fence posts in which to reside and then become trapped, resulting in mortality. In addition, raptor's talons can become entrapped within the bolt holes of metal fence stakes resulting in injury or mortality. Lastly, erosion protection such as wattles encased in plastic/nylon netting can result in entrapment of snakes and lizards. Ultimately resulting in injury or mortality of individuals.

Level of Significance before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure BIO-6: *To avoid wildlife injury or mortality related to fencing materials, all hollow fence posts shall be capped and all empty bolt holes in metal fence posts shall be plugged. The use of sharp fencing materials is prohibited, including, but not limited to, spikes, glass, razor, or barbed wire. The use of erosion-protection materials using plastic/nylon netting is prohibited.*

Level of Significance after Mitigation

Less than significant.

3.4.6.2 Adverse Effects on Riparian and Other Critical / Special-Status Habitats

Impact Statement

Impact BIO-2: *Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?* **(CEQA Guidelines Threshold Criteria (b))**

Impact Analysis

The BSA supports, mixed oak-riparian woodland and elderberry savannah, both considered sensitive vegetation communities. Tulare County has determined that such vegetation communities are an important resource that should be protected and/or conserved, where feasible. Applicable General Plan policies (see Section 3.4.3.3) that address oak and riparian resources include the following:

- **Policy ERM-1.4 – Protect Riparian Areas:** The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.
- **Policy ERM-1.5 – Riparian Management Plans and Mining Reclamation Plans:** The County shall require that mining reclamation plans, and other management plans include measures to protect, maintain and restore riparian resources and habitats.
- **Policy ERM-1.6 – Management of Wetlands:** The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.
- **Policy ERM-1.12 – Management of Oak Woodland Communities:** The County shall support the conservation and management of oak woodland communities and their habitats.

The Project is designed to minimize the removal of the oak-riparian woodland, as can be seen by comparing the area of proposed excavation shown with the mixed oak-riparian woodland shown on Figure 3.4-1. Except for the limited area associated with the inlet channel, the Project boundaries would be significantly pulled back to provide protection to the oak-riparian habitat. The Project boundaries would also be pulled back by approximately 100-feet along the rest of the riverbank to protect the riparian vegetation (except for the limited area of the outlet channel). In addition, the inflow and outflow channels would remove some riparian vegetation; however, as discussed in Impact Statement BIO-3 below because the rivers are considered jurisdictional waters, disturbance of these areas would require consultation and approval from the ACOE and CDFW; therefore, providing further protection to these habitats.

As previously discussed, the elderberry savannah is not potential habitat for the VELB. Therefore, the Project would not have a substantial adverse effect on any riparian or other sensitive natural community identified in local or regional plans, policies, or regulations by CDFW or USFWS.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

> ***Mitigation Measure BIO-7:*** *The Owners shall prepare and implement an Oak-Riparian Habitat Management Plan that identifies the management areas and requires any excavation to remain outside of those identified areas. It will also require that the construction of the reservoir inlet and outlet channels be located and built in such a manner to minimize loss of habitat.*

Level of Significance after Mitigation

Less than significant.

3.4.6.3 Adverse Effects on Wetlands

Impact Statement

Impact BIO-3*: Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filing, hydrological interruption, or any other means?* **(CEQA Guidelines Threshold Criteria (c))**

Impact Analysis

A reconnaissance-level search for waters with regulatory jurisdiction under the CWA, California Fish, and Game Code and/or Porter Cologne Act within the Project site boundaries was conducted by BBC during the biological site surveys. As discussed in Section 3.4.2.3, BBC notes the Project site includes waters that are subject to state and federal jurisdiction. These waters, Lower Kaweah River and St. Johns River, would receive fill associated with the construction of the Inflow and Outflow Channels of the Project. As such, both the riverbed/riverbank, as well as any riparian vegetation within the immediate construction area would be affected by the Project. The Project would remove riparian vegetation and could result in fill of jurisdictional waters.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

None required.

Mitigation Measure BIO-8*: The following measures shall be used to avoid, minimize, or compensate for fill of jurisdictional waters and the removal of riparian vegetation as a result of the Project:*

1. *The Owners shall consult with the RWQCB and if determined necessary, submit Section 401/404 permit applications for fill of jurisdictional waters of the United States that includes a Wetland Protection and Compensation Plan. At a minimum, the wetland protection and compensation plan shall require 3:1 compensation for permanent effects to jurisdictional waters of the United States and 1:1 compensation for temporary effects to jurisdictional waters of the United States.*
2. *The Owners shall submit an application for fill of waters subject to the jurisdiction of the CDFW (i.e., long-term lake and streambed alteration agreement). The application shall include a Wetland Protection and Compensation Plan that, at a minimum, requires 3:1 compensation for permanent effects and 1:1 compensation for temporary effects to waters under the jurisdiction of the State.*

Level of Significance after Mitigation

Less than significant.

3.4.6.4 Conflict with Movement of Migratory Fish or Wildlife Species

Impact Statement

Impact BIO-4*: Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?* (**CEQA Guidelines Threshold Criteria (d))**

Impact Analysis

As previously noted, much of the river corridor that is within the BSA has little vegetative cover, which likely limits the movement of some species through the area. However, given the adjacent open space, passage by other species still occurs along the river under cover of darkness, despite the lack of vegetation. In addition, there are no established native resident or migratory wildlife corridors within or adjacent to the BSA, nor are there known native wildlife nursery sites within the BSA.

Because the Project is set back from the adjacent rivers (as illustrated in Figures 2-4 and 2-5 in Section 2.0 – Project Description), it does not provide a substantive barrier to wildlife movement along the river corridor. Because the bottom of the inlet and outlet channels are below the grade of the bottom of the river channel, there would be water in the inlet and outlet channels when there is water in the rivers. However, there are alternative ways to move east and west through the area such as the perimeter road that goes over the inlet and outlet structures and also by going around the BSA and CEMEX Lemon Cove Facility to the north.

Therefore, the Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.4.6.5 Interference with Biological Resource Policies or Ordinances

Impact Statement

Impact BIO-5: *Would the Project conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance?* (**CEQA Guidelines Threshold Criteria (e))**

Impact Analysis

Applicable General Plan policies that address biological resources are discussed in Section 3.4.3.3 above, and a consistency analysis is provided in Table 3.8-2 in Section 3.8 – Land Use. The following are the primary policies that affect the Project in regard to biological resources:

- **Policy ERM-1.4 – Protect Riparian Areas:** The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.
- **Policy ERM-1.5 – Riparian Management Plans and Mining Reclamation Plans:** The County shall require that mining reclamation plans, and other management plans include measures to protect, maintain and restore riparian resources and habitats.
- **Policy ERM-1.6 – Management of Wetlands:** The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.
- **Policy ERM-1.12 – Management of Oak Woodland Communities:** The County shall support the conservation and management of oak woodland communities and their habitats.

As discussed above in Section 3.4.6.2 and addressed in Table 3.8-2, the Project would not conflict with any local policies or ordinances protecting biological resources.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.4.6.6 Conflict with Habitat Conservation Plans

Impact Statement

Impact BIO-6: *Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?* **(CEQA Guidelines Threshold Criteria (f))**

Impact Analysis

There are no approved habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans that include the BSA. As such, the Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.4.7 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 identifies the other projects in the County to be considered in regards to potential cumulative impacts. Figure 3.0-1 provides the location of the cumulative projects in relation to the Project site. As discussed in the impact analysis above, the Project was determined to have a less than significant impact or less than significant impact after mitigation. Since the Project would present less than significant impacts related to biological resources, there would be no cumulative impact in conjunction with the other cumulative projects.

A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) Planning Branch. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects and are listed in Table 3.0-1 and their location provided in illustrated Figure 3.0-1, both of which appear in Section 3.0 – Environmental Impact Analysis.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to biological resources.

The majority of the cumulative projects provided by the County are located some distance from the Project and involve activities that are not similar to the Project, such as minor divisions of land, rezoning, or amendments to the General Plan. Therefore, these projects are not considered to have a potential cumulative impact on biological resources.

Cumulative projects numbers 18 through 22 are existing and/or approved mining projects in the immediate vicinity of the Project. These projects have completed their entitlement phase and as part of the evaluation process the applicants were required to analyze their project's impacts and conduct field surveys to evaluate potential impacts to biological resources. Potential impacts were found to be less than significant. In addition, projects 18 through 20 are existing and their operations have been included in the baseline for this Project.

As discussed in this section, the Project impacts are either less than significant or significant, but mitigated to less than significant. Therefore, the Project's contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts to biological resources.

3.5 CULTURAL RESOURCES

3.5.1 Introduction

This section of the DEIR describes the cultural and historical resources identified within the cultural study area, evaluates the potential effects that the Project may have on these resources, and identifies mitigation measures to address potentially significant impacts. The primary source used in this evaluation was the Cultural Resource Investigation (Applied EarthWorks, Inc., 2013, Updated 2021) for the McKay Point Reservoir Project prepared by Applied EarthWorks, Inc. (*Æ*). Copies of the 2013 Cultural Resource Investigation and the 2021 Addendum are provided in Appendix E.

3.5.2 Environmental Setting

The following descriptions refer to cultural and historical resources that may be found in the region, vicinity and on the Project site. Cultural resources consist of remains and sites associated with past human activities. These include prehistoric Native American archaeological sites, historic archaeological sites, and historic sites, buildings, structures or objects. They also include traditional cultural properties or areas such as Native American sacred sites that have been, and often continue to be, of special economic and/or religious significance.

Historical resources are generally those associated with periods of recorded history, often in connection with European settlement of North America. Some historical resource sites can also be of cultural significance to contemporary Native Americans or other ethnic groups because they contain objects or elements important to their cultural heritage. Significant historical resources and traditional cultural properties are afforded a measure of protection under existing Federal, State and local laws.

The Cultural Resource Investigation characterizes the Project setting in terms of the natural environment, local prehistory, ethnography and history.

3.5.2.1 Regional Setting

The Project is located in the San Joaquin Valley, the southern half of an elongated trough called the Central Valley. The Central Valley is a 50-mile-wide lowland that extends approximately 500 miles from the Cascade Range to the Tehachapi Mountains (Applied EarthWorks, Inc., 2013, Updated 2021). The Central Valley is divided into two (2) unequally sized lobes separated by the Stockton fault. The northern lobe is the Sacramento Valley, drained by the Sacramento River, whereas the southern lobe is the San Joaquin Valley, drained by the San Joaquin River. The southeastern end of the San Joaquin Valley contains the now dry Tulare–Buena Vista–Kern Lake basin.

The San Joaquin Valley is bound by the Sacramento/San Joaquin River Delta to the north, the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The San Joaquin Valley comprises two (2) distinct hydrologic subbasins: the San Joaquin and the Tulare. The San Joaquin subbasin is drained by the San Joaquin River. The Tulare subbasin has no regular surface outlet; it was formed by the merging of alluvial fans from the Kings River to the east and Los Gatos Creek to the

west (Applied EarthWorks, Inc., 2013, Updated 2021). The Tulare subbasin rivers—the Kings, Kaweah, Tule, and Kern—flowed into the subbasin, forming large inland lakes. Tulare Lake, approximately 30 miles southeast of the Project area, was an extremely shallow seasonal lake that expanded horizontally across the flat landscape as it filled with winter and spring runoff. It's broad yet shallow dimensions resulted in wide fluctuations of the lake's shoreline during both prehistoric and historical times. As it filled beyond its natural alluvial barriers, water was channeled down the Fresno Slough into the San Joaquin River. Tulare Lake was the largest naturally occurring lake in California as recently as 1920 (Applied EarthWorks, Inc., 2013, Updated 2021). The size of the lake was gradually reduced by the historical development of irrigation systems and the reclamation of water from the Kings River and other sources. Today, Tulare Lake only exists in times of flooding, and the deep reserve of groundwater is tapped for private and public use.

The Project area is located on the north side of the confluence of the St. Johns River and the Lower Kaweah River, near Woodlake in Tulare County. The Kaweah River flows from a canyon in the Sierra Nevada approximately 3 miles to the northeast. The Kaweah is one of a number of rivers (including the Kern, Tule, and Kings) that deposit low-gradient fans along the eastern San Joaquin Valley and drain the western slopes of the Sierra Nevada range. The development of agriculture within the Project area resulted in the replacement of native plants and animals with domesticated species. Elevations in the Project area range between 450- and 470-feet above mean sea level (amsl).

Several branch streams (including the St. Johns River) diverge from the Kaweah River soon after it exits the canyon at the head of a large low-gradient alluvial fan commonly referred to as the Kaweah Delta. The river is now dammed, and water flow is highly regulated; however, many of the formerly natural channels are still evident. Additionally, sloughs, abandoned channels, and overflow channels further connect or distribute water across the lower portion of the alluvial fan. Between channels are large masses of recently vegetated alluvium, rapidly aggrading due to the cohesive nature of fine particles and root binding by vegetation (Applied EarthWorks, Inc., 2013, Updated 2021). This hydrological system has been highly modified by channelization and water control in the valley, and some drainages (including the St. Johns River) flow only seasonally, if at all.

Regionally, natural conditions and resources have greatly influenced human occupation and resource utilization. The presence of archaeological and historic resources would generally be most likely along rivers and streams and in other areas with ground cover or other features which could have invited and sustained habitation. Extensive accounts of California and local prehistory, ethnography, and history are provided below and in the Cultural Resource Investigation (Applied EarthWorks, Inc., 2013, Updated 2021) in Appendix E1.

Prehistoric Context

Relatively few research-oriented archaeological investigations have been conducted in the Central Valley south of the Stockton area, and synthesized information on prehistoric events in the area is sparse. Nonetheless, archaeological work performed within the Kaweah River drainage, and specifically a few

miles to the east at Lake Kaweah provides valuable information germane to regional prehistory. Further information comes from excavations performed in the mountains and hills to the south and southeast (Applied EarthWorks, Inc., 2013, Updated 2021).

The first large-scale excavations in the southern San Joaquin Valley were conducted near Tulare and Kern Lakes by Gifford and Schenck, who unearthed flexed burials, pottery, obsidian arrow points, milling stones and mortars, and intricately fashioned steatite artifacts. In the late 1940s, Riddell (Applied EarthWorks, Inc., 2013, Updated 2021) investigated a Yokuts cemetery near the town of Delano. The graves contained Euro-American items along with shell ornamentation, flaked stone tools, and steatite artifacts. Less than 10 years later, a team of archaeologists from University of California, Los Angeles, excavated another burial site at the edge of former Tulare Lake approximately 29 miles west of the Project.

Later archaeological investigations at Kern and Tulare lakes revealed that occupation occurred possibly as early as 11,000 years before present (B.P.). The Witt Site on the southwest shore of Tulare Lake contains fluted projectile points as well as later types, suggesting continuous occupation of the basin from Paleoindian times until historical contact (Applied EarthWorks, Inc., 2013, Updated 2021).

Excavation of a prehistoric site at Buena Vista Lake, found a deeply-buried component ascribed to the Western Pluvial Lakes Tradition that dated from circa 11,500–7500 B.P. Population density was low at that time, with a few settlements focused around the shores of ancient lakes. Between 8000 and 4000 B.P., the prehistoric economy centered on hunting and fishing, although mortars and pestles as well as Olivella and Haliotis shell beads and ornaments appear in some assemblages. Although populations may have centered on the lakes, there is some evidence for use of the mountains of eastern Tulare County as early as 6000 B.P. by small, highly mobile parties who repeatedly visited specific resource procurement areas (Applied EarthWorks, Inc., 2013, Updated 2021).

Beginning about 4000 B.P., the subsistence base expanded to include seed processing. Sites dating to this period contain assemblages comparable to the roughly coeval Early Horizon components of the Sacramento–San Joaquin Delta region (e.g., extended burials with grave goods, Pinto series projectile points, time-diagnostic Haliotis and Olivella beads as well as ornaments and charmstones). It is difficult to clearly determine the ancestry of these early peoples, although artifact assemblages associated with occupations postdating 3000 B.P. may be linked to the ancestors of the ethnographic Yokuts. The latest period of occupation, from 1500 B.P. to historic contact, indicates a greater reliance on acorns and other plant foods as well as trade with the Central Coast region and Southern California interior (Applied EarthWorks, Inc., 2013, Updated 2021).

Chronological data from research conducted within the Kaweah River drainage to the east of the Project area is limited as few radiocarbon dates, obsidian hydration measurements, or time-diagnostic artifacts have been collected or reported. Available data suggest that occupation of the Lake Kaweah area began around 2500 B.P., although it is likely that earlier occupations are simply unrecognized (Applied EarthWorks, Inc., 2013, Updated 2021).

The Kaweah River drainage generally, and the location currently covered by Lake Kaweah specifically, was well-populated in late prehistory. Some ethnohistoric period estimates place the population as high as 2,400 individuals. The area supported a large variety of site types, including villages, cemeteries, bedrock milling stations, hunting blinds and traps, and rock art. The settlement system appears to have centered on villages, occupied most or all of the year, from which small groups (likely families) would radiate out to gather resources at seasonal camps and special-use sites (e.g., hunting locations, acorn gathering spots, etc.) (Applied EarthWorks, Inc., 2013, Updated 2021).

The identity of the prehistoric occupants of the Lake Kaweah area is open to some interpretation. Several sites indicate cemetery burials in keeping with late prehistoric and ethnohistoric Yokuts traditions. However, other sites contain cremations and burials in house floors. This may indicate retention of earlier burial practices within the Lake Kaweah area, or it may indicate that the area was occupied by both Yokuts and Mono peoples. This latter hypothesis is further supported by local rock art, which appears to be more similar to known Mono styles than to that of the Yokuts. Moreover, pottery, an innovation often attributed to the Mono, is relatively abundant in Lake Kaweah sites, while steatite vessels more common in the western Yokuts sites are rare (Applied EarthWorks, Inc., 2013, Updated 2021). While, the ethnographic record indicates that the region was populated by Yokuts people, the aggregate data seem to suggest that either the Yokuts population regularly interacted with and shared many traits of the neighboring Mono population, or that the area prehistorically was used by both groups.

Ethnographic Context

The Project area is within the homeland of the Gáwea (or Kaweah) Yokuts, one of the many autonomous tribes that make up the Southern Valley Yokuts ethnolinguistic group. At the time of first contact with the Spanish missionaries, the Yokuts people, including northern valley and foothill groups, collectively inhabited the San Joaquin Valley as well as the eastern foothills of the Sierra Nevada from the Calaveras River southward to the Kern River (Applied EarthWorks, Inc., 2013, Updated 2021).

The basic unit of Yokuts society was the nuclear family, which was identified with a totem symbol specific to the paternal line. Within each tribe, lineage totems were further grouped into one of two moieties, designated by the overarching symbols of the eagle and coyote. The basic political unit was the tribe or tribelet, which encompassed a single village or several settlements (Applied EarthWorks, Inc., 2013, Updated 2021).

Tulare Lake and its tributary rivers, including the Kaweah and the St. Johns, were a central part of Southern Valley Yokuts subsistence, providing food, building material, and avenues of travel for small watercraft. Not surprisingly, most Yokuts villages were situated near major waterways or around Tulare Lake. For example, the main Gáwea village, also known as *Gáwea*, was situated on the north side of the Kaweah River at the current location of Terminus Dam. The rivers provided fish, waterfowl, and other game attracted to the fresh water. The tule stalk was used in the manufacture of mats, baskets, and other goods (Applied EarthWorks, Inc., 2013, Updated 2021).

Most flaked stone artifacts were fashioned from obsidian and other imported material. Ground stone artifacts, inclusive of handstones and milling slabs/slicks as well as mortars and pestles, were manufactured of granitic and metavolcanics rock. Where suitable outcrops were available, milling slicks and bedrock mortars were manufactured on bedrock. Where bedrock was not available, portable mortars and slabs manufactured from large cobbles and small boulders were used.

At the broader interregional level, the villages of the Southern Valley Yokuts profited from the east-west trade of goods that flowed between the Pacific coast and the high Sierra and Great Basin. The Yokuts bartered their local staples (e.g., freshwater fish, acorns, and tule reeds) to obtain such goods as Olivella beads and other shell material from the west as well as obsidian from the east.

As with other Indian groups in California, the lifeways of the Yokuts were dramatically altered as a result of contact with Spanish explorers and missionaries, miners, ranchers, and other immigrants who entered the San Joaquin Valley after 1700. In 1856, the Tule River Indian Reservation was established for the Koyeti and Yaudanchi tribes. The reservation was moved from its original site just east of Porterville, designated as State Historical Landmark #388, to its present location in 1873. As late as 1926, adobe ruins from the original reservation were still present. The introduction of European culture and new diseases proved devastating to the native population. In the 1860s, smallpox decimated Indians living at the Cobble Lodge site near Lake Kaweah (Applied EarthWorks, Inc., 2013, Updated 2021).

There are several Native American tribal groups with ancestral ties to the Project area, including the Santa Rosa Rancheria Tachi Yokut Tribe, Tule River Indian Tribe, and the Wuksache Indian Tribe/Eshom Valley Band. Several Southern Valley Yokuts tribes have survived the effects of colonization. Yokuts today have developed language apprenticeship programs and early childhood education centers to serve tribal members, including the Wukchumne of the Tule-Kaweah near Porterville, Choynimni speakers of the Kings River tribes, Chukchansi at the Picayune and Table Mountain rancherias near Fresno, and Yawelmani speakers of the Tule River Reservation. Several Yokuts tribal groups are governed by elders' councils and operate auxiliary departments that serve local tribal populations in areas of healthcare, education, and cultural resource management.

History

Government expeditions to the Tulare Lake basin during the mid to late 1840s resulted in recommendations for the development of agricultural settlements that would permanently alter the area. After discovery of gold at Coloma in 1848, speculators began entering the San Joaquin Valley. The miners' needs for food and supplies subsequently facilitated the development of ranching in the Tulare Lake basin. New roads and trails emerged throughout the area, and the ranching industry boomed when access to livestock markets to the north and south became available.

In 1853, Tulare County, which at the time included most of present-day Kings County, was established with the budding town of Visalia as the county seat. By the 1870s many Southern Pacific Railroad towns

had emerged, including Hanford (1877), Lemoore (1877), and Tulare (1872) (Applied EarthWorks, Inc., 2013, Updated 2021).

The pace of economic development in Tulare County greatly accelerated with the construction of irrigation systems. Several irrigation companies formed in the early and mid-1870s, and after overcoming initial financial and physical difficulties, the Lower Kings River, People's, and Last Chance ditches, among others, were delivering water to farms by the end of the decade. Tulare irrigation concerns tapped the ample Kings River, although some canals draw water from the Kaweah River and its branches.

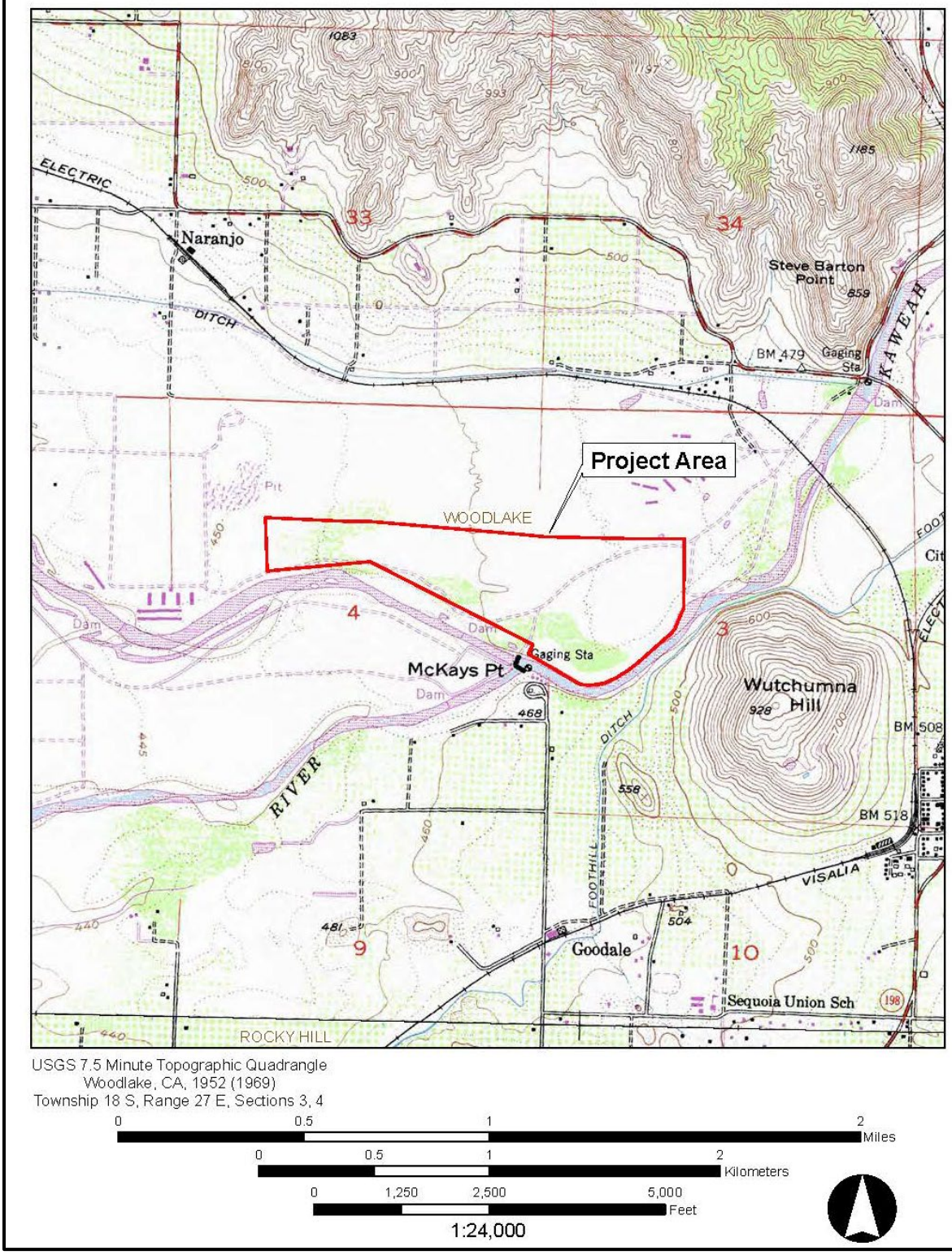
Citrus fruit, now a major crop in Tulare County, was initially thought "too exotic" for the San Joaquin Valley. Lemons, specifically, were thought to be ill-suited to the valley climate, until they were planted by James William Center Pogue in 1868. Initially planting nearer the Kaweah River, the Pogue family moved their orchards to the community of Lime Kiln. In addition to serving as the home base for Pogue's growing citrus operation, Lime Kiln also became the base for a large operation organized by Pogue, J. B. Wallace, and C. W. Crocker. The three also built the Pogue Hotel to serve travelers. In 1894, Pogue subdivided the land in and around Lime Kiln and sold residential lots, renaming the town Lemon Cove (Kaweah Commonwealth n.d.).

By 1910 the development of new towns and settlements had slowed dramatically, and improvements were initiated to construct better roads. Agricultural concerns continued to prosper, resulting in the intensification of local farming until the 1930s, when individual farmers emerging from the Great Depression no longer found agriculture to be a lucrative endeavor. Since that time farmland has increasingly been developed for commercial interests.

Despite the general slowdown in the development of new towns, Woodlake was founded in 1912 by land developer Gilbert F. Stevenson as a planned community surrounded by citrus orchards. Initial growth was rapid, and by 1913 Woodlake contained two schools, retail stores, two churches, a bank, and a newspaper. Stevenson further ensured the growth of the community by paying half of the cost to install a bridge across the St. Johns River, donating right-of-way to the railroad companies to bring trains (including the Visalia Electric Railroad) to the town, and building levees around Wood Lake (now known as Bravo Lake) to ensure that it remained a permanent year-round water feature (Applied EarthWorks, Inc., 2013, Updated 2021).

3.5.2.2 Vicinity Setting

As described in Section 3.5.5, Æ conducted various records searches to determine the presence of prehistoric or historic resources, including Native American cultural resources, on and in the vicinity of the Project. Specifically, a cultural resources records search, additional research, intensive-level pedestrian field survey, and a Sacred Lands File Search with the Native American Heritage Commission were conducted. The results of these searches and field surveys are described in Sections 3.5.2.3 and 3.5.5.



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-1 Cultural Resources Survey Coverage

3.5.2.3 Project Site Setting

The existing Project site and surrounding survey area has historically been used for cattle grazing and is covered in seasonal grasses with a sparse scatter of live oaks, maples, and cottonwood trees. Cattle have eaten most of the grass cover, and soil is visible throughout the proposed reservoir locations. Vegetation is dense in the reserved habitat area in the southeastern portion of the Project area. Approximately 90 percent of the survey area exhibited 60 percent or better ground visibility.

Sediments within the survey area consist of poorly sorted coarse- to fine-grained sand and sandy loams, ranging from gray to light tan in color. Based on examination of rodent burrows and areas of disturbance, it appears that the soils are poorly developed, consistent with recent sediment deposition. During a visit to the Project area on October 7, 2013, TID Project Engineer Aaron Fukuda informed Æ's personnel that overflow water from the mines and reservoirs immediately north of the Project has washed over the Project area and into the river channels. It is possible that recent sediments overlie previously deposited cultural materials obscuring them from view.

During the intensive-level field survey, cultural resources were recorded on Department of Parks and Recreation (DPR) 523 forms (see the Cultural Resource Investigation in Appendix E1). Æ's survey for the Project resulted in the discovery of two (2) isolated artifacts, one (1) from the historic era (Figures 3.5-2 and 3.5-3) and one (1) that is prehistoric P-54-005096 (Figures 3.5-4 and 3.5-5). Tribal cultural resources are discussed in Section 3.10 – Tribal Cultural Resources. The following sections describe the resources observed and recorded during the pedestrian surveys. The field methodology is described in Section 3.5.5 and the results in Section 3.5.6. Both sites are excluded from mapping for confidentiality and resource protection purposes.

Prehistoric Resources

The prehistoric find, P-54-005096 is an isolated basalt flake that is 4.5 centimeters long by 1.3 centimeters wide by 0.8 centimeters thick. It appears to be a secondary core reduction flake with no cortex. Three (3) flake scars are present on its dorsal side.

Historic Resources

The historic era find, P-54-005095 is the collapsed remains of a wood object, likely a wagon. The majority of planks were too badly degraded to measure, but those that could be measured were 3.5 inches by 3.5 inches in cross section, and of unknown length due to decay and breakage (see Figure 3.5-2). The hardware that held the planks together includes square nuts, round-headed nails, and metal rods of undetermined length (all were partially buried) that terminate in threaded nuts (see Figure 3.5-3). The longer rods are consistent with cross rods of the sort that held the sides on wood wagons. None of the observed hardware is time diagnostic, but wood wagons would have been more common in the nineteenth and early twentieth centuries.

Resources Immediately Outside the Project Area

Outside but immediately adjacent to the Project's eastern boundary are pieces of old machinery and a flatbed truck. These comprise a distinct scatter of unknown age and purpose. The bed, fenders, and cab of the truck are present, all other parts are missing (see Figure 3.5-6). It appears to be a Ford flatbed truck, likely from the late 1930s to mid-1940s. It is not possible to determine when the truck was left at this location. The machinery appears to be parts of pulley and conveyor belt systems, consistent with equipment used in both mining and agriculture (see Figure 3.5-7 and Figure 3.5-8). The age of these objects is unknown, although their association with the truck and the accumulation of sediments on parts of the machinery suggest that the truck and machinery were all deposited at or around the same time.

The Project, as currently designed, will not impact these objects, but their presence provides some information regarding the types of activities performed in the general vicinity of the Project. As such, they are worth noting, but they have not been formally recorded as cultural resources because they fall outside the Project area.



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-2 Historic Era Find – Wood Planks and Hardware at AE-2193-2



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-3 Historic Era Finds – Close-Up of Long Metal Rods in AE-2193-2



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-4 Prehistoric Era Find – Ventral Side of AE-2193-3



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-5 Prehistoric Era Find – Ventral Side of AE-2193-3



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-6 Remains of Truck Near Project's Eastern Boundary (view to the east)



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-7 Machinery East of Project Area (view to the east)



Source: (Applied EarthWorks, Inc., 2013, Updated 2021)

Figure 3.5-8 Machinery East of Project Area (view to the north-northeast)

3.5.3 Regulatory Setting

3.5.3.1 Federal

The National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. § 470 et seq.), as amended, is the center piece for historic preservation. This NHPA established the National Register of Historic Places (NRHP) which serves as the nation's inventory of districts, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture. A historic property is a cultural resource that is eligible for listing in the NRHP. The NRHP significance criteria applied to evaluate the cultural resources are defined in 36 CFR Section 60.4 as follows:

> *The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and*
>
> *(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or*
> *(b) that are associated with the lives of persons significant in our past; or*
> *(c) that embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent*

a significant and distinguishable entity whose components may lack individual distinction; or

(d) that has yielded, or may be likely to yield, information important in prehistory or history.

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a *historic property*, as defined in 36 Code of Federal Regulations (CFR) Section 800.5. An impact is considered significant when prehistoric or historic archaeological sites, structures, or objects listed in or eligible for listing in the NRHP are subjected to the following adverse effects:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR Part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration; and
- Transfer, lease, or sale of the property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

3.5.3.2 State

California Public Resources Code Sections 5020-5029

The California Public Resources Code Sections 5020-5029 (inclusive) provide the regulatory framework for State agencies regarding the inventory, evaluation and protection of historical properties and resources of significance. The Code states:

> "*No state agency shall alter the original or significant historical features or fabric, or transfer, relocate, or demolish historical resources on the master list maintained pursuant to subdivision (d) of Section 5024 without, early in the planning process, first giving notice and a summary of the proposed action to the State Historic Preservation Officer (SHPO) who shall have 30 days after receipt of the notice and summary for review and comment."* (Public Resources Code § 5024.5a)

Resources listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) are resources that are required to be given consideration in the CEQA process. A resource listed in, or eligible for listing in the CRHR is presumed to be historically or culturally significant: this includes listed archaeological resources. The CRHR is an authoritative guide to the State's historical resources, and listed properties are considered significant for purposes of CEQA. The CRHR includes resources listed in or formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local

preservation ordinance (local landmarks or landmark districts), or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA, unless a preponderance of evidence indicates otherwise (Pub. Resources Code § 5024.1, 21084.1, 14 CCR § 15064.5).

However, a resource does not need to have been identified previously either through listing or survey, to be considered significant under CEQA. In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources (Pub. Resources § 21084.1, 14 CCR § 15064.5(3)). Generally, a resource will be considered by the lead agency to be "historically significant" if it meets the criteria for listing on the CRHR (Pub. Resources Code § 5024.1, Title 14 CCR 4852) including the following:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

Historic resources eligible for listing in the CRHR must meet one of the criteria of significance described above and, like the NRHP, must retain enough of their historic character to be recognizable and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility. Alterations over time to a resource or historic changes in its use may themselves have historical, cultural, or architectural significance. It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the NRHP, but they may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR, if it maintains the potential to yield significant scientific or historical information or specific data.

California Health and Safety Code Section 7050.5 (b) – Human Remains

In accordance with California Health and Safety Code Section 7050.5 (b), if human remains are discovered during ground disturbing activities, the County Coroner must be notified. Section 7050.5 (b) states that "*there shall be no further excavation or disturbance of the site or any nearby area reasonably expected to overlie adjacent remains*" until the coroner has made certain determinations as required by California Government Code, commencing with Section 27460. Health and Safety Code Section 7050.5 (c) states: "*If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC).*"

Upon notification by the coroner, the NAHC must comply with Public Resources Code § 5097.98:

(a) Whenever the commission receives notification of a discovery of Native American human remains from the county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code:

1. *It shall immediately notify those persons it believes to be most likely descended from the deceased Native American.*
2. *The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend… means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48-hours of being granted access to the site.*

(b) Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section, with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

Public Resource Code Sections 21074, 5024.1 – AB 52

On September 25, 2014 Governor Brown signed Assembly Bill No. 52 (AB 52), which created a new category of environmental resources, specifically Tribal Cultural Resources, which must be considered under CEQA. The law went into effect on July 1, 2015.

AB 52 created new requirements for consultation with tribal governments regarding projects that may affect tribal cultural resources. It includes a definition of tribal cultural resources, a tribal consultation process and identification of mitigation measures as agreed upon with tribal representatives. AB 52 and tribal cultural resources are discussed in detail in Section 3.18 – Tribal Cultural Resources.

3.5.3.3 Local

Tulare County General Plan (2012)

The Tulare County General Plan (Tulare County, 2012) includes goals and policies directed toward protecting cultural resources in the County. Policies found in the Scenic Landscapes (Chapter 7) and Environmental Resources Management (Chapter 8) elements seek to preserve the historical, archeological, and cultural resources of the County through development review, acquisition, and encouragement of easements, coordination with other agencies and groups, and other methods. Select goals and policies relevant to this analysis are listed below.

SECTION 7.2 – SCENIC CORRIDORS AND PLACES

Goal SL-2: To protect the scenic views for travelers along the County's roads and highways.

Policy SL-2.3 – Historic and Cultural Landscapes: The County shall use the County's scenic routes and highways to connect cultural landscapes, historic landmarks and communities, and points of interest including:

1. Historic travel routes and trails,
2. Historic settlements,
3. Historic places, events, sites, buildings and structures,
4. Prehistoric and archeological features, and
5. Majestic trees, streetscapes, and parks.

SECTION 8.6 – CULTURAL RESOURCES

Goal ERM-6: To manage and protect sites of cultural and archaeological importance for the benefit of present and future generations.

Policy ERM-6.1 – Evaluation of Cultural and Archaeological Resources: The County shall participate in and support efforts to identify its significant cultural and archaeological resources using appropriate state and federal standards.

Policy ERM-6.2 – Protection of Resources with Potential State or Federal Designations: The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of Statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.

Policy ERM-6.3 – Alteration of Sites with Identified Cultural Resources: When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site-specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and mitigation measures proposed for any impacts the development may have on the resource.

Policy ERM-6.4 – Mitigation: If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.

Policy ERM-6.5 – Cultural Resources Education Programs: The County should support local, state, and national education programs on cultural and archaeological resources.

Policy ERM-6.6 – Historic Structures and Sites: The County shall support public and private efforts to preserve, rehabilitate, and continue the use of historic structures, sites, and parks. Where applicable, preservation efforts shall conform to the current Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.

Policy ERM-6.7 – Cooperation of Property Owners: The County should encourage the cooperation of property owners to treat cultural resources as assets rather than liabilities, and encourage public support for the preservation of these resources.

Policy ERM-6.8 – Solicit Input from Local Native Americans: The County shall continue to solicit input from the local Native American communities in cases where development may result in disturbance to sites containing evidence of Native American activity and/or to sites of cultural importance.

Policy ERM-6.9 – Confidentiality of Archaeological Sites: The County shall, within its power, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

Policy ERM-6.10 – Grading Cultural Resources Sites: The County shall ensure all grading activities conform to the County's Grading Ordinance and California Code of Regulations, Title 20, § 2501 et. seq.

Tulare County Code

The Tulare County Code does not contain any regulations or requirements specific to cultural, historical and/or archeological resources.

3.5.4 Significance Thresholds

3.5.4.1 Appendix G Thresholds from the State CEQA Guidelines

Appendix G of the State CEQA Guidelines provides thresholds of significance for determining whether a project could have a significant effect on the environment. According to Appendix G, a project could have a potentially significant impact on cultural and paleontological resources if the project would:

a) *Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5 of the State CEQA Guidelines.*

b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5 of the State CEQA Guidelines.*

c) *Disturb any human remains, including those interred outside of formal cemeteries.*

3.5.4.2 Additional Thresholds of Significance

Requirements identified in the County policies and plans are addressed by the CEQA Appendix G significance criteria above.

The CRHR criteria were also utilized by Æ to evaluate the CEQA Appendix G significance criteria. The CRHR criteria are based on NRHP criteria. As discussed in Section 3.5.3.2, for a property to be eligible for inclusion on the CRHR, one or more of the following criteria must be met:

1. *It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;*
2. *It is associated with the lives of persons important to local, California, or U.S. history;*

3. *It embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of a master, possesses high artistic values; and/or*
4. *It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.*

In addition to meeting one or more of the above criteria, the CRHR requires that sufficient time has passed since a resource's period of significance to "*obtain a scholarly perspective on the events or individuals associated with the resources.*" (CCR 4852 [d][2]). The California Register also requires that a resource possess integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association. There are no additional thresholds of significance related to the topical environmental issue.

3.5.5 Methodology of Analysis

This analysis is based on the review of applicable federal, state and local requirements, Project design features, best management practices (BMP's), operating practices and other environmental protection measures that have been incorporated into the Project to minimize potential impacts on the environment. Impacts to cultural resources are assessed based on the potential for a project to adversely affect existing known and unknown historic and archaeological resources. This requires an analysis of whether there are significant historical resources on-site or within the vicinity of the Project area, and whether the Project would result in a substantial adverse change (i.e., physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings) in the significance of a resource. The significance of historical resources is defined in Section 3.5.4.

3.5.5.1 Records Search

Æ requested records searches from the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield in October 2013 and November 16, 2020. These searches encompassed all land within a 0.5-mile radius of the Project area. Sources consulted included archaeological site and survey base maps, reports of previous investigations, cultural resource records, the listings of the National Register of Historic Places, the Historic Property Data File (3/18/2013), the California Historical Landmarks, the California Register of Historical Resources, the California Inventory of Historic Resources, the California Points of Historical Interest, and the Built Environment Resources Directory (see Appendix E).

Æ's first records search request was submitted to the SSJVIC on October 10, 2013, and results were returned on October 14, 2013 (RS# 13-403). Æ requested a supplementary records search to capture new resources or studies that have occurred in the Project vicinity since the 2013 investigations. The second records search was requested on November 16, 2020, and was returned on November 30, 2020. The results of both records searches are provided below. Until Æ's investigations in 2013 (TU-1668), no cultural resources studies had occurred within the Project area. Three (3) cultural resource investigations have occurred within a 0.5-mile radius of the Project (see Table 3.5-1), one (1) of which (TU-01365)

overlaps slightly with a portion of the survey. The cultural resource records search is summarized below in Table 3.5-1.

Table 3.5-1. Previous Cultural Resources Studies within 0.5 Mile of the Project Area

SSJVIC Report No.	Report Author(s)	Report Date	Report Title
TU-01365	Pruett, Catherine	2009	A Cultural Resource Assessment for Approximately 30 Acres, Located Northeast of Visalia, Tulare County, California
TU-01394	Parr, Robert	2009	Cultural Resource Assessment for the Replacement of Eleven Deteriorated Power Poles on the Southern California Edison Company Bravo, Cairns, Campbell, Homer, Merryman, and Redbanks 12 kV Circuits, Tulare County, California
TU-01498	Leach-Palm, Laura; Brandy, Paul; King, Jay; Mikkelsen, Pat; Seil, Libby; Hartman, Lindsay; and Bradeen, Jill	2010	Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties

Until 2013, no resources had been recorded within the Project area, but five (5) resources were identified within 0.5 miles of the Project area (see Table 3.5-2): four (4) historic-era resources (P-54-004034, -004587, -004615, and -004676) and one (1) prehistoric habitation site located across the Kaweah River (P-54-000316). P-54-004676 was mistakenly mapped by the SSJVIC within the Project area, but a review of the site record found that it is on the St. Johns River, just outside both the Project area and the survey area. The site record describes P-54-000316 as a "village site" but provides no information regarding the site constituents. Documentation of the records searches is included in Appendix E, and summarized below in Table 3.5-2.

Table 3.5-2. Previously Recorded Resources within 0.5 Mile of the Project Area

Primary No.	Date Recorded	Prehistoric/ Historic	Description
P-54-004676	2008	Historic	Historic-era diversion dam (built in 1938)
P-54-004587	2008	Historic	Historic-era recreation area
P-54-000316	Unknown	Prehistoric	Probable habitation site
P-54-004034	2001	Historic	Historic-era electric railroad (built in 1905)
P-54-004615	1999	Historic	Historic-era ditch (built in 1878)

Æ also examined the historic United States Geological Survey (USGS) topographic maps of the Project area. The 1928 Lemon Cove and 1952 Woodlake 7.5-minute quadrangles (the name of the quadrangle was changed from Lemon Cove to Woodlake in 1952) show no infrastructure in the Project area itself, although the 1928 map shows a small dam on the St. Johns River downstream of the Project area. The 1952 map shows the current dam (P-54-004676) adjacent to the Project area and notes that the St. Johns River has gone dry. The 1969 revision to the 1952 map indicates water once again flowing in the St. Johns

River and depicts dirt roads within the Project area (the same dirt roads still exist and were used by Æ during survey). The Project area is surrounded by the historic Visalia Electric Railroad, but this section of the electric railroad has not been formally recorded and does not intrude into the Project area.

3.5.5.2 Native American Outreach

On September 30, 2013, Æ contacted the Native American Heritage Commission (NAHC) on behalf of TID to request a search of its Sacred Lands File to identify any Native American cultural resources recorded in the Project area. Æ also requested a list of individuals and groups with whom TID may consult regarding resources of sacred or special cultural and spiritual significance in the Project area. On October 2, 2013, Æ sent letters describing the Project and its location to the contacts identified by the NAHC (listed below).

- Neil Peyron, Chairperson, Tule River Indian Tribe;
- Lalo Franco, Cultural Coordinator, Santa Rosa Tachi Rancheria;
- Kenneth Woodrow, Chairperson of the Wuksache Indian Tribe/Eshom Valley Band;
- John Sartuche of the Wuksache Tribe;
- Jennifer Malone; and
- Kerri Vera, Environmental Department, and Joey Garfield, Tribal Archaeologist, Tule River Indian Tribe.

On October 14, 2013, Æ sent a follow-up e-mail or made a phone call to those contacts that had not yet responded. A contact log and copies of the Native American outreach documentation are included in Appendix E.

On October 2, 2013, the NAHC responded to Æ's request and stated that the Sacred Lands File did not indicate the presence of sacred sites in the Project area. The NAHC provided Æ with a list of individuals and organizations to be contacted regarding information on Native American cultural resources in the Project area. Æ sent a letter soliciting concerns about the Project to the each of the individuals and tribes on October 2, 2013. Follow-up phone calls were made and emails sent on October 14, 2013. No further outreach was undertaken in 2020. The TID is responsible for government-to-government Native American consultation pursuant to CEQA and Assembly Bill (AB) 52.

To date, Æ has received responses from two (2) of the seven (7) individuals contacted, as summarized in Table 3.5-3 below. A copy of Æ's Native American outreach log is provided in Appendix E.

Table 3.5-3. Excerpt from the Native American Outreach Log

Individual/Organization	Contact	Comments
Santa Rosa Rancheria Tachi Yokut Tribe	Shana Brum	Brum stated that the Project is in a highly sensitive area and requested an on-site meeting and Native American monitoring during ground-disturbing activities. Brum further recommended that the Project proponent contact the Wukchumni Tribe.

Individual/Organization	Contact	Comments
Wuksache Tribe	Johnny Sartuche	Sartuche stated that the Project area is sensitive for cultural resources and requested that he be notified of any resources identified. He further recommended that the Project not proceed due to the sensitivity of the area.

3.5.5.3 Field Survey

Æ archaeologists Matthew Armstrong and Elizabeth Rapp conducted a pedestrian survey of the Project area using 15- to 20-meter transects on October 7th and 11th, 2013. The approximately 175-acre survey area encompassed the Project site, including the banks of the St. Johns River adjacent to the Project's southern boundary.

When an artifact or feature was encountered that appeared to be of historic age (i.e., 45 years old or older), surveyors marked its position and closely examined the surrounding area for associated artifacts and/or features. Cultural resources identified within the Project area were mapped using a Trimble GeoXH hand-held Global Positioning System (GPS) and documented on California Department of Parks and Recreation (DPR) 523 series cultural resources inventory forms. Cultural resources and survey conditions were photographed using a Canon Powershot A810 digital camera. Methods and field observations were recorded on Æ's Daily Work Record and Survey Field Record forms. All photographs and field notes are on file at Æ's Fresno office. Also see Section 3.5.2.3 above which summarizes the results of Æ's field surveys.

3.5.5.4 Project Design Features and Environmental Protection Measures

Numerous design features, best management practices (BMPs), operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental protective measures that were considered during this evaluation include, but are not limited to, the following:

- Employee training programs will be conducted to educate personnel of sensitivity issues including but not limited to cultural resources.
- Blasting would not be used for the excavation phase of the Project.

3.5.6 Project-Level Impacts and Mitigation Measures

3.5.6.1 Historical Resources

Impact Statement

Impact CUL-1: *Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?* **(CEQA Guidelines Threshold Criteria (a))**

Impact Analysis

As discussed in Section 3.5.2.3 above, Æ discovered one historic-era isolate P-54-005095 and one prehistoric isolate P-54-005096 within the Project site. Isolates are objects lacking clear associations with other materials, time, or people, and as such can provide only limited information regarding history and prehistory. P-54-005095 and P-54-005096 are not unique, rare, or otherwise exceptional, and thus they are considered insignificant resources a priori under CRHR criteria because they lack important associations and scientific data potential. No further treatment of these resources is recommended.

Based on Æ's site assessment (see Appendix E), the cultural resources identified within the Project site fail to meet the necessary requirements for recognition as historical resources. Based on the results of the cultural analysis, Æ recommended that no additional cultural resources work or monitoring is necessary during proposed Project activities. Although the current study has not indicated sensitivity for significant cultural resources within the Project site, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface during previous surveys. However, with the implementation of Mitigation Measure CUL-1 and Mitigation Measure CUL-2 described in Section 3.5.6.2 below, the Project would have a less than significant impact of historical resources.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

See Mitigation Measures CUL-1 and CUL-2 below.

Level of Significance After Mitigation

Less than significant.

3.5.6.2 Archaeological Resources

Impact Statement

Impact CUL-2: *Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?* **(CEQA Guidelines Threshold Criteria (b))**

Impact Analysis

As discussed in Section 3.5.2.3 above, Æ discovered one historic-era isolate P-54-005095 and one prehistoric isolate P-54-005096 within the Project boundary. Isolates are objects lacking clear associations with other materials, time, or people, and as such can provide only limited information regarding history and prehistory. P-54-005095 and P-54-005096 are not unique, rare, or otherwise exceptional, and thus they are considered insignificant resources a priori under CRHR criteria because they lack important associations and scientific data potential. No further treatment of these resources is recommended.

However, isolated prehistoric artifacts may indicate the potential for significant buried archaeological deposits. There is a potential for the Project to uncover significant intact buried archaeological or cultural deposits given the Project's position on the landform and proximity to a meandering river environment that would have provided habitat and rich sources for food and materials that would have sustained prehistoric Native American populations in the immediate area. Meandering river environments characterized by landforms that are subject to rapid alluvial deposition throughout time further increase the sensitivity of Project area. Further bolstering this point is the presence of a Native American site across the Kaweah River southeast of the Project area.

Because of the potential sensitivity for buried cultural resources in the Project area, Æ recommended two complimentary approaches to be completed prior to implementation of the Project: general Project area geoarchaeological testing and limited subsurface testing with shovels and augers at the location of P-54-005096. The latter would confirm if there is a larger intact buried archaeological deposit. If a more substantial deposit is identified, additional extended site testing would be needed to complete the CEQA-required assessment of the resource's significance and eligibility for inclusion in the CRHR. Geoarchaeological testing uses systems theory as a guiding framework to analyze patterns of geology, hydrology, sedimentology, and anthropogenic landscape use to interpret the potential for paleosols that may contain intact archaeological deposits within the study area (Applied EarthWorks, Inc., 2013, Updated 2021). Subsurface coring or trenching then focuses on investigating key areas identified as having moderate to high potential for containing anthropogenic paleosols. Application of these recommendations would provide the CEQA Lead Agency with a more complete understanding of the potential for Project activities to cause adverse impacts to historical resources within the Project area.

With implementation of Mitigation Measure CUL-1 and Mitigation Measure CUL-2, potential impacts to cultural resources will not exceed a level of significance.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CUL-1*: Prior to significant ground disturbance, conduct general geoarchaeological testing and limited subsurface testing with shovels and augers at the location of P-54-005096. If a large intact buried archaeological deposit is identified, additional extended site testing would be needed to complete the CEQA-required assessment of the resource's significance and eligibility for inclusion in the CRHR.*

Mitigation Measure CUL-2: *Consistent with state regulations, in the event archaeological resources are encountered during Project development or ground-disturbing activities within any portion of the Project site, all work within 100-feet (30 meters) of the find must be halted until a qualified professional archaeologist can identify the discovery and assess its significance. Such finds include, but are not limited to, prehistoric stone grinding implements, stone tools, soapstone bowls, ornaments (e.g., beads, pendants), features such as burned soil, earthen ovens, and floors of shelters as well as intact historic-era building foundations and concentrations of historic artifacts.*

Level of Significance After Mitigation

Less than significant.

3.5.6.3 Human Remains

Impact Statement

Impact CUL-3: *Would the Project disturb any human remains, including those interred outside of dedicated cemeteries?* **(CEQA Guidelines Threshold Criteria (c))**

Impact Analysis

No human remains were observed during Æ's field survey of the Project site. Although unlikely, the discovery of human remains is always a possibility. If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. With the implementation of Mitigation Measures CUL-3, potential impacts to this cultural resource will be less than significant. Also see the analysis and mitigation measures presented in Section 3.10 – Tribal Cultural Resources for more detail.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure CUL-3: *If human remains are uncovered within the Project site, the Tulare County Coroner is to be notified immediately and must investigate the discovery. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 requires that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend means of treatment for the human remains pursuant to California Public Resources Code 5097.98.6.*

Level of Significance After Mitigation

Less than significant.

3.5.7 Cumulative-Level Impacts and Mitigation Measures

The geographical context for the analysis of potentially cumulative impacts to cultural resources is the geographical area where the Project is located and includes the County of Tulare and the nearby City of Woodlake.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to cultural and historical resources.

Impacts to cultural resources are site-specific, yet the destruction and/or loss of such resources could be cumulatively significant if not collectively addressed by individual projects. All the cumulative projects are required to comply with local, state, and federal. The County General Plan includes policies requiring the identification and mitigation of cultural and archeological resources on a project-by-project basis as a means of protecting those resources countywide. Therefore, overall cumulative impacts associated with cultural resources are considered less than significant.

Additionally, the Project design features, BMPs and mitigation measures would prevent impacts to cultural and archeological resources from becoming significant at the project level. Therefore, the Project's contribution would also be cumulatively less than considerable. No additional mitigation measures are necessary. For these reasons, the Project would not contribute to cumulatively significant impacts related to cultural resources.

3.6 ENERGY

3.6.1 Introduction

This section of the DEIR presents a discussion of energy resources. A review of potential Project impacts is provided in the following analysis.

3.6.2 Environmental Setting

3.6.2.1 Regional and Local Setting

As discussed in Section 2.0 – Project Description, the Project would not result in an increase of employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. The electrical services required for the onsite processing equipment would be obtained from Southern California Edison (SCE). Additionally, the Project would provide a local source of aggregate to the County which would minimize the need to import aggregate from out-of-County sources, thus reducing fuel consumption associated with long distance trucking.

Based on knowledge of the proposed projects in the Project area, the Project would not conflict or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project would have no impact on renewable energy plans.

3.6.3 Regulatory Setting

In addition to the regulations and policies summarized below, energy efficiency is also regulated by climate change greenhouse gas (GHG) regulations. By having regulatory/policy goals for more electric vehicles and energy efficient engines, energy demands will be shifted (gas/diesel to electricity). Heavy duty off and on road tucks are required to phase into more efficient and cleaner engines under various air quality requirements. See Sections below for a detailed discussion of air quality regulations that also affect energy use.

3.6.3.1 Federal

Corporate Average Fuel Standards

First enacted by the U.S. Congress in 1975, the Corporate Average Fuel Economy (CAFE) standards reduce energy consumption by increasing the fuel economy of cars and light trucks. The National Highway Traffic Safety Administration (NHTSA) and United States Environmental Protection Agency (USEPA) jointly administer the CAFE standards. The U.S. Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given for: 1) technological feasibility; 2) economic practicality; 3) effect of other standards on fuel economy; and 4) need for the nation to conserve energy.

Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by USEPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction in fuel consumption from 6 to 23 percent over the 2010 baseline, depending on the vehicle type. USEPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through

2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type (USEPA and NHTSA, 2016).

Energy Policy Act of 2005

The Energy Policy Act of 2005 addresses energy efficiency; renewable energy requirements; oil, natural gas, and coal; alternative-fuel use; tribal energy, nuclear security; vehicles and vehicle fuels; hydropower and geothermal energy; and climate change technology. The act provides revised annual energy reduction goals (two percent per year beginning in 2006), revised renewable energy purchase goals, federal procurement of Energy Star or Federal Energy Management Program designated products, federal green building standards, and fuel cell vehicle and hydrogen energy system research and demonstration.

Energy Independence and Security Act of 2007

Signed into law in December 2007, the Energy Independence and Security Act was passed to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the energy performance of the federal government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The act included the first increase in fuel economy standards for passenger cars since 1975, and also included a new energy grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs.

3.6.3.2 State

Assembly Bill 1575 (AB 1575)

In 1975, largely in response to the oil crisis of the 1970s, the California State Legislature adopted Assembly Bill (AB) 1575, which created the California Energy Commission (CEC). The statutory mission of the CEC is to forecast future energy needs, license thermal power plants of 50 megawatts or larger, develop energy technologies and renewable energy resources, plan for and direct state responses to energy emergencies, and, perhaps most importantly, promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code Section 21100(b)(3) to require Environmental Impact Reports (EIRs) to consider the wasteful, inefficient, and unnecessary consumption of energy resources caused by a project. Since the passage of AB 1575, the California Natural Resources Agency finalized updates to the CEQA Guidelines in December 2018. New CEQA Guidelines Section 15126.2(b) treats "wasteful, inefficient, or unnecessary" energy consumption as a significant environmental impact. As a result, the following energy thresholds have been incorporated into Appendix G of the CEQA Guidelines (see Section 3.6.4):

a) *Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

b) *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

As discussed above, this DEIR section has been prepared to assess energy impacts in accordance with these CEQA Appendix G of criteria specific to energy resources.

California Energy Commission

The California Energy Commission (CEC) was created in 1974 to serve as the state's primary energy policy and planning agency. The CEC is tasked with reducing energy costs and environmental impacts of energy use, such as greenhouse gas emissions, while ensuring a safe, resilient, and reliable supply of energy.

Assembly Bill 32: California Global Warming Solutions Act of 2006

California Global Warming Solutions Act of 2006 (Assembly Bill 32) Assembly Bill 32 (Health and Safety Code Sections 38500–38599; AB 32), also known as the California Global Warming Solutions Act of 2006, commits the state to achieving year 2000 GHG emission levels by 2010 and year 1990 levels by 2020. To achieve these goals, AB 32 tasked the California Public Utilities Commission and CEC with providing information, analysis, and recommendations to the California Air Resources Board regarding ways to reduce GHG emissions in the electricity and natural gas utility sectors.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the Renewables Portfolio Standard (RPS) goals established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both investor-owned utilities and publicly-owned utilities from 50 percent to 60 percent by 2030. Incrementally, these energy providers must also have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. California must procure 100 percent of its energy from carbon free energy sources by the end of 2045.

Low-Carbon Fuel Standard

The Low-Carbon Fuel Standard (LCFS), established in 2007 through Executive Order S-1-07 and administered by CARB, requires producers of petroleum-based fuels to reduce the carbon intensity of their products, starting with 0.25 percent in 2011 and culminating in a 10 percent total reduction in 2020. Petroleum importers, refiners and wholesalers can either develop their own low-carbon fuel products or buy LCFS credits from other companies that develop and sell low-carbon alternative fuels, such as biofuels, electricity, natural gas, and hydrogen.

Senate Bill 1389

Senate Bill (SB) 1389 (Public Resources Code Sections 25300–25323; SB 1389) requires the CEC to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code Section 25301[a]). The most recent 2021 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California, including energy efficiency and reliability, decarbonizing buildings and California's natural has system, as well as forecasting California's energy demand and quantifying the benefits of clean transportation programs, such as California's transition to zero-emission vehicles (ZEVs).

The 2021 Report also provides updates on trends in California's sources of crude oil, update on California's nuclear plants, and other energy issues.

Advanced Clean Car Program

The Advanced Clean Cars emissions-control program was approved by the California Air Resources Board (CARB) in 2012 and is closely associated with the Pavley regulations. The program requires a greater number of zero-emission vehicle models for years 2015 through 2025 to control smog, soot, and GHG emissions. This program includes the Low-Emissions Vehicle (LEV) regulations to reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles; and the Zero-Emissions Vehicle (ZEV) regulations to require manufactures to produce an increasing number of pure ZEVs (meaning battery and fuel cell electric vehicles) with the provision to produce plug-in hybrid electric vehicles (PHEVs) between 2018 and 2025.

Senate Bill 350

SB 350 was approved on October 7, 2015. SB 350 will: 1) increase the standards of the California Renewables Portfolio Standard (RPS) program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; 2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; 3) provide for the evolution of the Independent System Operator into a regional organization; and 4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. Among other objectives, the State legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

California Assembly Bill 1493 (AB 1493, Pavley)

In response to the transportation sector accounting for more than half of California's greenhouse gas (GHG) emissions, Assembly Bill (AB) 1493 (commonly referred to as CARB's Pavley regulations), enacted in 2002, requires CARB to set GHG emission standards for new passenger vehicles, light-duty trucks, and other vehicles manufactured in and after 2009 whose primary use is non-commercial personal transportation. Phase 1 of the legislation established standards for model years 2009-2016 and Phase 2 established standards for model years 2017-2025 (CARB, 2017).

California Energy Code (Title 24, Part 6, Building Energy Efficiency Standards)

California Code of Regulations Title 24, Part 6 comprises the California Energy Code, which was adopted to ensure that building construction, system design and installation achieve energy efficiency. The California Energy Code was first established in 1978 by the CEC in response to a legislative mandate to reduce California's energy consumption, and apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and nonresidential buildings.

3.6.3.3 Local

County of Tulare – General Plan

The Tulare County – General Plan (Tulare County, 2012) has a number of policies that apply to projects within Tulare County that support reduction efforts of GHG. General Plan policies that relate to the proposed Project are listed as follows:

> ***AG-2.11 – Energy Production:*** *The County shall encourage and support the development of new agricultural related industries featuring alternative energy, utilization of agricultural waste, and solar or wind farms.*
>
> ***ERM-4.1 – Energy Conservation and Efficiency Measures:*** *The County shall encourage the use of solar energy, solar hot water panels, and other energy conservation and efficiency features in new construction and renovation of existing structures in accordance with State law.*
>
> ***ERM-4.3 – Local and State Programs:*** *The County shall participate, to the extent feasible, in local and State programs that strive to reduce the consumption of natural or man-made energy sources.*
>
> ***ERM-4.6 – Renewable Energy:*** *The County shall support efforts, when appropriately sited, for the development and use of alternative energy resources, including renewable energy such as wind, solar, bio-fuels and co-generation.*

3.6.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Energy" a project is considered to have a significant impact on the environment if it would:

a) *Result in potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources, during the project construction or operation (CEQA Appendix G Threshold (a))?*

b) *Conflict or obstruct a state or local plan for renewable energy or energy efficiency (CEQA Appendix G Threshold (b))?*

3.6.5 Methodology of Analysis

The following points were considered in terms of the Project's potential effects related to energy resources:

- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The Project will be managed so that when recycling and/or blending activities were taking place, the excavation and processing of aggregated would be reduced such that the total emissions associated with excavation/processing of aggregate combined with the emissions associated with the transport and processing/blending of recycled materials and additives would not result in an increase to baseline.

- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.
- An existing SCE electric connection is located at the northern boundary of the Project.
- Activities associated with the Project will comply with all applicable rules and regulations.

3.6.6 Project-Level Impacts and Mitigation Measures

3.6.6.1 Wasteful, Inefficient or Unnecessary Consumption of Energy Resources

Impact Statement

Impact ENG-1: *Would the Project result in potentially significant environmental impact due to wasteful, inefficient or unnecessary consumption of energy resources, during the project construction or operation?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

As discussed above, the Project would not result in an increase of employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. The electrical services required for the onsite processing equipment would be obtained from SCE. Additionally, the Project would provide a local source of aggregate to the County which would minimize the need to import aggregate from further away, thus reducing fuel consumption associated with long distance trucking. For these reasons, the Project would have no significant impacts on energy resources, or result in a wasteful, inefficient or unnecessary consumption of energy resources.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.6.6.2 Conflict or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency

Impact Statement

Impact ENG-2: *Would the Project conflict or obstruct a state or local plan for renewable energy or energy efficiency?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

As discussed above, the Project would not result in an increase of employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. Additionally, the Project would provide a local source of aggregate to the County which would minimize the need to import aggregate from out-of-County sources, thus reducing fuel consumption associated with long distance trucking. For these reasons, the Project would have no significant impacts on energy resources. Based on knowledge of the proposed projects in the Project area, the Project would not conflict or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the Project would have no impact on renewable energy plans.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.6.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3.0-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3

miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to energy resources.

As discussed above, the Project would have no specific impacts related to energy resources. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to energy resources.

3.7 GEOLOGY AND SOILS

3.7.1 Introduction

This section of the DEIR provides analyses of geology, soils and paleontological related impacts of the Project. Geotechnical hazards analyzed also include seismic hazards, and slope stability. The information provided in this section was derived from the following studies, which are included in the appendices of this DEIR:

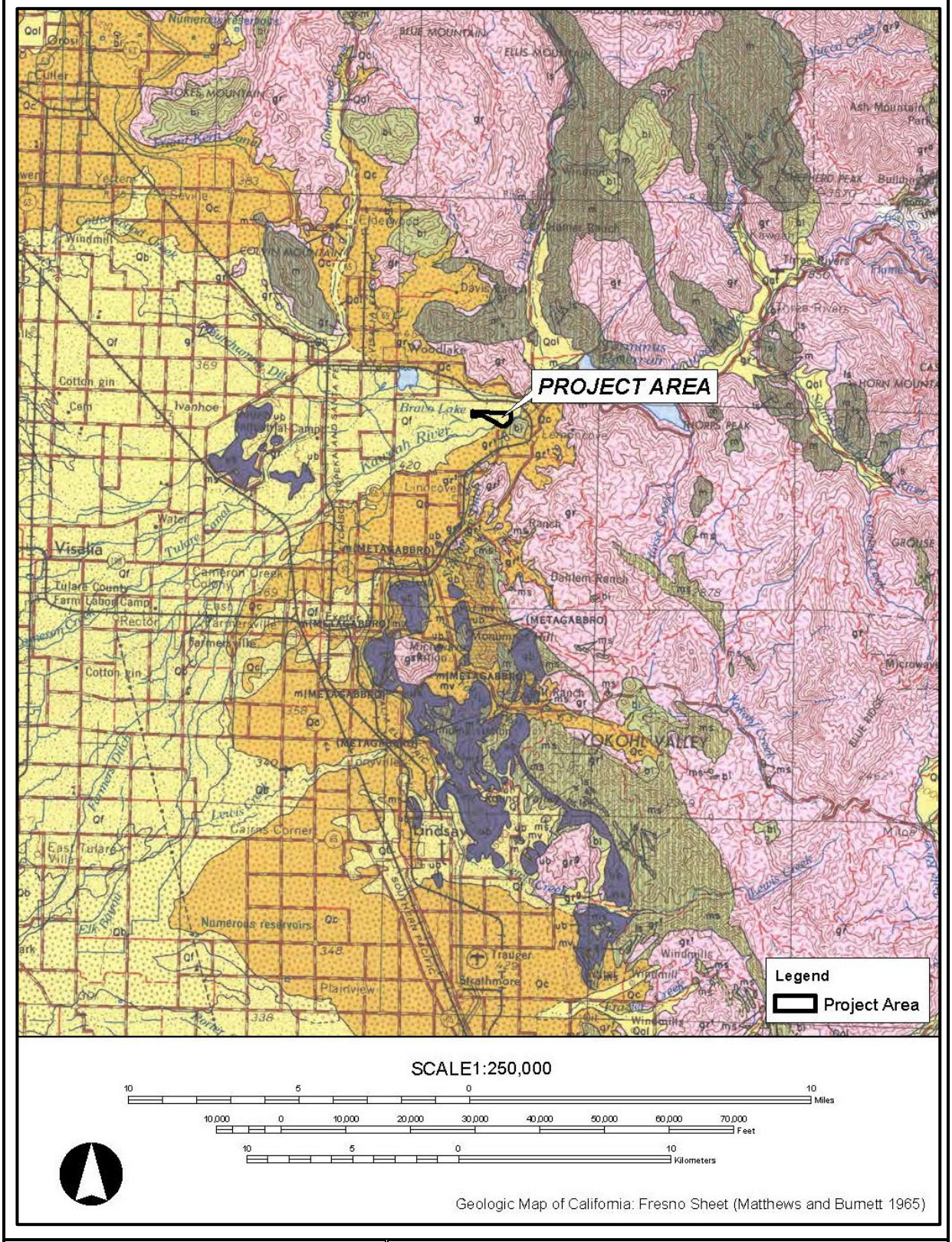
- *McKay Point Reservoir Project – Geology and Soils Technical Study,* prepared by Osma Pekin, PhD, P.E., G.E., and Ian Hutchison, PhD., P.E., SLR International Corp. (SLR, 2021) (Appendix F1).
- *Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California*, BSK Associates, Engineers and Laboratories (BSK Associates Engineering & Laboratories, 2011) (Appendix F2).
- *Paleontological Resource Assessment for the McKay Point Reservoir Project,* Applied EarthWorks, Inc. (Applied EarthWorks, Inc., 2014) (Appendix E2).
- *Addendum to Paleontological Resource Assessment for the McKay Point Reservoir Project,* Applied EarthWorks, Inc. (Applied EarthWorks, Inc., 2021) (Appendix E3).

3.7.2 Environmental Setting

3.7.2.1 Regional Setting

The Project is located in the San Joaquin Valley, which is the southern portion of the Central Valley of California. The Central Valley formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west. The Central Valley is an alluvial plain approximately 50 miles wide and 400 miles long (north-south). Sediments have been deposited into the Central Valley for the last 160 million years, and can be thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Project site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone. Beneath these rocks lie impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000-feet below ground surface (bgs). A geologic map of the region is included as Figure 3.7-1.



Source: (Applied EarthWorks, Inc., 2014)

Figure 3.7-1 Geology in the Vicinity of the Project

3.7.2.2 Vicinity & Project Site Setting

A total of six soil borings were conducted at the Project site in November 2011 (BSK Associates Engineering & Laboratories, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Reservoir area ranges between approximately 40- and 100-feet bgs. Alluvial deposits at the Project site consist of sand that is about 15- to 20-feet thick. Luhrdorff and Scalmanini (1995) describe these upper alluvial sediments as Younger Alluvium. Below this, cobbles, boulders with sand, silt, and clay are common. These deposits extended to a depth of about 40-feet bgs on the eastern portion of the Project site, and to about 100-feet bgs on the western portion. Luhrdorff and Scalmanini (1995) describe these lower alluvial sediments as Older Alluvium. Geologic cross-sections for the Project site have been prepared by Schmidt (2012) and SES (2012), which are included in Attachment A of the Geology and Soils Technical Study (SLR, 2021) located in Appendix F of this DEIR.

Weathered bedrock was not encountered in borings on the western portion of the Project site, but was encountered at approximately 77-feet bgs in two borings drilled at the eastern portion of the Project site. The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within a few miles to the north, east and south of Project site. The weathered bedrock is presumed to underlie the entire Project site, but is apparently present at various depths (refer to Attachment A of the Geology and Soils Technical Study (SLR, 2021)) located in Appendix F of this DEIR. Discontinuous intrusions of clay or clayey sand were also occasionally encountered (SES, 2012).

Faults and Seismicity

The Project site is located in the eastern portion of the San Joaquin Valley, which is an area of relatively moderate seismicity for California. This area is centrally located between two zones of significant seismicity: the Eastern Sierra Seismic Zone (located approximately 50 miles to the east) and the San Andreas Fault Zone (located approximately 80 miles to the west). There are no active or potentially active faults within 30 miles of the Project site. The nearest potentially active fault is the Independence Fault located 48 miles to the east. This fault is part of the Owens Valley Fault Zone, which is capable of producing large earthquakes, such as the Owens Valley Earthquake of 1872, which measured 7.4 on the Richter Scale.

Soils, Erosion and Slope Stability

The Project site is essentially flat, with a slight topographic slope to the south and west. The Project site is undeveloped, so erosion is minimal and there are no obvious slope failures at the Project site. Soil erosion is limited to the relatively steep slopes facing the St. Johns River at the southern portion of the Project site, and select portions of the few man-made dirt roads at the Project site. Other than these small areas, the Project site is almost 100 percent covered with vegetation, primarily grasses. The upper 5- to 10-feet of the onsite soil consists of poorly-graded sand with increasing gravel at depth. Below 15-feet, the soil consists of sandy and silty gravel of increasing size and rounded cobbles to approximately 30- to 35-feet bgs. At greater depth, silty clayey sand and silty clay/low plasticity clay are predominant before bedrock is encountered (BSK Associates Engineering & Laboratories, 2011).

Paleontological Setting

The Addendum to Paleontological Resources Assessment (PRA) prepared by Applied EarthWorks, Inc. (Applied EarthWorks, Inc., 2021) discusses the vicinity around the Project site in detail. A copy of the PRA is provided in Appendix E3. The following is a summary of the two formations found in the area of the Project that have high paleontological sensitivity.

Modesto Formation (Qf)

The Modesto Formation is late Pleistocene in age and consists of poorly indurated fluvial and alluvial deposits and well-developed soils (Davis and Hall, 1959; Marchand and Allwardt, 1981). The sediments consist of andesitic to arkosic granitic sand, silt, and gravel, which drained from the Sierra Nevada during the late Pleistocene Wisconsin glaciations (Weissmann et al., 2002). The Modesto Formation extends from the Sacramento River in the north to the Tule River in the south (Matthews and Burnett, 1965).

Local deposits of Holocene alluvial sediments cover the Modesto Formation. An unconformable contact marks the boundary between the Modesto Formation and the underlying middle Pleistocene Riverbank Formation. The Modesto Formation was first described by Davis and Hall (1959) and later redescribed by Marchand (1977) at its type section located at a road cut near the Mitchell Road Bridge above the Tuolumne River in the town of Ceres, California.

Marchand (1977) informally divides the Modesto Formation into a lower and upper member based on topographic expression and the presence of paleosols (i.e., buried soil horizons). The upper member has a maximum thickness of 30-feet and the lower member is up to 70-feet thick (Marchand and Allwardt, 1981). The upper member is composed of massive to well-bedded sand, silt, and clay, with subordinate gravel deposits. Where stratification is absent, the sedimentary structures were most likely destroyed by soil development. The lower member is predominately composed of moderately stratified sand and silt deposits, with localized lenticular cross-lamination. Where exposed, the base of lower member of the Modesto Formation is marked by a distinct layer of red clay (Hudson, 1960).

The total thickness of the Modesto Formation ranges from 50- to 100-feet and its age is estimated to range from 9,000 to 42,000 years before present (B.P.) (Marchand, 1977). These depths are characteristic of the Modesto Formation near its type section in center of the San Joaquin Valley where sediment accumulation has been significant. Adjacent to the Sierran foothills, in the vicinity of the Project area, basement rock is near the surface and sediment accumulation is shallower. Borings from the geotechnical report for the Project do not specify sediments by formation, but sand, silt, and gravel likely from the Modesto Formation, are noted at depths up to 35-feet bgs (Lau and Schwartz, 2011).

The Modesto Formation is generally categorized as having paleontological sensitivity and, therefore, contributes to the sensitivity determination of the Project area. Paleontological details supporting this ranking are provided in the PRA (Applied EarthWorks, Inc., 2021) located in Appendix E3.

Riverbank Formation (Qc)

The middle Pleistocene Riverbank Formation consists of granitic sand, silt, and clay primarily derived from the Sierra Nevada (Davis and Hall, 1959). In the vicinity of the Project area elsewhere in Tulare County, the Riverbank Formation is unconformably underlain by Mesozoic granitic rocks (mapped as granitic sand by Matthews and Burnett [1965]). Davis and Hall (1959) first described the Riverbank Formation, which was later redescribed by Marchand and Allwardt (1981) at its type section located on the banks of the Stanislaus River in the town of Riverbank.

The Riverbank Formation consists of moderately consolidated deposits of massive to well-bedded silty sand, arkosic sand, pebbly sand, and gravel lenses. Locally, fine sand may exhibit eolian sorting and coarse sand and gravel may be interbedded with silt and clay deposits (Marchand, 1977). These sediments comprise older alluvium, dissected fan, and nonmarine sedimentary deposits in the San Joaquin Valley (Smith, 1964; Matthews and Burnett, 1965). The thickness of the Riverbank Formation ranges from approximately 50- to 250-feet in the San Joaquin Valley and it is estimated to range in age from 130,000 to 450,000 thousand years (Marchand and Allwardt, 1981). Borings from the geotechnical report indicate sediments likely attributed to the Riverbank Formation as at least 30-feet thick, with granitic rock at depths of approximately 65- to 80-feet bgs in the eastern half of the Project area (Lau and Schwartz, 2011).

The Riverbank Formation is generally categorized as having paleontological sensitivity and, therefore, contributes to the sensitivity determination of the Project area. The PRA provides paleontological details supporting this ranking.

3.7.3 Regulatory Setting

3.7.3.1 Federal

Uniform Building Code

The 1997 Uniform Building Code (UBC) was developed by the International Conference of Building Officials (ICBO) and is used by most states, including California, as well as local jurisdictions to set basic standards for acceptable design of structures and facilities. The UBC provides information on criteria for seismic design, construction, and load-bearing capacity associated with various buildings and other structures and features. Additionally, the UBC identifies design and construction requirements for addressing and mitigating potential geologic hazards. New construction generally must meet the requirements of the most recent version of the UBC.

Earthquake Hazards Reduction Act

Enacted in 1972, The Earthquake Hazards Reduction Act (EHRA) was promulgated to reduce the risks to human life and property associated with earthquakes in the United States. The law provides developing and implementing the National Earthquake Hazard Reduction Program (NEHRP), which defines the program goal and objectives, and scope of the agency's responsibilities. The program is focused on identifying seismic hazards and vulnerabilities, as well their risk and probability of occurrence. The NEHRP

also supports planning and building code requirements such as emergency evacuation responsibilities and seismic code standards.

3.7.3.2 State

Alquist-Priolo Earthquake Fault Zone Act

The State Alquist-Priolo Earthquake Fault Zoning Act (A-P Act) of 1972 (Cal. Pub. Resources Code §2621 et seq.) was passed to mitigate the hazards associated with surface faulting in California. Administered by the California Department of Conservation, the A-P Act prevents construction of buildings used for human occupancy on the surface traces of active faults. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act of 1990

The 1990 Seismic Hazards Mapping Act (Cal. Pub. Resources Code §2690 et seq.) and related regulations establish a statewide minimum public safety standard for mitigation of earthquake hazards. The purpose of this Act is to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure as well as other hazards caused by earthquakes. The Act provides the minimum level of mitigation needed to reduce the risk of a building collapse. Under this Act, the lead agency can withhold permits until geologic investigations are conducted, and mitigation measures are incorporated into building plans. In addition, the Act addresses not only seismically induced hazards but also expansive soils, settlement, and slope stability. The program and actions mandated by this Act closely resemble those of the A-P Act by requiring the State Geologist to delineate various “seismic hazard zones” and providing cities, counties, and/or other local permitting bodies with the authority to regulate certain development “projects” within these zones by withholding the development permits for a site until the geologic and soil conditions are investigated and appropriate mitigation measures (if required) are incorporated into development plans.

California Building Code

The California Building Code (CBC), known as Title 24, CCR, Part 2, specifies the acceptable design and construction requirements associated with various facilities or structures. These requirements are administered and updated by the California Building Standards Commission. This Code specifies criteria for open excavation, seismic design, and load-bearing capacity directly related to construction in the State. The CBC augments the UBC and provides information for specific changes to various sections therein. The seismic building requirements under the CBC are more stringent than the Federal UBC.

Surface Mining and Reclamation Act (SMARA)

With respect to addressing geotechnical slope stability for final reclamation slopes, SMARA (Cal. Pub. Resources Code §2710 et seq.) does not specify a minimum factor of safety for slope stability. However, § 3502(b)(3) of SMARA Regulations (14 CCR §3502) states:

> "*The designed steepness and proposed treatment of the mined lands' final slopes shall take into consideration the physical properties of the slope material, its probable maximum water content, landscaping requirements, and other factors. In all cases, reclamation plans shall specify slope angles flatter than the critical gradient for the type of material involved. Whenever final slopes approach the critical gradient for the type of material involved, regulatory agencies shall require an engineering analysis of the slope stability. Special emphasis on slope stability and design shall be necessary when public safety or adjacent property may be affected.*"

§ 3704(d) requires final reclaimed fill slopes to be 2H:1V (horizontal to vertical) or flatter, except when site-specific geologic and engineering analysis demonstrate that the proposed final slope would have a minimum slope stability factor of safety that is suitable for the proposed end use, and when the proposed final slope can be successfully revegetated. § 3704(f) further states:

> "*Cut slopes, including final highwalls and quarry faces, shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conform with the surrounding topography and/or approved end use."*

California Public Resources Code (PRC 5097) – Paleontological Resources

In California, paleontological resources are protected under state policies and regulations in the Public Resources Code (PRC). Moreover, paleontological resources are recognized as nonrenewable resources and receive protection under the PRC and California Environmental Quality Act (CEQA). Requirements for paleontological resource management are included in the PRC Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, which states: No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. These statutes prohibit the removal, without permission, of any paleontological site or feature from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof.

3.7.3.3 Local

Tulare County General Plan Policies

The Tulare County General Plan (Tulare County, 2012) outlines several goals and policies related to seismic and geologic hazards, as well as paleontological resources for projects within their jurisdictional area. These goals and policies are summarized as follows:

Section 8.7 – Soil Resources

Goal ERM-7: To preserve and protect soil resources in the County for agricultural and timber productivity and protect public health and safety.

Policy ERM-7.1 – Soil Conservation: The County of Tulare shall establish the proper controls and ordinances for soil conservation.

Policy ERM-7.3 – Protection of Soils on Slopes: Unless otherwise provided for in this General Plan, building and road construction on slopes of more than 30 percent shall be prohibited, and development proposals on slopes of 15 percent or more shall be accompanied by plans for control or prevention of erosion, alteration of surface water runoff, soil slippage, and wildfire occurrence.

Section 10.2 – Geologic and Seismic Hazards

Goal HS-2: To reduce the risk to life and property and governmental costs from seismic and geologic hazards.

Policy HS-2.8 – Alquist-Priolo Act Compliance: The County shall not permit any structure for human occupancy to be placed within designated Earthquake Fault Zones (pursuant to and as determined by the Alquist-Priolo Earthquake Fault Zoning Act; Public Resource code, Chapter 7.5) unless the specific provision of the Act and Title 14 of the California Code of Regulations have been satisfied.

3.7.4 Significance Thresholds

3.7.4.1 Appendix G Thresholds from the State CEQA Guidelines

According to Appendix G of the CEQA Guidelines, the Project would have a significant effect if it would:

a) Directly or indirectly cause potential substantial adverse effects, involving the risk of loss, injury, or death involving:

- *I. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zone Map issued by the State Geologist for the area or based on other substantial evidence of known fault. Refer to Division of Mines and Geology Special Publication 42;*
- *II. Strong seismic ground shaking;*
- *III. Seismic-related ground failure, including liquefaction; or*
- *IV. Landslides.*

b) Result in substantial soil erosion or the loss of topsoil.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to the life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

3.7.4.2 Additional Threshold of Significance

Requirements identified in the County policies and plans are addressed by the significance criteria above. There are no additional thresholds of significance related to geology and soils.

3.7.5 Methodology of Analysis

To evaluate potential impacts to geology, soils and paleontological resources field studies and the following technical reports were prepared:

- *McKay Point Reservoir Project – Geology and Soils Technical Study* (SLR, 2021).
- *Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs* (BSK Associates Engineering & Laboratories, 2011).
- *Paleontological Resource Assessment, McKay Point Reservoir Project* (Applied EarthWorks, Inc., 2014).
- *Addendum to Paleontological Resource Assessment, McKay Point Reservoir Project* (Applied EarthWorks, Inc., 2021).

3.7.5.3 Geology and Soils

The geology and soil conditions of the Project were assessed through review of the following Project technical reports. Data from other publicly available documents was reviewed and evaluated, including the sources referenced in Appendix E and Appendix F – Geology and Soils Technical Study, Addendum to Paleontological Resources Assessment, and the other sources listed below.

- Department of Conservation, California Geologic Society, Special Publication 42, Interim Revision 2007 (ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf).
- Department of Conservation, California Geologic Society, Map Sheet 58: Susceptibility to Deep-Seated Landslides in California [2011]: (http://www.conservation.ca.gov/cgs/information/publications/ms/documents/ms58.pdf).
- Department of Conservation, California Geological Survey, Geologic Data Map No. 6: 2010 Fault Activity Map of California (http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html).
- Tulare County General Plan, August 2012, Figure 10-4 – Ground Shaking and Landslide Potential at page 10-13 (http://generalplan.co.tulare.ca.us/).

- Tulare County General Plan, August 2012, Figure 10-4 – Ground Shaking and Landslide Potential at page 10-13, and Figure 10-5 – Seismic/Geologic Hazards and Microzone at page 10-15 (http://generalplan.co.tulare.ca.us/).

The environmental setting of the Project site in relation to geology and soils is provided in Section 3.7.2.

Seismic Hazards – Surface Fault Rupture

Earthquake surface rupture is the physical displacement of surface deposits, either laterally or vertically, along a fault trace. Surface rupture is the surface expression of the subsurface fault movement and generally only occurs along or within a few hundred feet of the fault trace that moves during an earthquake. Not all large earthquakes have a surface expression or co-seismic surface rupture (e.g., blind thrust faulting associated with the 1994 Northridge, MW6.7 earthquake).

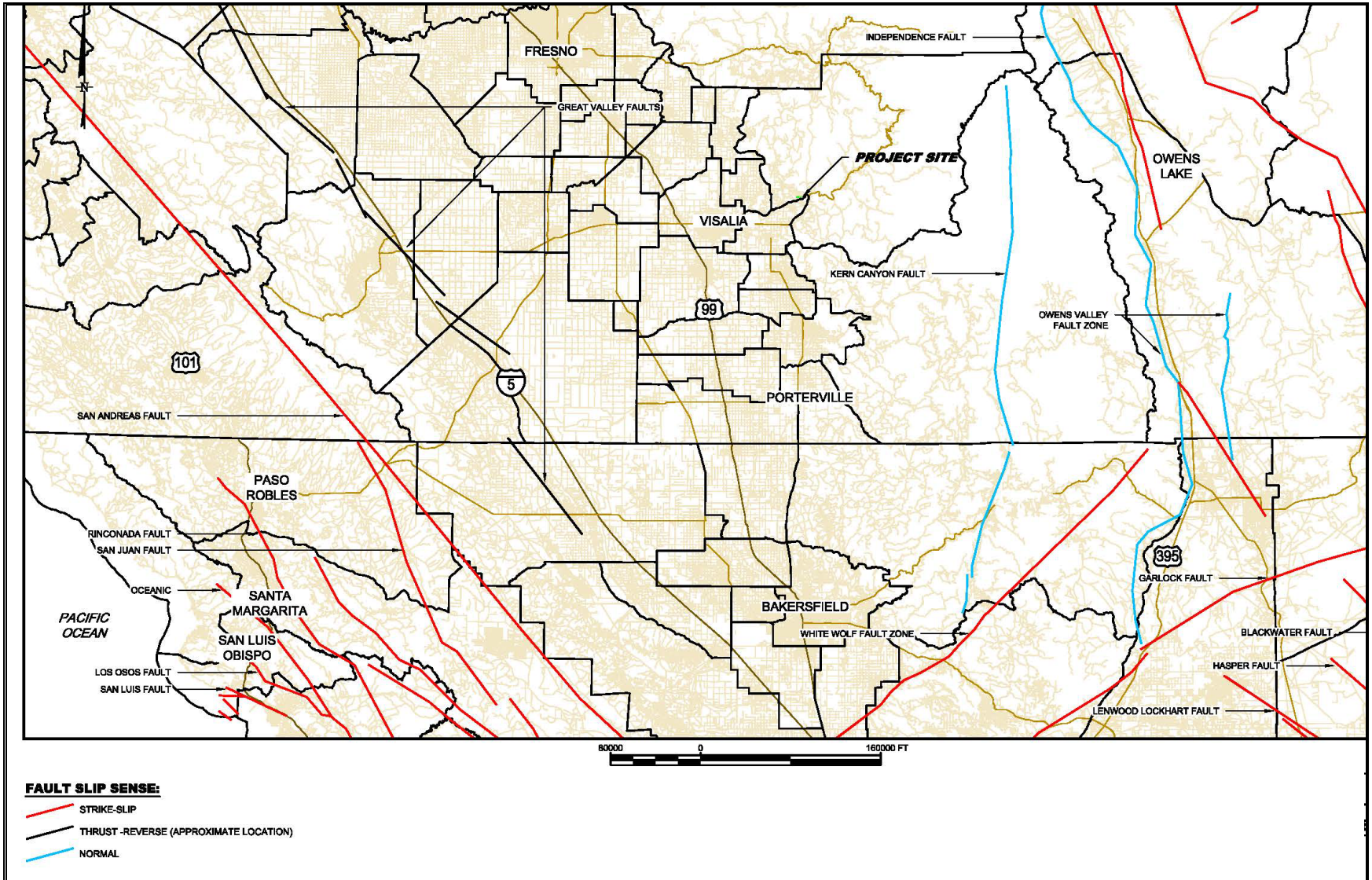
The Project is in Tulare County, which is not a designated Alquist-Priolo Earthquake Zone (APEZ) as issued in Special Publication 42 by the California Geological Survey (2007). Geographic areas are designed as APEZ if they encompass potentially active or recently-active faults.

A review of the 2014 fault activity map for California indicates that no active faults cross the Project site. Refer to Table 3.7-1 and Figure 3.7-2. The closest faults to the Project site are all located at least 35 miles from the site.

Table 3.7-1. Active or Potentially Active Faults within 75 Miles of the Project Site

Fault Zone	Approximate Distance (Miles)
Independence	48
Birch Creek	56
Great Valley (Segment 14)	56
Owens Valley	56
Great Valley 14 (Kettleman Hills)	56
South Sierra Nevada	60
Great Valley (Segment 13)	62
Round Valley	63
White Mountains	65
San Andreas Creeping Section Gridded	66
Hunter Mountain Connected	69
Hubter Mountain-Saline Valley	69
Little Lake	73
Great Valley (Segment 12)	73

Source: USGS (http://earthquake.usgs.gov/hazards/qfaults/)



Source: (SLR, 2021)

Figure 3.7-2 Active Faults Map

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Seismic Hazards – Strong Seismic Ground Shaking

Earthquakes on active or potentially active faults, depending on magnitude and distance from the Project site, can produce a range of ground-shaking intensities. Although there are no active faults within the immediate vicinity of the Project site, distant earthquakes have historically caused strong ground-motion in the Project site vicinity. The most significant example is perhaps the aforementioned Owens Valley Earthquake, which occurred in March of 1872. The epicenter was approximately 56 miles east of the Project site, but this earthquake is estimated to have caused strong (Mercalli Intensity, MM VI) shaking intensities in the area (Hough and Hutton, 2008).

The current state of practice to determine the seismic hazard at a given location is to perform a Probabilistic Seismic Hazard Analysis (PSHA), from which the probability of exceeding a specific ground motion parameter (typically the peak ground acceleration, or PGA) within a time period is calculated. Typically evaluated sets of probability and time-period are seismic events with 10 percent probability of occurrence in 50 years, and those with 2 percent probability of occurrence in 50 years. These probabilities correspond to return periods of 475 and 2,475 years respectively. The probability of exceedance of the ground motion parameter is calculated based on the following input parameters:

- Seismic sources that can generate ground shaking at the Project site;
- Characteristics of each seismic source: length, rate of ruptures, maximum magnitude, earthquake occurrence; and
- The ground motion parameter versus distance attenuation relationships appropriate for each seismic source and Site conditions.

Seismic sources include active and potentially active faults (or fault zones) in the vicinity of the Project site. Active faults are those that have experienced displacement within Holocene time (the past 11,000 years) whereas potentially active faults are those that have experienced displacement within Quaternary times (approximately past 1.6 million years).

The United States Geological Survey (USGS) website provides tools that are commonly used to identify the active and potentially active faults that could generate ground shaking at sites located in the United States. These tools are also used to perform the PSHA to estimate the level of ground shaking a given site may experience. These tools are based on the user defined location coordinates of the site, and a user defined radius of influence selected based on the general level of seismicity of the site. A typical radius used for such evaluations is on the order of 100 km (67 miles).

The maximum PGAs for the Project site were estimated to be 0.1 g for a return period of 475 years and 0.2 g for a return period of 2,475 years. PSHA outputs are included in Attachment G of the Geology and Soils Technical Study (Appendix F). It is noted that these PGA values are not equivalent to the seismic coefficient used in the pseudostatic slope stability analysis. Guidelines for Evaluating and Mitigating Seismic Hazards in California, SP-117 (California Geological Survey, 2008) states PGA should not be used

as a pseudostatic coefficient, as that would result in overly conservative factor of safety (FS). The generally accepted value for pseudostatic coefficient is 0.1, with an acceptable FS of the order of 1.1.

The Project site may be subjected to moderate to strong shaking based on correlations between PGA and the Modified Mercalli Intensity chart relating perceived shaking to PGA (Trifunac and Brady, 1975), provided by the USGS (Table 3.7-2).

Table 3.7-2. Modified Mercalli Intensity and Peak Ground Acceleration

Perceived Shaking	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Potential Damage	None	None	None	Very light	Light	Moderate	Moderate-Heavy	Heavy	Very Heavy
Peak Acc (% g)	<0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
Peak Vel (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+

Seismic Hazards – Ground Failure and Liquefaction

Settlement of the ground surface (i.e., ground failure) can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, uncompacted, and variable sandy sediments above the water table) due to the rearrangement of soil particles during prolonged ground-shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different amounts). Areas underlain by artificial fill are particularly susceptible to this type of settlement. Given the geologic setting of the Project site, the fluvial nature of sediment deposition and the absence of fill, seismically-induced ground failure is not a significant hazard.

Soil liquefaction is a condition in which saturated granular soils undergo a substantial loss of strength and deformation due to increased pore pressure, resulting from cyclic stress application induced by earthquakes. During liquefaction, the soil becomes sufficiently mobile to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are sand deposits that are saturated, loose, clean, uniformly-graded, and fine-grained. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo differential settlement. This would result in reduction of foundation stiffness and capacity. When this occurs, the structure can settle, tip, or even become buoyant and shift upwards. Liquefaction and associated ground failures could damage foundations, roads, underground cables and pipelines, and disrupt utility service.

Earthquake induced liquefaction typically occurs within the top 50-feet of liquefaction-prone soil, if those soils are saturated. A review of the logs associated with borings advanced at the Project site (BSK, 2011) indicates that the water table is at an average depth of 15 feet below grade (refer to Attachment C of

Appendix F – *Geology and Soils Technical Study*). The saturated soils below that depth are classified as silty sand to poorly-graded sandy silt and cobbles, as is illustrated in Table 3.7-3. The sieve analyses on the samples recovered at depth greater than 15 feet indicate silt contents on the order of 10 percent. Whereas these materials may generally be considered liquefiable, the presence of at least 10 percent of fines in the sand reduces the liquefaction potential of the sand. The depth of groundwater, combined with the anticipated level of ground shaking, means that the potential for liquefaction at the Project site is low.

Table 3.7-3. Representative Soils Cross-Section at McKay Reservoir Project Site

Layer	Description	Thickness (feet)	Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)	Hydraulic Conductivity (cm/s)
1	Poorly graded sand	13	36°	0	110	1.6×10^{-3}
2	Poorly graded sandy gravel	15	35°	0	120	2.25×10^{-3}
3	Silty clayey sand	42	33°	0	110	1.0×10^{-6}
4	Silty clay/low plasticity clay	25	28°	200	105	1.0×10^{-7}
5	Bedrock	---	40°	1,500	130	1.0×10^{-7}

Seismic Hazards – Landslides

There are currently no significant slopes or other topographic features at the Project site that appear susceptible to slope failure. The California Geologic Survey has produced a series of landslide inventory and landslide hazard maps for unstable areas of the State. The Project site and the vicinity are not mapped as having pre-existing or future slope stability hazards.

Slope Stability – Material Properties

Available subsurface information at the site consists of six borings B-1 through B-6, performed by BSK Associates in November 2011 (BSK Associates Engineering & Laboratories, 2011). These borings provide descriptions of the subsurface strata, which have been generalized into five strata as described below and used in the slope stability modeling.

Moist Sand

In the available borings, this light colored, moist, sand layer generally exists from the ground surface down to depths ranging from 7- to 15-feet bgs. It has a typical thickness of 12-feet. It is expected to have little to no cohesion and is expected to be medium-dense. The bottom of this layer is at or slightly above the groundwater levels noted in the borings. In the slope stability analysis material layers as depicted in the output figures (slope stability profiles) provided in Appendix F.

Wet Sand, Gravel, Cobbles

This is a water-bearing layer of olive-gray colored sand, gravel, cobbles, with an approximate thickness ranging from 15- to 25-feet. In the easterly portion of the site (Borings B-3, B-4, B-5, B-6), groundwater was noted at the top of or close to the top of this strata. In the easterly portion of the site (Borings B-1 and B-2), groundwater is noted to gradually dip to the mid-depth or slightly below the mid-depth of this layer. This stratum is also expected to have little or no cohesion, but with higher friction angles than the sandy layer above it, due to the presence of gravel and cobbles.

Wet Clayey Sand, Grave, Cobbles

The top of this yellow-brown to olive-brown, wet, clayey sand, gravel, cobble layer is generally at approximate elevation 430-feet mean sea level (MSL) (Borings B-1 through B-5). It rises to approximate elevation 440 feet MSL near the east end of the site (Boring B-6). The thickness of this layer is of the order of 20- to 50-feet, generally increasing to the west, as the underlying bedrock and the dense soil mantle over the bedrock dip down to the west. This layer is expected to have both cohesion due to its clay content, and relatively high friction angle due to its sand, gravel, and cobble components.

Dense Silty Clayey Sand

This layer consists of mixtures of gray, olive-gray, bluish-gray, olive-brown colored silty clayey sand. It is described as moist to dry, indicating that it is a 'tight' formation since it is dry despite being below groundwater. In some zones, the boring logs note hard to very hard drilling. This layer is expected to have a higher strength, with properties of a stiffer cohesive material intermixed with frictional material. This layer generally tends to follow the bedrock surface as a mantle with thickness of 20-feet or more. Towards the west end of the site, bedrock was not encountered at a depth of 90-feet. The thickness of this layer may increase towards the west.

Granitic Bedrock

Dry, granitic bedrock was encountered at its shallowest, at elevation 400-feet MSL or 67-feet bgs in the easterly quadrant of the site (B-4). Based on an approximate extension of the bedrock surface profile to the west, the top of bedrock can be estimated to be in the range of 340- to 360-feet MSL, or 100- to 120-feet bgs, under the westerly portions of the site. Borings B-1 and B-2 in this area did not encounter bedrock withing their maximum exploration depths of 90-feet bgs. For slope stability modeling purposes, bedrock has been assigned a very high strength and is not considered to be an influencing factor in the stability calculations.

Slope Stability – Manmade Material Properties

The man-placed materials related to the analysis include the following.

Slurry Wall

It is expected that the slurry wall would be a low-permeability barrier consisting of either a soil-bentonite mix or a soil-cement-bentonite mix, depending on the design details. Two types of walls have been

conceptually evaluated in the analysis: one with an approximate equivalent cohesion value of 400 psf, referred to as the "low strength wall; and another with an approximate equivalent cohesion value of about 2,000 psf, referred to as the 'moderate strength wall". In practice, an increase in the shear resistance values for the slurry wall would be achieved by adjusting the cement content of the slurry mix.

Compacted Fill

Fill would be used to create the 3H to 1V (horizontal:vertical) reservoir slope. It is expected to consist of excavated on-site materials which would likely be a blend of granular and fine materials obtained from the pit. For stability purposes, the excavation slope would be benched and the fill material would be placed against the slope in horizontal lifts.

Summary – Material Properties

The material parameters relevant to the slope stability analysis are listed in Table 3.7-4.

Laboratory test data is not available but presumed soil strength parameters can reasonably be assigned based on the available descriptions and professional judgement. The values assigned to each generalized strata as well as the future backfill and slurry wall materials are as summarized in Table 3.7-4. The permeability values listed in Table 3.7-4 are the same as those used in the Hydrology Study (SLR, 2021).

During design, additional geotechnical investigations and laboratory testing would be performed to confirm or modify these parameters as appropriate.

Table 3.7-4. Material Properties for Slope Stability Analysis

Material	Unit Weight γ (lbs/ft^3)	Cohesion c (psf)	Friction Angle Φ (°)	Permeability (ft/s)
Sand (SP)	115	0	35	5E-05 (1.5E-3)
Sand, Gravel, Cobbles (GP)	125	0	38	7E-04 (2E-2)
Clayey Sand, Gravel, Cobbles (SC/SM)	120	200	36	2E-06 (6E-5)
Silty Clayey Sand (SC/CL)	120	400	28	5E-08 (1.5E-6)
Granitic Bedrock	135	"INFINITE" STRENGTH		3E-06 (9E-5)
Slurry Wall	130	varies	0	3E-11 (9E-10)
Compacted Fill	120	200	33	2E-06 (6E-5)

3.7.5.4 Slope Stability Analysis

Slope stability analysis was performed using the Slide2 geotechnical software by RocScience. Slide2 is a two-dimensional limit equilibrium slope stability analysis program for estimating the slope Factor of Safety (FS) by various methods of slices. Circular surfaces were used in the analyses to identify the critical failure surface having the lowest FS for each assumed scenario.

Excavation Slope Stability

This portion of the evaluation pertains only to the excavation conditions until permanent reservoir slopes are constructed at a shallower gradient. Throughout the duration of excavation, dewatering systems would be in place to allow safe operation inside the pit. This requires a dewatering system capable of maintaining the groundwater water levels at or below the lowest excavation level in the pit, as excavation progresses. This would be accomplished by the combination of the perimeter slurry wall outside and interior dewatering systems inside the pit, such as pumps, sumps, and trenches. The critical slope condition would be at the maximum excavation depth.

The desired excavation slopes would generally be targeted to achieve the steepest safe gradient. For most applications, this would be in the range of 1.5H:1V to 1H:1V. Depending on site-specific conditions and the localized variations in the exposed conditions, various measures are then implemented as excavation proceeds. Some of these measures may include varying the slope gradients, using benches, providing additional drainage and dewatering systems, and if needed, installing additional structural support systems.

The analysis aimed to evaluate the feasibility of the project based on the soil parameters summarized in Section 3.7.5.3, without relying on additional stabilizing measures such as benches. Further evaluation and verification of these parameters would be undertaken during design and additional safeguards would be implemented during construction to address the specific conditions.

A generally acceptable factor of safety (FS) value for temporary excavation slopes is of the order of 1.25. For relatively longer temporary excavation durations involved here, an additional margin may be desirable, though not mandated.

Dewatering Scenarios

For the fully excavated condition, the groundwater levels between the toe of the excavation slopes and front of the slurry wall system would depend on the type and location of the dewatering systems to be used, as well as the slurry wall properties, the permeability of the materials beneath the slurry wall, and the base of the excavation. The assumed permeability values based on generalized subsurface material types are as provided in Table 3.7-4. The slurry wall configuration is as shown in the various slope stability outputs. During design and construction, further details and verification would take place.

For our evaluation, the dewatering system effectiveness between the toe of slope and the slurry wall has been assumed in three categories. In all cases, the dewatering would have to bring the groundwater levels to no higher than the toe of slope. For groundwater levels projected under the slope, three different conditions have been presumed. These are shown in the output figures of Attachment C of the Geology and Soils Report (Appendix F), as part of the different slope stability analysis scenarios. From a typical construction practice point of view, these three dewatering levels may consist of the following methods:

- **Dewatering by Wells:** Groundwater assumed at or below the bottom of the excavation level between the toe of slope and the front of the slurry wall;

- **Dewatering by Continuous Trenches at the Base and Perimeter of the Excavation:** Groundwater assumed to rise from the toe of slope to + 10 feet at the front face of the slurry wall; and
- **Dewatering by Intermittent Sumps:** Groundwater assumed to rise from the toe of slope to + 20 feet at the front face of the slurry wall.

The nomenclature used here for differing categories of dewatering aggressiveness is only intended as a descriptive tool, it does not imply the application of a specific dewatering system. The suitability and the details of any dewatering system would be developed during design and construction.

Slope Gradient Scenarios

For each of these three dewatering categories, three different slope gradients have been evaluated, for a total of nine (9) scenarios. The results of these scenarios are briefly described in the sections below and summarized in Table 3.7-5.

- **1.5H:1V Slope:** The estimated FS for an excavation slope of 1.5H:1V is satisfactory for each of the dewatering scenarios considered. The FS values range from 1.4 (with trench or sump dewatering) to 1.5 (with well dewatering). A 1H:1V slope gradient provides an additional margin above the minimum 1.25 FS value for each of the scenarios analyzed.
- **1.25H:1V Slope:** The estimated FS for an excavation slope of 1.25H:1V is adequate with trench or sump dewatering. An added margin can be achieved if a more aggressive dewatering well system is used. It may be possible to achieve higher FS values with this slope with other dewatering methods, depending on the results of further explorations, additional field and laboratory tests, and refinements that can be made during design and construction.
- **1H:1V Slope:** The estimated FS values for an excavation slope of 1H:1V range from 1.1 (with sump dewatering) to 1.2 (with trench or well dewatering). These findings may vary depending on the results of further studies. Unless additional studies indicate otherwise, a 1H:1V excavation gradient is not considered to be suitable under the current assumptions.

Summary of Excavation Slope Stability Scenarios

The estimated FS for different excavation slope scenarios is summarized in Table 3.7-5.

Table 3.7-5. Estimated Factor of Safety for Different Excavation Scenarios

Excavation Slope Gradient	Condition Analyzed		
	Excavation dewatered from toe of slope to slurry wall	Excavation dewatered from toe of slope to +10 feet at slurry wall	Excavation dewatered from toe of slope to +20 feet at slurry wall
1.5H:1V (33°)	1.5	1.4	1.4
1.25H:1V (39°)	1.4	1.3	1.3
1H:1V (45°)	1.2	1.2	1.1

Reservoir Slope Stability

Upon completion of excavation, the cut slopes would be backfilled to a permanent gradient of 3H:1V to use the facility as a reservoir. The reservoir would be subject to various cycles of filling and emptying. The results of the slope stability analysis for this long-term use condition are summarized in Table 3.7-6.

The analysis for reservoir slopes includes steady state, rapid drawdown, and seismic (pseudostatic) conditions. A commonly used dynamic slope stability analysis method is pseudostatic analysis. This method applies a simulated equivalent acceleration acting on the mass of a potential slide mass, using limit equilibrium analysis methods. The ground motion parameter used in a Pseudostatic analysis is referred to as the seismic coefficient "k", which is different than the peak ground acceleration values.

Steady State: Steady state seepage conditions were incorporated in the model using the groundwater boundary conditions for the final configuration, using the estimated hydraulic conductivities of subsurface layers and the properties of the slurry wall cutoff system.

Rapid Drawdown: The rapid drawdown conditions are applicable when the reservoir is emptied. Emptying the reservoirs is expected to occur over approximately 2 weeks which would allow some of the water pressure in the slope to dissipate. However, the analyses performed conservatively assumed no pressure dissipation, which is an extreme worst-case condition.

Pseudostatic: Seismic slope stability has been evaluated by considering an equivalent horizontal ground acceleration corresponding to a pseudostatic seismic coefficient of 0.1.

Table 3.7-6. Estimated Factor of Safety for Different Reservoir Conditions

3H:1V Backfill Placed Over	Condition Analyzed		
	Steady State	Rapid Drawdown	Pseudostatic
1.5H:1V (33°)	1.6	1.3	1.1
1.25H:1V (39°)	1.6	1.3	1.1
1H:1V (45°)	1.5	1.3	1.1

The slope stability FS values for each of the permanent condition scenarios are all within their respective acceptable FS values. The rapid drawdown FS value reflects a conservative assumption and actual conditions would likely be higher. There is no significant difference in FS values for a 3H:1V slope placed on different excavation slope gradients. This is as expected since the overall stability of the permanent slope is largely governed by the wedge of compacted fill placed over the temporary excavation slopes.

Slurry Wall Stability Analysis

The finite element analysis method aimed to assess the displacements which would develop in the slurry wall as the strength and stiffness parameters of the wall were varied over an expected range that can be achieved. Analysis was carried out using the finite element modelling software RS2, developed by Rocscience. RS2 is a 2D finite element program for soil and rock applications, with the ability to carry out slope stability analysis using the shear strength reduction method.

The developed slope model was meshed using a graded mesh with 6-noded triangles. The boundaries were fixed both in the x and y plane. Groundwater was set at a total head condition of 5-feet bgs. The typical model configuration and output graphics are provided in Appendix F.

The limit equilibrium method such as that used in the slope stability analysis, evaluates the different failure conditions of the slope system, but does not provide information on ground movements within the system. On the other hand, the fine element model evaluates the ground deformations within the system.

The FS value in limit equilibrium is based on the ratio of resisting forces in relation to the sliding forces. In the finite element method, an equivalent FS is obtained by reducing the soil strength until the deformations become excessive and the computation becomes unstable (failure). The ratio of actual soil strength in relation to the reduced strength for failure is called the Strength Reduction Factor (SRF). The FRS and FS values for a given slope would be similar, but not necessarily identical.

The basic soil strength parameters are as established for the slope stability analysis (Table 3.7-4). These values were supplemented with elastic properties corresponding to each layer. The expanded soil material properties are as summarized in the Geology and Soils Technical Study located in Appendix F.

Slurry Wall Stability for Excavation

In the Finite Element Model (FEM) scenarios studied, the slurry wall and the slope have the same layout as in the slope stability analysis above. The analyses were conducted for a 3-foot-wide slurry wall, located behind the top of the excavated slope. A slope of 1.5H:1V was applied to all Excavation scenarios since this is the most realistic case. To be conservative, the total excavation depth for all scenarios is 76-feet bgs (the reservoir is anticipated to be 70 feet bgs).

The excavation progress in front of the slurry wall was modeled for the interim stages of excavation. The models were staged to simulate the excavation in approximate depth increments of 3.8-feet, representing a typical annual production rate, to reach the total excavation depth of 76-feet in 20 years.

Outputs from the RS2 finite element model for the various scenarios discussed here are provided in Geology and Soils Technical Study.

For each scenario, the deflections of the slurry wall were estimated as provided in the Geology and Soils Technical Report located in Appendix F. The strength reduction method was applied to obtain the critical Strength Reduction Factor (SRF, FS) for each slurry wall strength scenario at the full excavation stage. A summary of the results for the four scenarios are provided in Table 3.7-7.

Table 3.7-7. Summary of FEM Results for Different Slurry Wall Scenarios

Scenario	Estimated Max. Displacement (inches)	Estimated annual Displacement (inches)	SRF (FS)
Low Strength Slurry Wall (400 psf)	5.2	0.3	1.20
Moderate Strength Slurry Wall (2 ksf)	3.8	0.2	1.26

Slurry Wall Stability for Reservoir

A finite element model analysis was performed for the case of the slurry wall behind the permanent 3H:1V slope of the reservoir. The input for our analysis is based on the geotechnical characteristics of the materials in the excavation area, that are assessed from available boring logs.

For the conditions analyzed, the slurry wall extends from the ground surface behind the top of the outer slope, down to approximately 10-feet below the bottom of the Reservoir, into the low permeability native materials.

For the completed reservoir with 3H:1V slopes and empty condition, which is more critical for slope stability, the calculated FS exceeds the generally accepted value of 1.5.

For rapid drawdown conditions which represents emptying of the reservoir without allowing adequate time for dissipation of water from the soil within the slope, the FS exceeds the generally accepted values which range from 1.25 to 1.40.

For pseudostatic (seismic) conditions, the FS exceeds the generally accepted value of 1.1.

Results show that the proposed slopes are sufficiently stable, including during earthquake conditions. The slope and slurry wall deformation analyses that demonstrate that the slopes and slurry wall deformations would be tolerable with adequate safety.

Further analysis during design will establish a suitable slurry wall mix design to provide the desired performance of the system.

The key design aspects of the slurry wall are the mix designs for both the bentonite slurry that is used to support the trench during excavation and for the backfill soil-bentonite mixture that forms the slurry wall. The details of these mixes would be established during the detailed design process discussed below and would incorporate the following essential design bases and criteria.

- The bentonite slurry mix, which is predominantly a bentonite-water mixture is designed to have sufficient viscosity and density to support the trench walls during excavation.

- The soil-bentonite backfill mix is designed to have a low permeability, be sufficiently ductile to adjust to deformations in the excavation slopes, and to resist the hydraulic pressures that will develop behind the wall as the Excavation is dewatered or the Reservoir is emptied.
- A key parameter in the design is to ensure the grain size of the soil materials are sufficiently large so that the water pressure cannot force them to migrate through the adjacent natural soils to prevent what is known as "piping". Use of a soil-cement-bentonite mix could further improve the resistance to piping.

These types of walls are frequently constructed and therefore there is a sound basis for assessing appropriate mix designs that will meet the above requirements.

3.7.5.5 Paleontological Resources and Unique Geological Features

Applied EarthWorks completed the original Paleontological Resources Assessment (PRA) for the Project in 2014 and updated the study in 2021. The 2021 Addendum to the 2014 PRA addresses the updated Project plans through a new museum records search, comprehensive literature and geologic map reviews, and pedestrian survey. Using the results of museum records search and literature review, Applied EarthWorks determined the paleontological resource potential of the Project in accordance with Society of Vertebrate Paleontology guidelines. The report summarizes the methods and results of the PRA and provides Project-specific management recommendations.

Published geologic maps indicate the late Pleistocene Modesto Formation and underlying middle Pleistocene Riverbank Formation occur within the Project area (a radius of approximately 43 miles from Project site). Online museum and database records indicate numerous fossil specimens representing plants, mammals, reptiles, and birds from within the Modesto and Riverbank Formations throughout the San Joaquin Valley. These include at least 14 vertebrate fossil specimens from 12 localities within unnamed Pleistocene deposits in Tulare County. Records search results indicate three vertebrate fossil localities yielding *Mammuthus* (mammoth) and *Equus* (horse) within sediments in Tulare County consistent with the Modesto and Riverbank Formations. However, no previously recorded paleontological localities were found within Project site.

Applied EarthWorks paleontology field monitor completed a pedestrian field survey of the Project site and adjacent property on January 12, 2021, to confirm the presence/absence of exposed fossils on the ground surface and to evaluate geologic exposures for their potential to yield subsurface fossil material. There was no recording of any new fossil localities during the survey.

As a result of this study, Applied EarthWorks concluded that there was the potential for paleontological resource at the Project site because the fossiliferous Modesto and Riverbank Formations mapped in the Project area. Significant and intact fossils have been recorded in these geologic units in the Project area and elsewhere in the San Joaquin Valley. Recent fluvial sediments overlying these geologic formations and visible at the present ground surface have low paleontological sensitivity. Therefore, Applied EarthWorks

felt that paleontological sensitivity increases with depth within the Project area (within a 43-mile radius of the Project site).

Undisturbed geologic units with a proven potential to yield paleontological resources occur at shallow depths in the Project area. Therefore, there is a potential for impacting fossils during ground-disturbing construction activities. Applied EarthWorks recommended paleontological resource mitigation monitoring during the excavation of the Project site. Applied EarthWorks also suggested that a Paleontological Resource Mitigation and Monitoring Program be prepared for the Project, including, but not limited to, a preconstruction Worker's Environmental Awareness Training module. By implementing these mitigation measures during Project development, adverse impacts to paleontological resources can be reduced to a less than significant level.

3.7.5.6 Project Design Features and Environmental Protection Measures

Numerous design features, BMPs, operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The following identifies some of the environmental protective measures that were considered during this evaluation:

- The Project site would be designed to comply with the best management practices (BMPs) identified in the site-specific Storm Water Pollution Prevention Plan (SWPPP).
- The Project site would be graded to prevent sediment from leaving the site.
- BMPs (e.g., gravel bag or rock check dams along drainage swales, silt fencing or fiber rolls to contain drainage and sediment, lined swales, etc.) would be implemented to prevent stormwater runoff in accordance with the SWPPP.
- Equipment and vehicle parking/storage areas would be either graded to prevent stormwater from leaving the site or located within the pit.
- Excavation equipment would be inspected, maintained and repaired to ensure that the equipment is operating properly, and leaks are prevented to the maximum extent feasible.
- Minor/routine maintenance and fueling activities conducted on-site would be done in accordance with the BMPs identified in the SWPPP.
- Hazardous materials and hazardous waste would be managed in accordance with applicable local, state and federal regulations. Any hazardous waste generated at the site would be disposed of at a permitted off-site facility.
- Exposed slopes within the reservoir basin above the anticipated water line would be stabilized using riprap or would be protected by other equally effective means, if necessary, to prevent water and wind erosion.
- The design slope configurations were evaluated under both static and pseudo-static conditions, and would be stable according to appropriate factors of safety.

3.7.6 Project-Level Impacts and Mitigation Measures

3.7.6.7 Seismic and Seismic Related Hazards

Impact Statement

Impact GEO-1**:** *Would the Project directly or indirectly cause potential substantial adverse effects, involving the risk of loss, injury, or death involving*: **(CEQA Guidelines Threshold Criteria (a))**

a.i *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zone Map issued by the State Geologist for the area or based on other substantial evidence of known fault. Refer to Division of Mines and Geology Special Publication 42;*

a.ii *Strong seismic ground shaking;*

a.iii *Seismic-related ground failure, including liquefaction; or*

a.iv *Landslides?*

Impact Analysis

The majority of Tulare County is free of the faults noted on the Alquist-Priolo Earthquake Fault Zoning Map. Such faulting is noted only along the eastern-most boundary with Inyo County. As such, there is no known active earthquake fault in or within 30 miles of the Project site. Risks associated with different manifestations of seismic hazards are addressed below.

Seismic Hazards – Surface Fault Rupture (criteria a.i)

Earthquake surface rupture is the physical displacement of surface deposits, either laterally or vertically, along a fault trace. Surface rupture is the surface expression of the subsurface fault movement and generally only occurs along or within a few hundred feet of the fault trace that moves during an earthquake. Not all large earthquakes have a surface expression or co-seismic surface rupture (e.g., blind thrust faulting associated with the 1994 Northridge, MW6.7 earthquake).

The Project is in Tulare County, which is not a designated Alquist-Priolo Earthquake Zone (APEZ) as issued in Special Publication 42 by the California Geological Survey (2007). Geographic areas are designed as APEZ if they encompass potentially active or recently-active faults.

A review of the 2014 fault activity map for California indicates that no active faults cross the Project site. Refer to and Figure 3.7-2. The closest faults to the Project site are all located at least 35 miles from the site. Because the Project site is not located within or near an APEZ, there is little potential for the occurrence of surface fault rupture. As a result, the Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving major geological hazards. Therefore, the Project would result in Less than Significant Impacts.

Table 3.7-8. Active or Potentially Active Faults within 75 Miles of the Project Site

Fault Zone	Approximate Distance (Miles)
Independence	48
Birch Creek	56
Great Valley (Segment 14)	56
Owens Valley	56
South Sierra Nevada	60
Great Valley (Segment 13)	62
Round Valley	63
White Mountains	65
Hunter Mountain Connected	69
Little Lake	73
Great Valley (Segment 12)	73

Source: USGS (http://earthquake.usgs.gov/hazards/qfaults/)

Seismic Hazards – Strong Seismic Ground Shaking (criteria a.ii)

Ground Shaking Intensity: The estimated ground shaking (acceleration) at the Project site does not pose a potentially significant impact because Project's proposed design accounts for the estimated ground acceleration and therefore ground shaking is expected to pose a less than significant impact. The proposed slopes into the quarry are at an inclination of 3H:1V (horizontal to vertical) corresponding to an angle of 18.5 degrees. The materials at the site range from silty sand to sandy gravel with shear resistance characterized by friction angles which, for that type of material, ranges from 30 to 38 degrees. Stability analyses were carried out for these conditions and the applicable pseudostatic coefficient. The calculated FS values as discussed in Section 3.7.5.4, meet the necessary stability criteria. Therefore, the Project would result in less than significant impacts.

Ground Shaking Induced Seiche: Seismic events can create hazards with their impact on water bodies. One such phenomenon is Tsunami, which would not apply here since the Project site is not near the coast. A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes as a result of ground shaking. The wave can reduce water levels at one end of the water body and increase the water level on the other, similar to the "sloshing" of water back and forth.

The risk of seiche developing in the proposed reservoir as a result of ground shaking during an earthquake has been evaluated and the results indicate this to be unlikely.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave.

The natural period of the reservoir can be calculated using the Merian formula assuming a rectangular basin (USNRC, 2011):

$$\mathrm{T} = \frac{2\,L}{\sqrt{gh}}$$

Where L is the length of the basin, g the acceleration of gravity (32.2 cm/sec^2), and h the depth of water. Combining a representative value of 600-feet as the average width of the basin and a depth of water h of 70-feet, the natural period of the reservoir is estimated to be:

$$T = \frac{(2)(600)}{\sqrt{(32.2)(70)}} = 25\ s$$

This natural period is to be compared to that of the earthquake that may shake the site. The typical range of period for strong ground motion is between 0 and 5.0 seconds, with the dominant period for the site-specific event being on the order of 0.2 second (USGS, http://geohazards.usgs.gov/hazardtool/application.php). Therefore, the difference in period between the reservoir and the design earthquake is two orders of magnitude.

An empirical formula is provided in HAZUS (FEMA, 2003) to estimate the peak wave height of the seiche as:

$$H = \sqrt{\frac{A}{L\,(\pi f)^2}}$$

Where H is peak height, A the acceleration in, g's, f the frequency of the lake, and L the wavelength (5.12/ft^2). Using the PGA calculated for the 2,475-year event of 0.20 g, the maximum wave height a seiche is estimated to be 0.06 cm.

The estimated value of the peak wave for the seiche at the site is extremely low and for practical purposes, insignificant. In addition, the ratio between the reservoir and the natural period of the seismic event that could occur on site indicates that a possible resonance condition is unlikely. Therefore, the Project would result in less than significant impacts.

Seismic Hazards – Ground Failure and Liquefaction, Lateral Spreading (criteria a.iii)

Settlement of the ground surface (i.e., ground failure) can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid compaction and settling of subsurface materials (particularly loose, uncompacted, and variable sandy sediments above the water table) due to the rearrangement of soil particles during prolonged ground-shaking. Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different amounts). Areas underlain by artificial fill are particularly susceptible to this type of settlement. Given the geologic setting of the Project site, the fluvial nature of sediment deposition and the absence of fill,

seismically-induced ground failure is not a significant hazard. Therefore, the Project is expected to result in less than significant impacts.

Soil liquefaction is a condition in which saturated granular soils undergo a substantial loss of strength and deformation due to increased pore pressure, resulting from cyclic stress application induced by earthquakes. During liquefaction, the soil becomes sufficiently mobile to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are sand deposits that are saturated, loose, clean, uniformly-graded, and fine-grained. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo differential settlement. This would result in reduction of foundation stiffness and capacity. When this occurs, the structure can settle, tip, or even become buoyant and shift upwards. Liquefaction and associated ground failures could damage foundations, roads, underground cables and pipelines, and disrupt utility service.

Earthquake induced liquefaction typically occurs within the top 50-feet of liquefaction-prone soil, if those soils are saturated. A review of the logs associated with borings advanced at the Project site (BSK Associates Engineering & Laboratories, 2011) indicates that the water table is at an average depth of 15-feet below grade (refer to Attachment C of Appendix F – *Geology and Soils Technical Study*). The saturated soils below that depth are classified as silty sand to poorly-graded sandy silt and cobbles, as is illustrated in Table 3.7-9. The sieve analyses on the samples recovered at depth greater than 15-feet indicate silt contents on the order of 10 percent. Whereas these materials may generally be considered liquefiable, the presence of at least 10 percent of fines in the sand reduces the liquefaction potential of the sand. The depth of groundwater, combined with the anticipated level of ground shaking, means that the potential for liquefaction at the Project site is low. As such, the Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving major geological hazards. Therefore, the Project would result in less than significant impacts.

Table 3.7-9. Representative Soils Cross-Section at McKay Reservoir Project Site

Layer	Description	Thickness (feet)	Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)	Hydraulic Conductivity (cm/s)
1	Poorly graded sand	13	36°	0	110	1.6×10^{-3}
2	Poorly graded sandy gravel	15	35°	0	120	2.25×10^{-3}
3	Silty clayey sand	42	33°	0	110	1.0×10^{-6}
4	Silty clay/low plasticity clay	25	28°	200	105	1.0×10^{-7}
5	Bedrock	-	40°	1,500	130	1.0×10^{-7}

Seismic Hazards – Landslides (criteria a.iv)

Slope stability at the Project site does not currently present a significant landslide hazard. There are currently no significant slopes or other topographic features at the Project site that appear susceptible to slope failure. The California Geologic Survey has produced a series of landslide inventory and landslide

hazard maps for unstable areas of the State. The Project site and the vicinity are not mapped as having pre-existing or future slope stability hazards. As such, the Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving major geological hazards. Therefore, the Project would result in less than significant impacts.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.7.6.8 Soil Erosion or Loss of Topsoil

Impact Statement

Impact GEO-2**:** *Would the Project result in substantial soil erosion or the loss of topsoil?* **(CEQA Guidelines Threshold Criteria (b))**

Impact Analysis

Erosion is the removal of soils and rocks due to natural process, such as flow of water and wind. Erosion is expected to occur within the Project site as a result of excavation, but not at the ground surface outside the Project perimeter. The Project incorporates design considerations and practices to reduce the potential for, and impacts of erosion. These are discussed in detail in the Reclamation Plan and SWPPP and include Best Management Practices (BMPs) such as sediment catchment basins, berms, rock dams, and energy dissipaters.

Vegetation and topsoil would be removed during the initial site preparation and excavation of the Project site. If feasible, topsoil would be stockpiled for use in reclamation/revegetation. However, because the site would be used as a water reservoir, it may not be feasible to revegetate of the Project site. As a result, impacts due to soil erosion and topsoil loss are considered less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.7.6.9 Ground Instability

Impact Statement

Impact GEO-3**:** *Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?* **(CEQA Guidelines Threshold Criteria (c))**

Impact Analysis

This CEQA criterion seeks to answer if the Project site is located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. The seismically induced risk of ground instability (liquefaction, lateral spreading) was addressed in detail in the Geology and Soils Technical Study located in Appendix F.

The Project is considered feasible and capable of containing such risks by applying proper design and construction practices. Ground instability related to Project activities and evaluation of different ground instability factors are addressed below.

Stability of Existing Ground Conditions: There are no known existing geologic conditions or natural slopes that would impact the stability of existing ground conditions.

Stability of Project Slopes: The Project involves excavation of pit that meets the requirements for the construction of a reservoir. The anticipated depth of the reservoir is approximately 75-feet with slopes out at 3H:1V (horizontal to vertical).

A slurry wall would be installed around the perimeter of the pit. The subsoil conditions at the Site were established based on existing onsite soil boring logs and the grain size analyses performed on samples recovered during the drilling operations (BSK Associates Engineering & Laboratories, 2011). The subsoil conditions generally consist of sand, sandy gravel, and clayey sand with cobbles. For the purpose of the SLR slope stability evaluation, a representative cross-section was developed and slope stability analyses were performed as summarized in Section 3.7.5.4 and discussed in the Geology and Soils Technical Study (Appendix F). Based on the SLR analysis, the Project slopes have adequate FS values and impacts due to ground conditions and instability are considered less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.7.6.10 Potential Impacts Associated with Expansive Soils

Impact Statement

Impact GEO-4: *Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?* **(CEQA Guidelines Threshold Criteria (d))**

Impact Analysis

The soils in the area are predominately classified as granular materials, such as sand, gravel and cobbles, with some silt and occasional clay lenses. None of those soils are subject to expansion when wetted. As such, the Project presents no risk to life or property from expansive soils, resulting in less than significant impacts.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.7.6.11 Potential Impacts Associated with Septic Tanks or Wastewater Disposal

Impact Statement

Impact GEO-5: *Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?* **(CEQA Guidelines Threshold Criteria (e))**

Impact Analysis

The Project would not use septic tanks or alternative wastewater treatment systems. Portable toilets would be provided on site. Impacts associated with septic tanks and/or wastewater disposal would have no impact.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.7.6.12 Paleontology and Unique Geologic Features

Impact Statement

Impact GEO-6: *Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?* **(CEQA Guidelines Threshold Criteria (f))**

Impact Analysis

As discussed in Section 3.7.5.5, undisturbed geologic units with a proven potential to yield paleontological resources occur at shallow depths in the Project area (a radius of approximately 43 miles from the Project site). Therefore, there is a potential for impacting fossils during ground-disturbing excavation and construction activities at depths greater than 5-feet bgs at the Project site. Applied EarthWorks recommended paleontological resource mitigation monitoring during the excavation of the pit. Applied EarthWorks also suggested that a Paleontological Resource Mitigation and Monitoring Program be prepared for the Project, including, but not limited to, a preconstruction Worker's Environmental Awareness Training module. By implementing these mitigation measures during Project development, adverse impacts to paleontological resources can be reduced to a less than significant.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Mitigation Measure GEO-1: *A Paleontological Resource Mitigation and Monitoring Program (PRMMP) will be prepared by a qualified professional. The PRMMP will include the following:*

- *A Worker's Environmental Awareness and Training Program to be implemented prior to the start of excavating the pit.*
- *The PRMMP will indicate where construction monitoring is required for the Project and the frequency of required monitoring including:*
    - *Initial period of spot-checking during the preliminary shallow excavation activities.*
    - *Monitoring at depths below 5 feet.*

- *The PRMMP will describe the different reporting standards to be used—monitoring with negative findings versus monitoring resulting in fossil discoveries.*

Level of Significance After Mitigation

Less than significant with mitigation incorporated.

3.7.7 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 identifies the other projects located within the County and the City of Woodlake considered in regards to potential cumulative impacts. As noted in Table 3.0-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with geological, soil or paleontological resources.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to geology and soils.

The geological context for cumulative impacts for soils and geology impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the impact analysis above for each impact threshold, the Project was determined to have either no impact or a less than significant impact. Since the Project would present no significant impacts to geological resources, there would be no cumulative impact in conjunction with the other cumulative projects.

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3.8 GREENHOUSE GASES

3.8.1 Introduction

This DEIR section assesses greenhouse gas (GHG) impacts of the Project. The methodologies used, and the information provided in this section are supported by calculations in the Air Quality, Health Risk, and Climate Change Impact Assessment (AQCCIA) located in Appendix C.

3.8.2 Environmental Setting

Climate change refers to global changes in the average weather of the Earth measured by changes in wind patterns, storms, precipitation, and temperature. While climate change is global in scale, California-specific impacts to the climate may result in a loss of snow-pack, increased risk of large wildfires, and a potential reduction in the quality and quantity of certain agricultural products.

Gases that trap heat in the atmosphere are GHGs, analogous to the way a greenhouse retains heat. Consequently, these GHG emissions are believed to directly affect the global climate.

3.8.2.1 Emissions Inventories

The California Air Resources Board's (CARB's) most recent GHG emission inventory, the 2020 Edition, tracks the emissions of seven GHGs identified in the California Health and Safety Code for years 2000 to 2018. In 2018, total GHG emissions were 425 million metric tons of carbon dioxide equivalent ($MMTCO_2e$), an increase of 1.0 $MMTCO_2e$ compared to 2017. Emissions have decreased since peak levels in 2004. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product [GDP]) is declining, representing a 43% decline since 2000, while the State's gross domestic product (GDP) has grown 59% during this period (Trend Report, 2020, pp. 1-3).

The transportation sector remains the largest source of GHG emissions in the State, accounting for 40% of statewide emissions in 2018. Emissions from the electricity sector have increased slightly in 2018 and account for 15% of the inventory. Emissions from the remaining sectors have remained relatively constant, although emissions from high-global warming potential (GWP) gases have continued to climb as they replace ozone depleting substances banned under the Montreal Protocol (Trend Report, 2020, p. 5).

3.8.3 Regulatory Setting

The accumulation of GHGs in the atmosphere contributes to the regulation of the earth's temperature. Some GHGs can remain in the atmosphere for long periods of time (i.e., long-lived). There are six GHGs recognized under the Kyoto Protocol and have been found by the International Panel on Climate Change (IPCC) to have an effect on global climate change. These are described below. The primary one associated with the Project are Nitrous Oxides (N_2O). Also see the AQCCIA in Appendix C for additional detail.

Each GHG exhibits a different GWP. The mass of emissions of each GHG is multiplied by its GWP to determine the carbon dioxide equivalent (CO_2e) potential for global warming. GWPs have changed over

time by the IPCC which is considered an authority on GHGs and their effects. GHG emissions inventories and plans use GWPs that are an iteration or two behind and the most recent IPCC publication. Characteristics of each GHG and the associated GWP is presented below.

Carbon Dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include burning coal, oil, natural gas, and wood. By definition, CO_2 has a GWP equal to one (1).

Methane (CH_4) is a flammable GHG. A natural source of CH_4 is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH_4, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle. CH_4 has a GWP equal to 28.

Nitrous Oxide (N_2O) is a colorless GHG. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O has a GWP equal to 265.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for chlorofluorocarbons (CFCs). Of all the GHGs, they are one of three groups with the highest global warming potential. HFCs are human made for applications such as air conditioners and refrigerants. HFCs have GWPs that range from 124 (HFC 125a) to 14,300 (HFC 23).

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. PFCs have GWPs that range from 7,390 (PFC 14) to 12,200 (PFC 116).

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection. SF_6 has a GWP equal to 22,800.

3.8.3.1 Federal

To date, there is no federal overarching law specifically related to climate change or the reduction of GHGs. The Environmental Protection Agency (EPA) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA,* 549 US 497 (2007). The Supreme Court found that GHGs are air pollutants covered by the Clean Air Act, and the EPA Endangerment Findings concluded the elements CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 threatened public health for both current and future generations. In 2009, the U.S. EPA published a rule for the mandatory reporting of GHG from sources that in general emit 25,000 metric tons or more of carbon dioxide equivalent per year in the United States.

Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). This collection of comprehensive, nationwide emissions data is intended to provide a better understanding of the sources of GHGs and to guide development of policies and programs to reduce emissions (U.S. EPA, 2013). Additional federal actions have included the implementation of standards for vehicles, biofuel production, and power generation. Federal actions relating to GHG emissions are summarized and provided in the AQCCIA (Appendix C).

3.8.3.2 State

The following tables provide a brief summary of the numerous pieces of legislations, regulations, plans and policies relating to GHG in California. The AQCCIA in Appendix C has additional detail on the California regulatory history and current status.

Table 3.8-1. California Climate Change Legislation

Date	Legislation	Description
September 10, 2018	Senate Bill 100 (De León, Chapter 312, Statues of 2018)	California Renewables Portfolio Standard Program: emissions of greenhouse gases. This bill establishes the 100 Percent Clean Energy Act of 2017 which increases the Renewables Portfolio Standard (RPS) requirement from 50 percent by 2030 to 60 percent, and creates the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.
July 26, 2017	Assembly Bill 617 (Christina Garcia, Chapter 136, Statutes of 2017)	Companion to Cap-and-Trade Extension Establishes a groundbreaking program to measure and reduce air pollution from mobile and stationary sources at the neighborhood level in the communities most impacted by air pollutants. Requires the Air Resources Board to work closely with local air districts and communities to establish neighborhood air quality monitoring networks and to develop and implement plans to reduce emissions. The focus on community-based air monitoring and emission reductions will provide a national model for enhanced community protection.
July 25, 2017	Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017)	Cap-and-Trade Extension Extends and improves the Cap-and-Trade Program, which will enable the state to meet its 2030 emission reduction goals in the most cost-effective manner. Furthermore, extending the Cap-and-Trade Program will provide billions of dollars in auction proceeds to invest in communities across California.
September 19, 2016	Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)	Short-lived Climate Pollutants Establishes statewide reduction targets for short-lived climate pollutants.

Date	Legislation	Description
September 8, 2016	Assembly Bill 197 (Eduardo Garcia, Chapter 250, Statutes of 2016)	Greenhouse gas regulations Prioritizes direct emission reductions from large stationary sources and mobile sources.
September 8, 2016	Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)	Greenhouse Gas emission reduction target for 2030 Establishes a statewide greenhouse gas (GHG) emission reduction target of 40 percent below 1990 levels by 2030.

Source: California Air Quality and Climate Legislation | California Air Resources Board.

Table 3.8-2. California Climate Change Regulations

Regulation	Description
AB 32 Climate Change Scoping Plan	In June 2021, CARB began holding a Public Workshop Series to commence development of the 2022 Scoping Plan. The 2022 Scoping Plan Update will assess progress towards achieving the SB 32 2030 target of a 40% GHG reduction and lay out a path to achieve carbon neutrality by 2045.
Greenhouse Gas Reduction Fund	State program allocating proceeds from cap-and-trade auctions to support investments and projects that reduce greenhouse gas emissions throughout California.
Amendments to the Mandatory Greenhouse Gas Reporting Regulation	The CARB Regulation for the Mandatory Reporting of Greenhouse Gas Emissions was originally approved in 2007 and revised in 2010, 2012, 2013, 2014, 2016 and 2018. Amendments to Mandatory Reporting Requirements (MRR) were approved on March 29, 2019 and became effective on April 1, 2019, for 2019 data. The 2019 amendments were implemented to: • Support California's Cap-and-Trade Regulation to ensure consistency with the calculation of compliance obligations • Ensure that reported GHG emissions and product data are accurate and complete in order to support California's GHG reduction programs
Cap & Trade Amendments	December 2018 amendments to the cap-and-trade regulation included: • New price containment points and a price ceiling • Limits on offset use • New industrial facility leakage assistance factors for 2018 and beyond • Clarifications on electric and gas utility use of allowance value • Compliance provisions for Energy Imbalance Market (EIM)-related GHG emissions • Offset invalidation clarifications • Streamlining implementation requirements • Adjustments to linkage reflecting Ontario's actions to revoke its participation in the cap-and-trade market. September 2016 amendments to the cap-and-trade regulation included: • Emission caps for the post-2020 program • Post-2020 continuation of the allowance price containment reserve • Linking with Ontario's cap-and-trade program • Compliance with the federal Clean Power Plan • Modifications to allowance allocation

Regulation	Description
Cap & Trade Offset Protocols	The Air Resources Board has adopted five protocols for offset compliance projects. In addition to the original four protocols adopted in 2011, ARB has adopted: Mine Methane Capture (MMC) Projects Compliance Offset Protocol, adopted April 2014
Cap & Trade Link with Quebec	California linked its cap-and-trade program with Quebec's program in January 2014. Linkage allows for the use of compliance instruments from Quebec's greenhouse gas emission trading system to meet compliance obligations pursuant to the California Cap-and-Trade Regulation, and the reciprocal approval of compliance instruments issued by California to meet compliance obligations in the external trading program.
Mandatory Commercial Recycling	This regulation addresses recycling requirements for businesses that generate 4 or more cubic yards of commercial solid waste per week and multifamily residential dwellings with 5 or more units, regardless of the amount of waste generated; local jurisdiction requirements for education, outreach, monitoring and reporting; and CalAsphalt and concrete recycling review. The regulations were approved on May 7, 2012.

Source: (Climate Change | California Air Resources Board, 2021).

On December 14, 2017, CARB approved the 2017 Climate Change Scoping Plan Update (Scoping Plan) which aims to reduce GHG emissions. The Scoping Plan "is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state. Every sector, every local government, every region, every resident is part of the solution. The Scoping Plan underscores that there is no single solution but rather a balanced mix of strategies to achieve the GHG target. This Plan highlights the fact that a balanced mix of strategies provides California with the greatest level of certainty in meeting the target at a low cost while also improving public health, investing in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs and energy diversity. Successful implementation of this Plan relies, in part, on long-term funding plans to inform future appropriations necessary to achieve California's long-term targets." (2017 Scoping Plan, p. ES4).

3.8.3.3 Local

San Joaquin Valley Unified Air Pollution Control District

SJVAPCD GHG policy is established in the *District Policy Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency* (SJVAPCD, 2009). The document outlines a methodology to determine if a project meets the Best Performance Standards (BPS) for GHG emissions. The document states, "Projects implementing BPS would be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions". When serving as the lead agency, the SJVAPCD requires stationary sources that do not comport with a BPS to demonstrate GHG reductions of 29% as compared to Business-as-Usual (BAU). Business-as-Usual is defined by the SJVAPCD as "The emissions for a type of equipment or operation within an identified class and category projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period".

This policy, however, does not apply to the Project; CARB regulations adopted in 2010 established a cap-and-trade program for the largest sources of GHG emissions in the State. Included in cap-and-trade are the fuels that are utilized by the Project.

As discussed in Section 3.3.4.2 south Coast Air Quality Management District (SCAQMD) guidelines, which are more recent than the SJVAPCD guidelines, were used to evaluate significance of GHG impacts. Specifically, SCAQMD excludes emissions from sectors that are required to participate in the Cap-and-Trade Program administered by the California Air Resources Board (CARB) as discussed in the *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Project* (SCAQMD, 12/12/2014).[1] This approach takes into account the cumulative nature of the energy industry and recognizes that consumers of electricity and diesel fuel are in effect regulated by the higher level emissions restrictions on the producers of these energy sources. Energy and fuel suppliers are required to report emissions under the Cap-and-Trade which is designed to reduce GHG emissions as needed to achieve emissions reductions described in related planning documents which primarily consists of the Assembly Bill (AB) 32 Scoping Plan.

Tulare County

The Tulare CAP (Tulare County, 2012a) serves as a guiding document for County actions to reduce GHG emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update.

The Tulare County Climate Action Plan (CAP) (Tulare County, 2012a) serves as a guiding document for County actions to reduce GHG emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update.

General Plan 2030

The Tulare County General Plan (Tulare County, 2012b) policies that relate to greenhouse gas emissions from the proposed Project are listed below.

AQ-1.5 California Environmental Quality Act (CEQA) Compliance

The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonably mitigated when feasible.

AQ-1.7 Support statewide Climate Change Solutions

The County shall monitor and support the efforts of CalEPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code §38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

[1] http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2014

AQ-1.8 Greenhouse Gas Emissions Reduction Plan/Climate Action Plan

The County will develop a Greenhouse Gas Emissions Reduction Plan (Plan) that identifies greenhouse gas emissions within the County as well as ways to reduce those emissions. The Plan will incorporate the requirements adopted by the California Air Resources Board specific to this issue. In addition, the County will work with the Tulare County Association of Governments and other applicable agencies to include the following key items in the regional planning efforts.

1. Inventory all known, or reasonably discoverable, sources of greenhouse gases in the County,
2. Inventory the greenhouse gas emissions in the most current year available, and those projected for year 2020, and
3. Set a target for the reduction of emissions attributable to the County's discretionary land use decisions and its own internal government operations.

AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions

The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.

Climate Action Plan

The Climate Action Plan (CAP) describes itself as follows.

> *…a four-step process recommended by the Institute for Local Government.*
>
> *First, an inventory of greenhouse gas emission sources was developed for a base year (2007) to identify the most important categories and potential for emission reductions.*
>
> *Second, future year inventories for 2020 and 2030 were projected to illustrate what emissions would be in the future accounting for projected growth, but without controls on the sources. The future year inventory is referred to as a "business-as-usual scenario." The year 2020 projection was used to allow comparison to the State's target year in CARB's Scoping Plan. The year 2030 projection was used to identify the growth in emissions that would occur by the General Plan planning horizon year. The 2020 inventory was projected by interpolating emissions growth predicted between 2007 and 2030.*
>
> *The third step was to identify and describe policies, regulations, and programs that apply to sources in the County's emission inventories and will achieve reductions by the target years. The policies, regulations, and programs considered in the CAP include those by federal, state, and local governments. These were then quantified to the extent possible using best available methodologies and data to determine the amount of reductions that are needed by the target years from Tulare County to achieve consistency with state targets.*
>
> *The last step was the development of a monitoring program that tracks implementation progress and emission reductions over time and identifies a process for taking corrective actions, if needed.* (Tulare County, 2012a, pp. 2-3).

The CAP describes the County's, the State's and the SJVAPCD's role in reducing GHGs as follows:

> *The County's focus is on emission sources within its regulatory authority, which are mainly related to land use and the local transportation system. To some extent, the County can influence activities that provide greenhouse gas reductions such as water conservation and solid waste diversion and recycling. The County also can require feasible mitigation measures for new projects as a Lead Agency under the CEQA… new projects are required to address greenhouse gas and climate impacts under CEQA during the approval process.*
>
> *…*
>
> *The CARB has the primary responsibility for the State's climate programs and regulations that would apply to mobile and industrial sources of greenhouse gases. The California Energy Commission has primary responsibility for energy efficiency standards related to buildings and certain consumer products. The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates stationary, areawide, and indirect sources of emissions that impact health. Many SJVAPCD regulations on health-based pollutant emissions also reduce greenhouse gas emissions. (Tulare County, 2012a, p. 3).*

Regarding CEQA, the CAP states:

> *One of the most important uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. Greenhouse gas emissions from an individual project will not result in a perceptible impact on global climate. Impacts to global climate are caused by the cumulative impacts of greenhouse gases emitted anywhere and everywhere on Earth. The Office of Planning and Research CEQA Guidelines encourages use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the policies, implementation measures, and emission reduction targets contained in the CAP would have a less than significant impact on climate change. (Tulare County, 2012a, p. 4).*
>
> *…*
>
> *Although it is technologically possible to reduce greenhouse gases if cost is not considered, the potential exists that a locally implemented measure will only serve to relocate the emissions to another place that does not require the new technology. Therefore, even if emission rates are lower in one place, it could have no effect on global climate if the emission-producing activity is shipped out of State or overseas. (Tulare County, 2012a, p. 4).*
>
> *…*

The CAP operational boundary includes emissions associated with operations owned or controlled by the County. These include direct and indirect emissions resulting from the energy (electricity and natural gas), mobile source (on- and off-road), agriculture (dairy/feedlots), and solid waste (landfills) sectors in

unincorporated Tulare County. Southern California Edison (SCE) is considered within the CAP operational boundary.

Table 3.8-3 presents the list of emissions reductions that the CAP takes credit for in demonstrating consistency with the AB 32 Scoping Plan and objective to reduce GHG emissions to 1990 levels by 2020. The following discussion in the CAP is applicable to the Project. ”*Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will be subject to conditions of approval and mitigation measures that will reduce GHG emissions beyond State regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit GHGs to levels that meet or exceed State targets*.” (Tulare County, 2012a, p. 55).

Table 3.8-3. Emission Reductions from State Regulations and Measures

Affected Emission Sources	California Legislation	Percent Reduction from 2020 GHG Inventory	Fraction Applicable to Tulare Co. Inventory	End Use Sector	Scaled Emission Reduction Credit
Mobile	AB 1493 Pavley	19.7	0.387	On-road passenger/ light truck transportation	7.62
	LCFS	7.2	0.387	On-road passenger/ light truck transportation	2.79
	LCFS	7.2	0.067	On-road Heavy/ Medium Duty transportation	0.48
	Heavy Duty Efficiency	2.9	0.013	On-road Heavy Duty transportation	0.04
	Passenger Vehicle Efficiency	2.8	0.387	On-road passenger/ light truck transportation	1.08
Area	Energy Efficiency Measures	9.5	0.039	Natural Gas (Residential)	0.37
			0.12	Natural Gas (Non-Residential)	1.13
Indirect	Renewable Portfolio Standard	18.3	0.271	Electricity (excluding cogeneration)	4.96
	Energy Efficiency Measures	15.7	0.271	Electricity	4.25
	Solid Waste Methane	14.2	0.106	Solid Waste (10.6)	1.51
	Solar Roofs	1.5	0.271	Electricity (excluding cogeneration) (27.1)	0.41
Total Reductions from Statewide Measures in Tulare County					**24.63**

Source: (Tulare County, 2012a, p. B12).

The following discussion in the CAP is applicable to the Project:

> *"Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will be subject to conditions of approval and mitigation measures that will reduce GHG emissions beyond State regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit GHGs to levels that meet or exceed State targets." (Tulare County, 2012a, p. 55)*

Other measures only applicable to commercial, residential and mixed uses (i.e., not industrial) are presented in the AQCCIA (see Appendix C).

3.8.4 Significance Thresholds

Determination of whether an impact is significant usually involves the comparison of Project impact levels to threshold criteria set by the lead agency. For air quality and GHG impacts, lead agencies often rely on guidance from a responsible agency. In this report, SCAQMD guidance is utilized, as discussed in the AQCCIA (see Appendix C).

3.8.4.1 CEQA Guidelines Appendix G

Appendix G of the CEQA Guidelines presents questions about projects that, if true for a particular project, would be considered a significant impact. This document considers the following Appendix G checklist questions to be the Significance Thresholds for GHG emissions from this Project.

Would the project:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

3.8.4.2 Additional Threshold Criteria

Tulare County

The Tulare County CAP identifies the items in Table 3.8-4 as requirements for determining consistency of a project with the CAP.

Table 3.8-4. CEQA Project Requirements for Consistency with CAP

Item	Required for Consistency?
Percent reduction in greenhouse gas emissions	6%
Consistency with General Plan policies	Yes
Consistency with Rural Valley Land Plans or Foothill Growth Management Plan development criteria	Yes
Consistency with Urban Growth Boundary expansion criteria	Yes

Item	Required for Consistency?
Consistency for development within Rural Community Urban Development Boundaries and Hamlet Development Boundaries	Yes

Source: (Tulare County, 2012a, p. 58)

South Coast Air Quality Management District

This analysis utilizes SCAQMD guidelines because the SCAQMD guidelines are more recent than the SJVAPCD guidelines (see Section 3.8.6.2). With the new cap-and-trade policy, fuels used by the Project are regulated at a higher level, so GHG emissions associated with these fuels are calculated and summarized for disclosure purposes. SCAQMD uses a 10,000 metric ton/year (MT/yr) CO_2e for determining significant impacts for proposed projects (SCQAMD, 2008). The SCAQMD threshold is compared to the Project GHG emissions for context and disclosure.

3.8.5 Methodology of Analysis

As discussed previously, CO_2e emissions associated with off-road mobile equipment were calculated using CalEEMod. The estimated mass of GHGs that would be emitted during construction phase of the Project was determined to be an annual maximum of 96.7 metric tons of CO_2e ($MTCO_2e$) per year based on the activity levels provided by Provost and Pritchard Consulting Group located in the AQCCIA (see Appendix C).

3.8.5.1 Baseline Condition

The baseline condition consists of emissions associated with excavation of materials at the adjacent Seaborn site. The amount of work required to excavate material at each site and for the Project is considered to be equal because of the similar topography of the sites. The amount of work performed in transporting material to the Seaborn processing plant is the main difference between the sites. The maximum annual CO_2e emissions during the baseline period is conservatively represented by assuming average annual activity levels of 500,000 tons per year, and summarized in Table 3.8-5

Table 3.8-5. Baseline GHG Emissions at Maximum Historical Rate

Source	CO_2e (MT/yr)
Recycle Plant Engine	85.6
Excavation Off-Road Engines	644.8
Off-Road Vehicle Haul	549.4
Total	**1,280**

Source: AQCCIA, 2021 (see Appendix C).
Notes: Converted from App. C based on 2204.6 lb/MT. GWP of CH_4 assumed to be 28 per IPCC Fifth Assessment Report (AR5).

3.8.5.2 Excavation Phase

Equipment and activity levels for excavation in the baseline and for the Project are presented in the AQCCIA, and the associated GHG emissions are summarized in Table 3.8-6 below.

Table 3.8-6. Project Excavation Phase GHG Emissions at Proposed Maximum Annual Rate

Source	CO_2e (MT/yr)
Recycle Plant Engine	85
Excavation Off-Road Engines	638
Off-Road Vehicle Haul	598
Dewatering Pumps	95
On-Road Vehicle Haul	79
Slurry Wall Installation	613
Total	**2,108**

Source: AQCCIA, 2021 (see Appendix C).
Notes: Converted from App. C based on 2204.6 lb/MT. GWP of CH_4 assumed to be 28 per IPCC Fifth Assessment Report (AR5).

3.8.5.3 Construction Phase

The construction Phase consists of the following features:

- Site security features and on-site construction office (prefabricated trailer) including an access gate and perimeter road;
- Inflow channel consisting of a weir, chute, and dissipation pool and Outflow Channel consisting of a weir each requires an excavator, backhoe, water truck, loader, compactor, cement trucks, cement pumps, and cranes; and
- Generator building and floating barge pump, including an aboveground diesel tank, would require an excavator, water truck, backhoe, compactor, trencher and cement trucks.

3.8.5.4 Operation Phase

Calculated operation phase emissions include:

- operation of the generators;
- off-road engines for road maintenance; and
- on-road support vehicles.

Operation phase emissions are presented below in Table 3.8-7.

Table 3.8-7. Operation Phase Greenhouse Gas Emissions

Source	CO_2e (MT/yr)
Reservoir Operation Pumps	147
Off-Road Engines	23
On-Road Engines	5
Total	**175**

Source: AQCCIA, 2021 (see Appendix C).

3.8.6 Project-Level Impacts and Mitigation Measures

3.8.6.1 Generate GHG Emissions That May Have a Significant Impact on the Environment

Impact Statement

Impact GHG-1: *Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?* **(Appendix G Threshold Criteria (a)).**

Impact Analysis

"It is widely recognized that no single project could generate enough GHG emissions to noticeably change the global climate temperature. However, the combination of GHG emissions from past, present, and future projects could contribute substantially to global climate change. GHG emissions, and their associated contribution to climate change, are inherently a cumulative impact issue. Therefore, project-level impacts of GHG emissions are treated as one-in-the-same as cumulative impacts." (SJVAPCD, 2015, p. 111). As recognized by SJVAPCD in the preceding quote, climate change is a cumulative effect and no single project is large enough to impact climate change. Thus, the Project would not, by itself, either directly or indirectly result in a significant impact on the environment due to generation of GHG emissions.

This is reflected in the 2017 Scoping Plan, which regulates fuels at a level in the supply chain above the level of a single project, such that a project has no choice but to use energy in California that is already regulated. The Project therefore does not have its own emissions, but is simply a location in which GHG emissions are taking place as a result of fuel that is already regulated. Therefore, the Project itself cannot have a significant impact on the environment.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.8.6.2 Conflict With an Applicable Plan, Policy or Regulation that Reduces GHGs

Impact Statement

Impact GHG-2: *Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?* **(Appendix G Threshold Criteria (b)).**

Impact Analysis

Project emissions of GHGs are presented in Table 3.8-8 below, primarily for purposes of disclosure. SJVAPCD guidance on impact analysis for GHGs is outdated and the methods used in South Coast Air Quality Management District (SCAQMD) which are more recent were used to evaluate significance of GHG

impacts. Specifically, SCAQMD excludes emissions from sectors that are required to participate in the Cap-and-Trade Program administered by the California Air Resources Board (CARB) as discussed in the *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Project* (SCAQMD, 12/12/2014).[2] This approach takes into account the cumulative nature of the energy industry and recognizes that consumers of electricity and diesel fuel are in effect regulated by the higher level emissions restrictions on the producers of these energy sources. Energy and fuel suppliers are required to report emissions under the Cap-and-Trade. Cap-and-Trade is designed to reduce GHG emissions as needed to achieve emissions reductions described in related planning documents which primarily consists of the AB 32 Scoping Plan. Thus, the emissions reductions will occur at a level in the supply chain above the Project which will have no choice but to use fuels with GHG intensities that are consistent with the Scoping Plan.

Table 3.8-8. Project GHG Emissions

Source	CO_2e (MT/yr)
Baseline Emissions	1,280
Future Emissions (Max Year)	2,283
Total Project Emissions (Max Year)	1,003
Screening Criteria (SCAQMD)	10,000
Project Exceeds Screening Criteria?	No

Source: AQCCIA, 2021 (see Appendix C).
Note: (a) http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds.

In summary, each Project source would emit GHGs in amounts consistent with the AB 32 Scoping Plan. Therefore, the Project impact on GHG emissions is less than significant. Additionally, for context, emissions from the Project are less than the SCAQMD GHG screening criteria.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

[2] http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2014

3.8.7 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 in Section 3.0 identifies the other projects that the County and the City of Woodlake felt should be considered in regards to potential cumulative impacts. As noted in Table 3.0-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with greenhouse gas emissions. As discussed in Section 3.8.6.2 above, GHG impact assessment is cumulative by nature. The GHG threshold criteria are the amounts that are cumulatively considerable. Thus, the impact analysis prepared above demonstrates that the project will have a less than significant individual impact as well as an impact that is less than cumulatively considerable.

3.9 HAZARDS AND HAZARDOUS MATERIALS

3.9.1 Introduction

This section of the DEIR evaluates potential hazards and hazardous materials that currently exist in the area surrounding the Project site, or that could exist as a result of implementing the Project.

3.9.2 Environmental Setting

3.9.2.1 Regional Setting

The Project site is located within unincorporated Tulare County near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The Project is also located in California's Central Valley which is one of the most productive agricultural regions in the world. The Project is generally surrounded by semi-rural/agricultural land uses, specifically to the south across the Kaweah and St. Johns Rivers. The CEMEX Lemon Cove aggregate facility is located immediately north and east of the Project site, and the Seaborn aggregate facility is located immediately to the west. Nearby urban communities include the unincorporated community of Lemon Cove (approximately 1.0 miles to the southeast) and the City of Woodlake (approximately 2.5 miles to the northwest).

3.9.2.2 Vicinity Setting

Surrounding land uses in the Project site vicinity include: aggregate mining operations to the north, southwest and east; and, agricultural operations/rural residences to the west, north west and also south across the Kaweah and St. Johns Rivers. The Kaweah and St. Johns Rivers are located along the southern boundary of the Project site.

3.9.2.3 Project Site Setting

The existing Project site is relatively flat and undisturbed grassland except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs. The Project site has historically been used for cattle grazing; therefore, it is unlikely that extensive use of pesticides, herbicides or fertilizers typically used in agriculture have been used at the site. The areas immediately around the site have also been, and in some cases is still being, used for aggregate mining which typically involves the storage of fuels and maintenance materials such as grease, lubricant and other fluids used in the routine maintenance of vehicles and mining equipment. However, the use of hazardous materials at these adjacent aggregate facilities is expected to have been minimal and consistent with the routine mining operations (fuel, lubricants, oil, cleaners, grease, etc.).

As shown on Figure 3.20-1 in Section 3.20 – Wildfire, the Project site is not located within an area of Tulare County designated by the California Department of Forestry and Fire Protection (CalFire) (https://calfire.ca.gov) as a "Very High Fire Hazard Severity Zone (VHFHSZ)" area that may contain substantial fire risks and hazards. However, a designated State Responsibility Area (SRA) "High FHSZ" is located approximately 0.6 miles north/northeast of the Project site (https://osfm.fire.ca.gov/media/6830/fhszs_map54.pdf), and the southern portion of the Project is

located within a Local Responsibility Area (LRA), specifically a designated LRA "Moderate FHSZ" as designated by CalFire. There are no high-voltage power lines located on or near the Project site.

The presence of sperrylite in gravels of the Kaweah River has been raised as a potential concern for mining projects in the County. Sperrylite, also known as platinum arsenide, is a rare, naturally occurring ore that is known to occur as a trace mineral in river systems in California and that might be present in gravels of the Kaweah River.

The Project is located more than 2 miles away from the nearest public airstrip/airport, the Woodlake Airport. The larger Exeter Airport is located more than 11 miles away to the southwest of the Project site. The Project site is not located in the airport safety zone (e.g., takeoff or landing flight paths, etc.) for either airport.

3.9.3 Regulatory Setting

A number of federal, state, and local laws have been enacted to regulate the management, use, storage, treatment, transport and disposal of hazardous materials and hazardous wastes (referred to jointly as hazardous materials). An overview of the key hazardous materials laws and regulations that apply to the Project are provided below.

3.9.3.1 Federal

Resource Conservation and Recovery Act (RCRA)

RCRA (42 U.S.C. §6901 et seq.) regulates hazardous waste from the time that the waste is generated through its management, storage, and treatment until its final disposal. RCRA regulations address numerous aspects of hazardous waste management, including determination of hazardous waste, containment requirements, inspections, training, spill response, contingency plans, treatment, disposal, recycling, reporting and additional other areas of hazardous waste management. The United States Environmental Protection Agency (USEPA) has authorized the California Department of Toxic Substance Control (DTSC) to administer the RCRA program in California.

Oil Pollution Prevention

The Oil Pollution Prevention regulation (40 CFR § 112 et seq.) establishes procedures, methods, equipment and other requirements to prevent the discharge of oil and oil products from non-transportation related facilities into the waters of the United States. The regulation applies to facilities engaged in, among other activities, storing, processing, using or consuming oil and oil products. If specified storage thresholds are triggered, a Spill Prevention, Control and Countermeasure (SPCC) Plan must be prepared and implemented.

Facilities with a single tank or cumulative aboveground storage capacities of 1,320 gallons or greater of petroleum are required to prepare an SPCC plan. Exceptions to this rule include farms, nurseries, logging

and construction sites, so long as these businesses have a total storage capacity of less than 100,000 gallons or if the individual storage tanks are less than 20,000 gallons.

Occupational Safety and Health Act (OSHA)

OSHA (29 U.S.C. §651 et seq.) and federal occupational safety and health regulations (29 CFR §1910 et seq.) contain provisions for managing hazardous materials. OSHA promotes worker safety, worker training, and worker right-to-know. Hazardous Waste Operations and Emergency Response (HAZWOPER) training is required for workers who handle hazardous materials, as appropriate for their job description and responsibilities. In the State of California, the Division of Occupational Safety and Health (Cal/OSHA) implements OSHA requirements.

Emergency Planning and Community Right-to-Know Act (EPCRA)

EPCRA (42 U.S.C. §11001 et seq.), which is also known as Title III of the Superfund Amendments and Reauthorization Act (SARA), helps communities protect public health, safety and the environment from chemical hazards. EPCRA provides the requirements for emergency release notification, chemical inventory reporting and toxic release inventories for facilities that handle chemicals over certain thresholds.

Mine Safety and Health Act (MSHA)

MSHA (30 U.S.C. §801 et seq.) requires that the Mine Safety and Health Administration inspect each surface mine at least two (2) times a year to determine compliance with health and safety standards and whether an imminent danger exists. MSHA also requires rigorous training and education programs for employers and employees in the mining industry.

U.S. Department of Transportation (DOT)

DOT regulates the transportation of hazardous materials. DOT regulations (CFR Title 49) include requirements that companies transporting hazardous materials maintain a current DOT HAZMAT Certification Registration and implement a drug screening program. DOT also has stringent standards for all vehicles that transport hazardous materials as well as the hazardous waste containers used during transportation.

3.9.3.2 State

Surface Mining and Reclamation Act (SMARA)

SMARA (Cal Pub. Resources Code §2710 et seq.) provides a comprehensive set of regulations for surface mining and reclamation to ensure that adverse environmental and safety impacts are minimized and that mined lands are reclaimed to a usable and safe condition.

California Occupational Safety and Health (Cal/OSHA) Mine Safety Orders

The Cal/OSHA Mine Safety Orders (8 CCR §6950 et seq.) regulate the safe operation of mining activities including:

- Article 4: Accident Prevention Program;
- Article 6: General Safety Precautions;
- Article 11: Materials – Storage and Handling;
- Article 12: Ground Control;
- Article 15: Mining Equipment and Practices;
- Article 17: Loading, Hauling, and Dumping;
- Article 22: Fire Prevention and Control; and
- Article 40: Inspections.

Hazardous Waste Control Law (HWCL)

The California Environmental Protection Agency (CalEPA) has established regulations governing the use of hazardous materials in the state. Within CalEPA, the DTSC has primary hazardous materials regulatory responsibility, but can delegate enforcement responsibilities to local jurisdictions. State environmental health standards applicable to hazardous waste are contained primarily in Division 4.5 of Title 22 of the CCR. Title 26 of the CCR is a compilation of those chapters or titles of the CCR that are applicable to hazardous materials management.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program ("the Unified Program") (Cal. Health & Safety Code §25404 et seq.; 14 CCR §15100 et seq.) allows certain state laws and regulation to be implemented by local governmental agencies that are certified by CalEPA. The local agencies are referred to as the Certified Unified Program Agency (CUPA). The CUPA is responsible for implementing a unified hazardous materials and hazardous waste management program. The Tulare County Division of Environmental Health is the CalEPA-designated CUPA in Tulare County. Depending upon the quantities of hazardous materials actually managed at the Project site, the CUPA programs that could apply to the Project are as follows:

- Hazardous Materials Release Response Plans and Inventories (Business Plans): The California Office of Emergency Services (OES) established the Business Plan Program (19 CCR §2620 et seq.) to prevent or minimize the damage to public health and safety and the environment from a release or threatened release of hazardous materials, and to satisfy community right-to-know laws. This is accomplished by requiring businesses that handle hazardous materials over threshold quantities to prepare a Hazardous Materials Business Plan that includes a hazardous materials inventory, a site map identifying the location of hazardous materials storage, an emergency response and spill prevention plan, and a training program. The Business Plan must be submitted to the CUPA/emergency responders and updated annually.

- Aboveground Petroleum Storage Act (APSA) Program: The APSA Program (Cal. Health & Safety Code § 25270 et seq.) regulates the management of petroleum/oils stored in ASTs. It requires that the owner/operator of aboveground petroleum/oil storage tanks with cumulative capacities over 1,320 gallons prepare a SPCC Plan, conduct inspections, and implement the plan when necessary.
- Hazardous Waste Generator, On-site Hazardous Waste Management and Treatment Permitting Programs: These programs regulate the generation, management, treatment and disposal of hazardous waste (Cal. Health & Safety Code §25100 et seq.; CCR Title 22, Division 4.5). California has more stringent requirements than those established by the U.S. EPA, therefore hazardous waste is referred to as RCRA (Federal) and non-RCRA (California) hazardous waste. The regulations contain comprehensive requirements ranging from the identification of hazardous waste (RCRA/non-RCRA), specific details on how a waste must be managed based on quantities and type, various levels of permit requirements for the treatment of hazardous waste and stringent disposal requirements.
- Underground Storage Tanks (UST) Program: This Program (16 CCR §2610 et seq.) is designed to protect public health and safety and the environment from releases of petroleum and other hazardous substances from USTs. The CUPA regulates how a UST should be closed or removed. Permits must be obtained prior to initiating removal or closure of a UST. Soil sampling to identify potential contamination from the UST may be required.

California Fire Code (CFC)

The California Fire Code (CFC) also requires that a business that handles hazardous materials prepare a Business Plan as well as other regulations regarding fire safety.

Solid Waste Management

The California Department of Resources Recycling and Recovery (CalRecycle) is responsible for protecting the public's health and safety and the environment through management of the solid waste generated in California. Solid waste regulations are generally enforced through local agencies. CalRecycle works in partnership with local government, industry, and the public to reduce waste disposal and ensure environmentally safe landfills. Solid waste management provisions are outlined in the Public Resources Code, Division 30 (Cal. Pub. Resources Code §40000 et seq.).

3.9.3.3 Local

Certified Unified Program Agency

As previously described above under State regulations, the Unified Program is implemented at the local level by a local agency – the CUPA. The CUPA is responsible for consolidating the administration of the program elements within its jurisdiction. The Tulare County Division of Environmental Health is the designated CUPA in Tulare County.

Tulare County General Plan (2012)

The Environmental Resources Management (Chapter 8) and Healthy and Safety (Chapter 10) elements of the Tulare County General Plan (Tulare County, 2012) contains goals and policies regarding general hazard and risk reduction strategies and policies to minimize potential dangers to residents, workers, and visitors; reduce the level of property loss resulting from a potential disaster; and, identify ways to respond to a crisis situation. General Plan policies are also intended to protect persons and structures from fires and ensure that development minimizes the risk of creating fire hazards and provides means for defending against those hazards.

The following are applicable goals and policies taken from the Environmental Resources Management (Chapter 8) and Health and Safety (Chapter 10) elements of the Tulare County General Plan that apply to the Project.

Section 14.7 – Fire Protection and Law Enforcement

Goal PFS-7: To provide adequate fire and law enforcement facilities and services to ensure the safety of County residents and the protection of County property.

PFS-7.1 Fire Protection. The County shall strive to expand fire protection service in areas that experience growth in order to maintain adequate levels of service

PFS-7.2 Fire Protection Standards. The County shall require all new development to be adequately served by water supplies, storage, and conveyance facilities adequate volume, pressure, and capacity for fire protection.

PFS-7.3 Visible Signage for Roads and Buildings. The County shall strive to ensure all roads are properly identified by name or number with clearly visible signs.

PFS-7.5 Fire Staffing and Response Time Standards. The County shall strive to maintain fire department staffing and response time goals consistent with National Fire Protection Association (NFPA) standards.

Table 3.9-1. Fire Staffing and Reponses Time Standards

Land Use	Demographics	Staffing/Response Time	% of Calls
Urban	> 1,000 people/sq. mi.	15 FF/9 min.	15 FF/9 min.
Suburban	500-100 people/sq. mi.	10 FF/10 min.	80
Rural	< 500 people/sq. mi.	6 FF/14 min.	80
Remote*	Travel Dist. > 8 min.	4 FF/no specific response time	90
*Upon assembling the necessary resources at the emergency scene, the fire department should have the capacity to safety commence an initial attach within 2 minutes, 90% of the time. (FF = Fire Fighters) Source: Tulare County General Plan 2030 Update			

Section 8.3 – Mineral Resources-Other

Goal ERM-3: To protect the current and future extraction of mineral resources that are important to the County's economy while minimizing impacts of this use on the public and the environment.

Policy ERM-3.1 – Environmental Contamination: All mining operations in the County shall be required to take precautions to avoid contamination from wastes or incidents related to the storage and disposal of hazardous materials, or general operating activity at the site.

Section 10.1 – General (Health and Safety)

Goal HS-1: To protect County residents and visitors from injury and damage resulting from natural catastrophes, man-made events, and hazardous conditions.

Policy HS-1.2 – Development Constraints: The County shall permit development only in areas where the potential danger to the health and safety of people and property can be mitigated to an acceptable level.

Policy HS-1.5 – Hazard Awareness and Public Education: The County shall continue to promote awareness and education among residents regarding possible natural hazards, including soil conditions, earthquakes, flooding, fire hazards, and emergency procedures.

Policy HS-1.11 – Site Investigations: The County shall conduct site investigations in areas planned for new development to determine susceptibility to landslides, subsidence/settlement, contamination, and/or flooding.

Section 10.14 – Hazardous Materials

Goal HS-4: To protect residents, visitors, and property from hazardous materials through their safe use, storage, transport, and disposal.

Policy HS-4.1 – Hazardous Materials: The County shall strive to ensure hazardous materials are used, stored, transported, and disposed of in a safe manner, in compliance with local, State, and Federal safety standards, including the Hazardous Waste Management Plan, Emergency Operations Plan, and Area Plan.

Policy HS-4.2 – Establishment of Procedures to Transport Hazardous Wastes: The County shall continue to cooperate with the California Highway Patrol (CHP) to establish procedures for the movement of hazardous wastes the County.

Policy HS-4.4 – Contamination Prevention: The County shall review new development proposals to protect soils, air quality, surface water, and groundwater from hazardous materials contamination.

Tulare County Ordinance Code

The Tulare County Ordinance Code was reviewed. The County Ordinance Code does not contain any requirements or policies related to hazardous materials or hazardous wastes that apply to the Project. Therefore, the applicable goals and policies found in the County General Plan are the local regulations primarily relied upon in the analysis presented in this section.

3.9.4 Significance Thresholds

3.9.4.1 Appendix G Thresholds from the State CEQA Guidelines

According to Appendix G of the State CEQA Guidelines, the Project would have a significant effect if it would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter miles of an existing or proposed school;

d) Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment;

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would result in a safety hazard or excessive noise for people residing or working in the project area;

f) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan; or

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

3.9.4.2 Additional Thresholds of Significance

Requirements identified in the County policies and plans are addressed by the significance criteria above. There are no additional thresholds of significance related to hazards or hazardous materials.

3.9.5 Methodology of Analysis

This analysis is based on the review of applicable federal, state and local requirements, Project design features, best management practices (BMPs), operating practices and other environmental protection measures that have been incorporated into the Project to minimize potential impacts on the environment.

The hazardous materials that would most likely be used at the Project site were identified, and the associated rules and regulations were reviewed to evaluate if the Project posed a potentially significant impact associated with the management of hazardous materials. Relevant BMPs and Project design features that are incorporated into the Project to minimize potential environmental impacts associated with the management of hazardous materials and waste were evaluated.

For purposes of this hazardous materials analysis, a material is considered hazardous if it has characteristics defined as "hazardous" by the California Code of Regulations (CCR) or appears on a list of hazardous materials prepared by a Federal, State, or local agency. The CCR defines hazardous material by reference to Section 25501 of the Health and Safety Code, which provides:

> "*Hazardous material means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. 'Hazardous materials' include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the unified program agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." (Cal. Health &Safety Code §25501(m); 22 CCR §66260.10).*

A substance may be considered hazardous due to a number of criteria including, toxicity, flammability, corrosivity, or reactivity. Once a hazardous material is disposed of or no longer intended for use, it is considered "hazardous waste." Hazardous waste is any hazardous material that is abandoned, discarded, or in certain cases recycled. The same criteria, as stated above, that renders a material hazardous also renders a waste hazardous.

Based on the review of the Project's description and knowledge of materials typically found at similar mining sites, it is anticipated that the following potentially hazardous materials may be present on the Project site:

- Hazardous Materials (lubricating oils, diesel/gasoline, transmission fluid, etc.): and/or
    - Vehicle and equipment maintenance supplies and waste (i.e., motor oils, transmission fluids, brake fluids, hydraulic fluids, lubricating grease, oils, cleaning solvents); and
    - Fuel (diesel, gasoline).
- Asphaltic materials.

3.9.5.1 Project Design Features and Environmental Protection and Measures

Numerous design features, BMPs, operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental protective measures that were considered during this evaluation include, but are not limited to, the following:

1. The Project would comply with the BMPs and requirements identified in the SWPPP; Waste Discharge Requirements (WDRs); Streambed Alteration Agreement; Hazardous Materials Business Plan (HMBP); SPCC Plan; and the SMARA Reclamation Plan.
2. The use of hazardous materials at the Project site would be limited and include primarily fuels, lubricants and fluids associated with equipment and vehicles.
3. Hazardous materials would not be stored onsite during reservoir excavation and construction.
4. The 10,000-gallon aboveground storage tank (AST) used during reservoir operations for the operation of the floating pump would have secondary containment and be in compliance with the SPCC Plan.
5. The AST would not be used for fueling of vehicles or equipment.
6. Filling of the AST would only occur in a designated area with secondary containment to facilitate potential spill cleanup.
7. "No Smoking" and other hazard warning signs would be posted through the site and employees would be trained as to recognition of fire hazards and ignition sources.
8. An inspection and maintenance program would be established to ensure that vehicles and equipment are operated and maintained properly and that hazardous materials handling areas, storage areas, AST and containers meet regulatory requirements.
9. Prior to removal of topsoil and subsoil and during mining activities, the affected area would be sprayed by water trucks, as necessary to control dust and comply with air quality regulations.
10. The Project site would be designed to address stormwater runoff and drainage per the requirements of the site-specific Storm Water Pollution Prevention Plan (SWPPP).
11. The Project site would be graded to prevent sediment from leaving the site.
12. Equipment and vehicle parking/storage areas would be graded to prevent stormwater from leaving the site and/or located in the bottom of the excavated pit such that stormwater would be captured.
13. BMPs (e.g., gravel bag or rock check dams along drainage swales, silt fencing or fiber rolls to contain drainage and sediment, lined swales, etc.) would be implemented to prevent stormwater runoff in accordance with the SWPPP.
14. Excavation equipment would be inspected, maintained and repaired to ensure that the equipment is operating properly, and leaks are prevented to the maximum extent feasible.
15. Minor/routine maintenance and fueling activities conducted on-site would be done in accordance with the BMPs identified in the SWPPP.
16. Major maintenance and repairs of equipment and vehicles would be conducted off-site.

17. Hazardous materials and hazardous waste would be managed in accordance with applicable local, state and federal regulations. Any hazardous waste generated at the site would be disposed of at a permitted off-site facility.

18. Personnel would be trained in the management of hazardous materials/waste and also in surveillance and control of mosquitoes in case there is standing water after storm events.

19. Blasting would not be used for the excavation of the site.

20. In the unlikely event that an abandoned underground storage tank is discovered, the County would be notified, and the tank would be removed in accordance with applicable regulations and requirements.

3.9.6 Project-Level Impacts and Mitigation Measures

3.9.6.2 Routine Transport or Disposal of Hazardous Materials

Impact Statement

Impact HAZ-1: *Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?* **(CEQA Guidelines Threshold Criteria (a))**

Impact Analysis

The use of hazardous materials during reservoir excavation, construction, and operations would primarily include fuels, lubricants, and fluids associated with vehicles and equipment fueling and minor servicing conducted onsite. Reservoir excavation and construction activities at the Project site would involve the use of mobile equipment (e.g., excavators, dozers, scrapers, loaders, etc.). Therefore, diesel, gasoline and/or lubricating oil would be present within equipment and vehicles operating on-site. The equipment may also be refueled and receive minor maintenance (lubed and greased) onsite by mobile fueling (diesel) and maintenance trucks on an as-needed basis. These activities would be conducted in compliance with hazardous material management regulations, hazardous waste generator requirements as well as the site-specific SWPPP and Hazardous Materials Business Plan (HMBP). Any spill from vehicles or equipment would likely be small and would be cleaned up and disposed of in accordance with applicable regulatory requirements. Any transport of hazardous materials to and from the site would be conducted in compliance with federal, state and local requirements.

Reservoir operations would involve the installation and use of an approximately 10,000 gallon diesel AST, diesel generator, and a generator building near the inflow channel, all of which would be used during reservoir operations. Except for the diesel stored in the AST, hazardous materials would not be stored within the Project site. The AST would be used to fuel the generator powering the floating barge pump, and would not be used for fueling of vehicles or equipment. The AST would be dual-walled for leak protection. Filling of the AST would only occur in a designated area with secondary containment to facilitate any potential cleanup. Because the AST capacity is greater than 1,320 gallons, the Owners would be required to prepare and implement a SPCC Plan, which describes fuel storage, transfer, and spill avoidance, and spill response procedures.

Vehicle fueling and minor maintenance activities that would occur onsite would be conducted in accordance with the hazardous material regulations. Major maintenance and repairs of trucks and equipment would be conducted offsite. Additionally, because the diesel AST would be constructed, operated and maintained in accordance with the site-specific SPCC Plan and APSA requirements and regulations, the probability of an onsite spill would be minimized during reservoir operations.

In the event hazardous wastes are generated on the Project site, the hazardous waste would be transported offsite in Department of Transportation (DOT) approved containers to a permitted hazardous waste treatment, recycling or disposal facility. Potentially hazardous waste that may be generated onsite include accidental cleanup materials/soil, and rags/containers from minor maintenance activities. If hazardous waste is generated on-site, it would be in a designated 90-day storage area and/or satellite accumulation areas. Appropriate spill and emergency response equipment would be located or made available in the case of an accidental spill.

Sperrylite is a rare platinum arsenide with a limited range of occurrence. It can be found in the weathered zone of mineral deposits, and may be present as detrital grains in trace amounts within the Kaweah River gravel. Both platinum and arsenic are considered hazardous, but only in soluble forms. Because sperrylite, if present at all, would be present in very low amounts, and it is not highly soluble within the non-acidic conditions, such as at the Project site, the potential presence of sperrylite in the Kaweah river gravel is not considered to present a potentially significant concern.

For the reasons outlined above, the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and therefore the Project would have a less than significant impact with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.3 Release of Hazardous Materials into the Environment

Impact Statement

Impact HAZ-2: *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?* **(CEQA Guidelines Threshold Criteria (b))**

Impact Analysis

See response to item *a)* above. As only minimal amounts of hazardous materials would be used or stored onsite, the potential for an accidental release of significant quantities of hazardous materials that could impact the surrounding environment is less than significant.

Accidents, such as a minor spill, could occur during the routine use management of hazardous materials used at the Project site. However, the use of these materials would be conducted in accordance with the federal, state and local regulations in order to prevent or minimize the impact of a release. As discussed above, numerous design features, BMPs, operating practices and other environmental protection measures have been incorporated into the Project to minimize the potential for foreseeable upset and accident conditions involving the release of hazardous materials.

The use of hazardous materials during reservoir excavation and construction operations would mainly include fuels, lubricants, and fluids associated with mobile vehicles and equipment. Hazardous materials used as part of reservoir excavation and construction operations for onsite equipment and vehicles would primarily include fuels and lubricants. Any spill from vehicles or equipment would likely be small and would be promptly cleaned up and disposed of in accordance with applicable regulatory requirements. Other than the 10,000 diesel AST used during reservoir operations, large quantities of hazardous materials would not be stored at the Project site. While vehicles and mobile equipment may be refueled and receive minor maintenance (lubed and greased) onsite by mobile fueling (diesel) and maintenance trucks on an as-needed basis, significant equipment servicing and maintenance would be conducted offsite. Any onsite storage, handling, use and disposition of potentially hazardous materials would be conducted in compliance with the requirements outlined in the Owner's HMBP.

As discussed above, reservoir operations would involve the use of an approximately 10,000-gallon diesel AST, diesel generator, and a generator building near the inflow channel, all of which would be used during reservoir operations. Except for the diesel stored in the AST, hazardous materials would not be permanently stored within the Project site. The AST would be used to fuel the generator powering the floating barge pump, and would not be used for fueling of vehicles or equipment. Therefore, dispenser-related spillage would not occur. The AST would be dual-walled for leak protection. Filling of the AST would only occur in a designated area with secondary containment. Because the AST capacity is greater than 1,320 gallons, the Owners would be required to prepare and implement a SPCC Plan, which describes fuel storage, transfer, and spill avoidance, and spill response procedures.

Because trucks and equipment would be fueled and maintained offsite, and the AST would be constructed, operated and maintained in accordance with existing regulations, the probability of an onsite spill would be minimized. In the unlikely event of an accidental release of hazardous materials from operating vehicles or the 10,000-gallon AST, onsite employees would be trained to properly recognize, contain, and cleanup such releases. The Project site would also be designed and graded to contain accidentally released materials and stormwater that may be contaminated as a result of equipment spills or leaks. In addition to the SPCC, a site-specific SWPPP would be prepared which would outline BMP's, cleanup requirements, and other procedures that would be implemented on-site to ensure stormwater is properly contained and kept free of contaminants. Examples of BMP's include but are not limited to:

- Spill prevention, control and cleanup.
- Vehicle and equipment fueling, cleaning and repair.
- Waste handling and disposal.
- Perimeter vegetation.
- Use of silt fencing, fiber rolls or similar perimeter controls, as needed.

Because the vehicle fueling and minor maintenance activities that would occur at the site would be conducted in accordance with the hazardous material regulations and the AST would be constructed, operated and maintained in accordance with the site SPCC Plan and APSA requirements, the probability of an onsite spill would be minimized. For these reasons, an accidental release of hazardous materials that could impact the surrounding environment is unlikely, and therefore the Project would have a less than significant impact with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.4 Potential Impacts to Schools

Impact Statement

Impact HAZ-3: *Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?* **(CEQA Guidelines Threshold Criteria (c))**

Impact Analysis

The Project is not located within 0.25 miles of an existing or proposed school. The closest school site is the Sequoia Union Elementary School located approximately 0.9 miles south of the Project site. Therefore, the Project would have no impact.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.5 Listed Hazardous Waste Site

Impact Statement

Impact HAZ-4: *Would the Project be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or environment?* **(CEQA Guidelines Threshold Criteria (d))**

Impact Analysis

The GeoTracker Groundwater Ambient Assessment and Monitoring (GAMA) and EnviroStar databases were reviewed to determine whether the Project site is a listed hazardous material/waste site or located near a known contaminated site. Table 3.9-2 identifies the information available from these databases.

Table 3.9-2. Hazardous Materials Databases Reviewed

Database	Agency	Results
GeoTracker Groundwater Ambient Assessment and Monitoring (GAMA)	State Water Resources Control Board	Project site not identified on this database.
EnviroStor: Federal Superfund Sites National Priority List State Responses Stats Superfund Military Facilities Voluntary Cleanup School Sites Site Evaluations Tiered Permits Corrective Actions	Department of Toxic Substances Control	Project site not identified on any of these databases.

As shown in Table 3.9-2, The Project is not located on a site which is included on a list of hazardous material sites pursuant to Government Code Section 65962.5. Therefore, the Project would have no impact.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.6 Potential Impacts to Airports

Impact Statement

Impact HAZ-5: *Would the Project be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?* **(CEQA Guidelines Threshold Criteria (e))**

Impact Analysis

The Project site is not within 2 miles of an existing public airport or public use airport. The closest public airport/airstrip is the Woodlake Airport, located approximately 2.4 miles west of the Project site.

Although, the Project is not located near an airport or within an airport land use plan, there could be a concern that the proposed reservoir, once constructed and filled with water, would become an attractant to birds that could result in bird aircraft strike hazards for planes landing or departing from the Woodlake Airport to the west.

The Federal Aviation Administration (FAA) Advisory Circular 150/5200-33B identifies the following minimum Separation Criteria for land-use practices that attract hazardous wildlife to the vicinity of airports:

- *For airports serving piston-powered aircraft hazardous wildlife attractants must be 5,000 feet from the nearest air operations area (AOA).*

This Project is approximately 2.4 miles away from the Woodlake Airport therefore it meets the minimum separation criteria of 5,000 feet from the AOA.

- *For Airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest AOA.*

As stated above, The Project is approximately 2.4 miles away from the Woodlake Airport therefore it meets the minimum separation criteria of 10,000 feet from the AOA.

- *For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.*

The Project is 2.4 miles from the Woodlake Airport so it is within 5 miles of an airport. However, there are multiple, existing water features in the vicinity of the airport that would already have created the potential to attract wildlife, including Bravo Lake which is significantly closer to the airport than the Project. Therefore, the Project would not cause a significant increase to wildlife movement into or across the approach or departure airspace and this potential impact is considered less than significant with no mitigation required.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.7 Emergency Plans

Impact Statement

Impact HAZ-6: *Would the Project impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?* ***(CEQA Guidelines Threshold Criteria (f))***

There are no adopted emergency response or evacuation plans that would be impacted by the proposed the Project site, primarily because the Project would not result in an increased number of vehicles on public roadways (i.e., State Route 216). The evacuation route in and out of the Project site is the existing access route in the western portion of the Project site, which connects to the Seaborn site to the west and eventually Road 222. This existing ingress and egress point would sufficiently serve the Project site in the event of an emergency. Please see Section 3.20 – Wildfire, which further discusses Project site evacuation route in greater detail. Therefore, no significant adverse impacts are identified or are anticipated, and no mitigation measures are required.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.6.8 Wildland Fires

Impact Statement

Impact HAZ-7: *Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?* **(CEQA Guidelines Threshold Criteria (g))**

Impact Analysis

As shown in Figure 3.11-1 in Section 3.11 – Wildfire, the Project site is not located in a SRA or a designated Very High Fire Hazard Severity Zone (VHFHSZ)" area. However, a designated SRA "High FHSZ" is located approximately 0.6 miles north/northeast of the Project site (https://osfm.fire.ca.gov/media/6830/fhszs_map54.pdf). Additionally, the southern portion of the Project is located within a Local Responsibility Area (LRA), specifically a designated LRA "Moderate FHSZ" as designated by CalFire. Additionally, there are no high-voltage power lines located on or near the Project site.

Management of flammable materials would be conducted in accordance with applicable regulations. In addition, no flammable structures would be located onsite and there would be minimal vegetation on the Project site during the reservoir excavation, construction and operational phases. The clearing of the site to allow for excavation of the reservoir basin would result in a type of "fire break" or "safe zone" that would help prevent the spread of a wildfire originating from areas adjacent to the Project site.

In addition, existing draught-stressed vegetation and grassland onsite would be would be cleared to allow for the proposed Project; thus, further reducing a potential fire hazard onsite. Therefore, in addition to having a less than significant impact, the Project would also minimize the potential of hazards associated with a wildfire.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.9.7 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 in Section 3.0 of this DEIR identifies projects within the County and the City of Woodlake that were considered in regards to potential cumulative impacts. The County and City webpages provided a list of current and reasonably foreseeable projects that could result in cumulative impacts for the resource areas affected by the Project. As noted in Table 3.0-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with hazardous materials and/or hazardous waste.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to hazards and hazardous materials.

The context for cumulative impacts for hazardous materials/hazardous waste impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the Impact Analysis, specifically in Section 3.9.6 above for each impact threshold, the Project was determined to have either no impact or a less than significant impact. Since the Project would not result in any significant impacts related to hazardous materials or hazardous wastes, no cumulative impacts in conjunction with other cumulative projects would result.

3.10 HYDROLOGY AND WATER QUALITY

3.10.1 Introduction

This section of the DEIR provides analyses of the hydrologic and water quality related impacts of the Project. The information provided in this chapter was derived from the following studies, modeling reports and background documents:

- *McKay Point Reservoir Project – Hydrology and Water Quality Technical Study*, prepared by Osma Pekin, PhD, P.E., G.E., and Ian Hutchison, PhD., P.E., SLR International Corp. (SLR, 2022) (Appendix G);
- *McKay Point Reservoir Project – Geology and Soils Technical Study*, prepared by Osma Pekin, PhD, P.E., G.E., and Ian Hutchison, PhD., P.E., SLR International Corp. (SLR, 2021) (Appendix F1);
- *Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California*, BSK Associates, Engineers and Laboratories (BSK, 2011) (Appendix F2);
- Existing publicly-available data and reports; and
- Field observations.

3.10.2 Environmental Setting

3.10.2.1 Regional Setting

The Project is located in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California. The Central Valley was formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges. Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Project site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone. Beneath these rocks lie impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000-feet below ground surface (bgs). These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (Faunt et al., 2009). A geologic map of the region is included as Figure 3.4-1 (Geology in the Vicinity of the Project) in Section 3.7 – Geology and Soils.

The Project site is located in the Kaweah Sub-basin of the San Joaquin Valley Groundwater Basin, within the Tulare Lake Hydrologic Region (DWR, 2003) (Figure 3.10-1). The San Joaquin Valley Groundwater Basin has been designated by the California Department of Water Resources (DWR) as a high priority basin. The Project site is also near the eastern boundary of the Kaweah Delta Water Conservation District (KDWCD) (refer to Figure 3.10-3). Approximately 265,000 acres of the KDWCD is irrigated for agriculture and approximately 45,000 acres is urbanized. Numerous public and private entities within the KDWCD boundaries divert water from the Kaweah River and its distributaries, mainly for irrigation. In addition,

almost all of the land served by the KDWCD receives irrigation water obtained from groundwater, often as a supplement to surface water (Groundwater Sustainability Plan – GWSP, GKGSA, 2020).

The KDWCD and surrounding areas have been in long-term groundwater overdraft. The KDWCD-wide overdraft for the period of 2007 to 2017 was estimated at approximately 78,000 acre-feet (AF) per year. Most of the overdraft occurs in the western portion of the KDWCD, not in the Project vicinity (GKGSA, 2020).

Within the region, groundwater flows generally toward the west from areas of recharge where streams and rivers from the Sierra Nevada Mountains transition onto the alluvium (Figure 3.10-2). Groundwater elevations in the region vary from around 460-feet above mean sea level (amsl) near the Project site, to around 250-feet amsl near the City of Visalia (DWR, 2014). Groundwater is pumped in the area for agricultural and urban uses.

3.10.2.2 Vicinity Setting

The environmental setting of the vicinity is essentially the same as the Project site and is discussed below in Section 3.10.2.3.

3.10.2.3 Project Site Setting

The Project site is currently undeveloped and has been used for cattle grazing under lease arrangements. Most of the Project site is vegetated with non-native grasses.

Immediately north of the Project site is the Lemon Cove Facility. The Lemon Cove Facility includes the historic mining area which is now being used as infiltration ponds and the processing plant located in the northeast portion of the Lemon Cove Facility. The Kaweah River Rock aggregate mining and processing facility was located immediately to the west of the Project site on the Seaborn site. As discussed previously, access for the reservoir would be via Road 222, through the Seaborn site entrance to the Project site. The Kaweah South Project is also located across the river and to the south, and the Stillwell Mine is to the northeast of the Project site (see Figure 2-2 – Project Site and Land Use Map). Adjacent lands to the south and east are used for agricultural and, to a limited extent, scattered rural residential purposes.

The Project site is located in the eastern portion of Kaweah Sub-basin of the San Joaquin Valley Groundwater Basin. This area is underlain by young, unconsolidated alluvial deposits (largely sands and gravels) that originated from the nearby Sierra Nevada Mountains. These moderately to highly permeable sands and gravels extend to depths of several hundred feet or more. The Project vicinity is drained by the Kaweah River and by the St. Johns River, which drain ultimately to the Tulare Lake bed in the southern end of the San Joaquin Valley (see Figure 3.10-1). In 1962, Lake Kaweah, located upstream from the Project site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced the potential for flooding at the Project site and surrounding area.

The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Project site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the river split generally to the south and southwest toward the St. Johns River. The Project site elevation falls from approximately 472-feet amsl on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end.

Climate is typical of the foothill region of the Central Valley, with cool, rainy winters having a mean daily temperature ranging from 40° to 50° Fahrenheit (F), and hot, dry summers when daytime temperatures can exceed 100° F (see Table 3.10-1). During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the area. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and ranges. Most precipitation occurs from November through April.

Table 3.10-1. Project Vicinity Climate Summary

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average Max. Temperature (F)	56.5	62.9	68.6	75.6	84.4	92.8	99.3	97.5	91.2	80.3	66.7	56.8	77.7
Average Min. Temperature (F)	37.0	40.6	43.6	47.2	52.4	58.2	63.2	61.7	57.4	50.5	42.1	36.9	49.2
Average Total Precipitation (in.)	2.73	2.44	2.48	1.50	0.57	0.14	0.01	0.03	0.20	0.70	1.46	2.10	14.38
Average Total Snowfall (in.)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0
Pan Evaporation (in.)	1.37	1.81	3.13	4.50	7.31	9.17	10.55	9.70	7.93	5.17	2.40	1.42	64.46

Source: Evaporation data from US Army Corp of Engineers (2014), Terminus Dam, CA, period of record 2001-2007. All other climate data from WRCC (2014), Lemon Cove, California, period of record 1899-2013.

Hydrology – East Kaweah Basin

The following sections were taken from the Hydrology and Water Quality Technical Study (Appendix G). Based on studies conducted for the Greater Kaweah Groundwater Sustainability Agency (GEI/GSI, 2020) the following changes to the precipitation, evapotranspiration, and runoff in the East Kaweah Basin are projected for 2030 and 2070 respectively. These projections are compared to current, or baseline conditions determined for the period 1981 to 2010.

Precipitation

Annual precipitation is projected to change by approximately 0.5% either up or down (SLR, 2022). However, the seasonal distribution of precipitation will change with increases projected for Winter and late Summer and decreases in Spring. Specific projected changes are:

- 2030 Precipitation:

  - Annual increase of 0.06 inches or 0.4%.
  - Increases in the November to April period; maximum increase in March (0.25 inches or 10%).
  - Decrease in the May through July period; maximum decrease in May (-0.08 inches or 14%).
  - Increase in the August to September period; maximum increase in August (negligible or 9%).

- 2070 Precipitation:
  - Annual decrease of -0.09 inches or -0.6%.
  - Increases in the December to March period; maximum increase in January (0.46 inches or 17%).
  - Decrease in the April through June period; maximum decrease in May (-0.18 inches or -31%).
  - Increase in the July to September period; maximum increase in September (0.05 inches or 25%).

Evapotranspiration

Annual evapotranspiration is projected to increase, by approximately 3.2% to 8.2%. Maximum increases are projected to occur in the Winter and Spring periods. Specific projected changes are:

- 2030 Evapotranspiration:
  - Annual increase of 2.1 inches or 3.2% measured as pan evaporation.
  - Maximum relative increases occur in January (0.06 inches or 4.3%) and June (0.35 inches or 3.8%).

- 2070 Evapotranspiration:
  - Annual increase of 5.3 inches or 8.2% as pan evaporation.
  - Maximum relative increases occur in December (0.18 inches or 12.8%) and May (0.58 inches or 8.0%).

Under these conditions it can be expected that the crop demands for water would generally increase in proportion to the increased evapotranspiration estimates; by approximately 3% to 8% over time.

Runoff

Annual runoff is projected to be reduced by approximately -5% by and after 2030. A significant change is projected to occur in the seasonal distribution of runoff. Under current and the projected 2030 conditions the peak inflows occur, and are projected to occur, in May each year (i.e., in mid spring). By 2070 inflows are predicted to peak in late winter, two months earlier than March.

Storm Precipitation

As part of California's Fourth Climate Change Assessment, the California Energy Commission (CEC) sponsored a study of the projected changes to California's precipitation intensity-duration-frequency

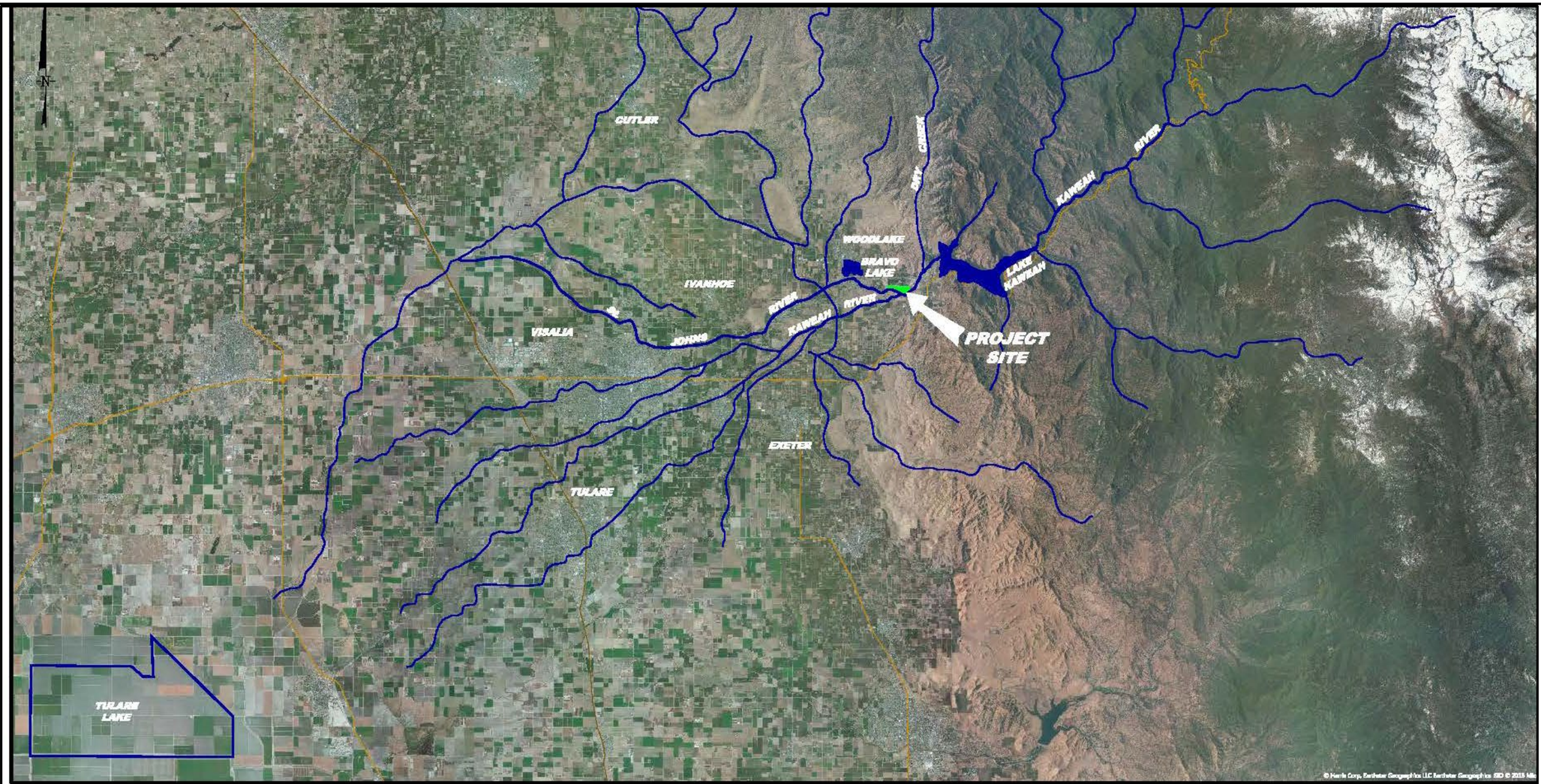
curves which evaluated how the intensity and frequency of 1-to-7-day precipitation events would change for extreme storms such as the 25-year to 100-year events, compared to those experienced in from 1950 to 1999. The projections were made for the period 2050 to 2099 (50-years). The work was undertaken by the University of California, Irvine (UCI, 2018).

The general conclusions of the study are that extreme precipitation is expected to increase across most cities in California. Climate model simulations under the Representative Concentration Pathway (RCP)[1] 8.51 project that in the future, the frequency of what is currently a 50-year event could double in both Southern and Northern California. This means that areas across California may experience extreme precipitation that is more intense and twice as frequent, relative to historical records.

The closest city to the Project that was analyzed is Fresno. Evaluation of the climate change effect on one-day storm precipitation frequencies for Fresno indicates, for example, that the precipitation values for a return period of 100-years would increase by 14% to 19% for the RCP 4.5 and RCP 8.5[1] scenarios respectively for the 50-year future projection period. The current storm precipitation amounts would occur more frequently. For example, the annual probability of occurrence of the current 100-year precipitation which is 1% could be increased to between 1.4% and 1.9% respectively (i.e., this storm event would become nearly twice as likely).

[1] A Representative Concentration Pathway (RCP) is a greenhouse gas (GHG) concentration trajectory generally adopted by the Intergovernmental Panel on Climate Change (IPCC) for climate change forecasting. The RCPs describe the possible changes in future anthropogenic (i.e., human) GHG emissions. RCP 4.5 is described by the IPCC as an intermediate scenario. Emissions peak occurs around 2040, and then declines. RCP 8.5 emissions continue to rise throughout the 21st century and this pathway is generally taken as the basis for worst-case climate change scenarios.

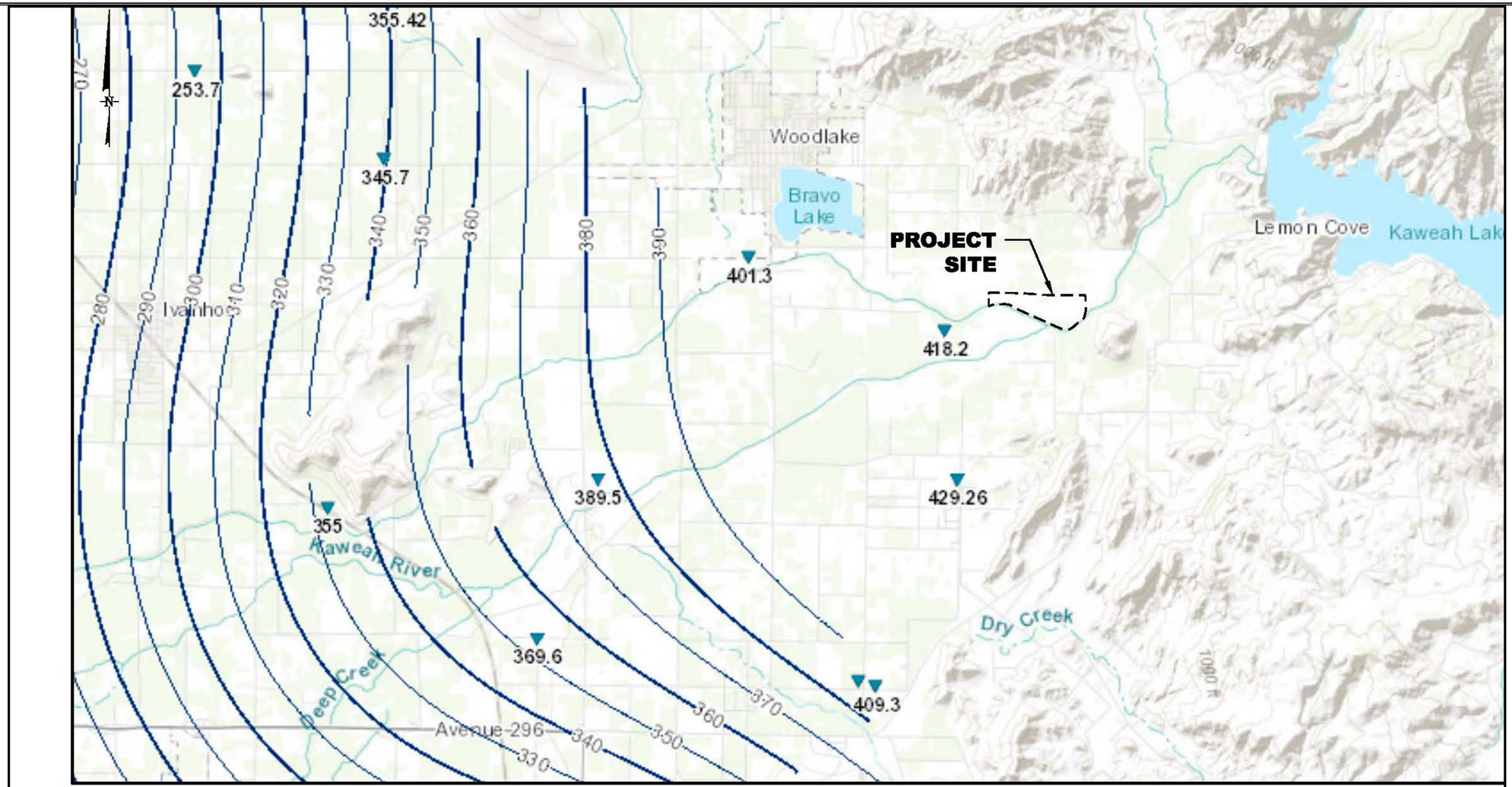
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Source: U.S. Army Corps Of Engineers Sacramento District (1990)

Figure 3.10-1 Surface Water Bodies

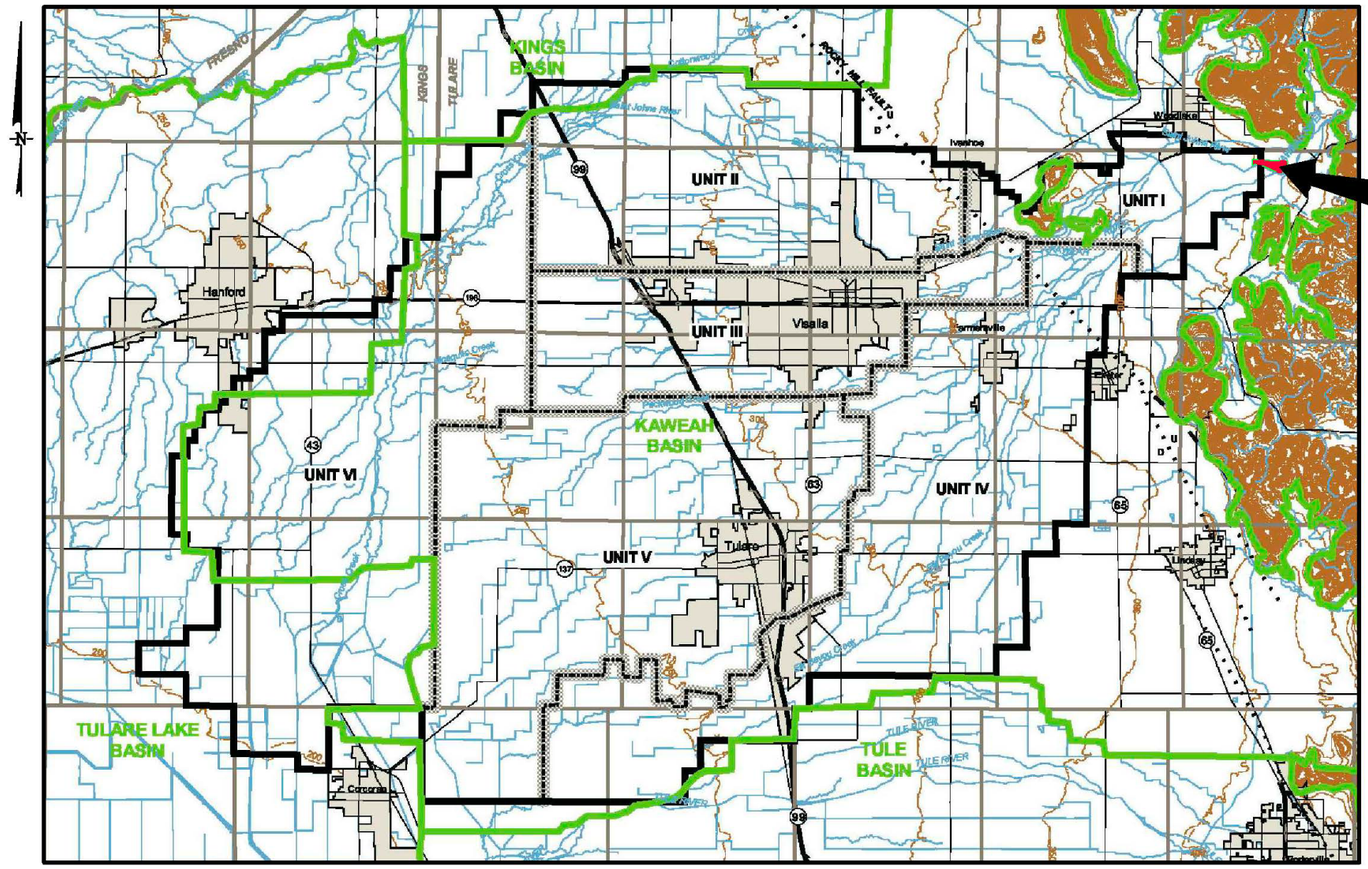
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Source: CA Department of Water Resources, Groundwater Information Center (2020)

Figure 3.10-2 Regional Groundwater Level Contours

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SOURCE: FURGO WEST, INC., JULY 2007
WATER RESOURCES INVESTIGATION OF THE KAWEAH DELTA WATER CONSERVATION DISTRICT FINAL REPORT
PLATE 2 - STUDY AREA MAP

LEGEND

- Groundwater Basins
- Fault–dashed where inferred, dotted where concealed; U, upthrown side; D, downthrown side
- District Boundary
- Hydrologic Unit Boundary
- County Line
- Township and Range Lines
- Streams
- Urban Areas

Projection: California State Plane, Zone 4, NAD83, Feet

NOTES

BOUNDARIES ARE APPROXIMATE

REPORT: ----	CLIENT: SESPE CONSULTING, INC
PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: MCKAY POINT RESERVOIR PROJECT
	TITLE: KAWEAH DELTA WATER CONSERVATION DISTRICT BOUNDARY

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Source: Furgo West, Inc. (July 2007)

Figure 3.10-3 Kaweah Delta Water Conservation District Boundary

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3.10.3 Regulatory Setting

3.10.3.1 Federal

Clean Water Act/NPDES

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), was passed in 1972 (33 U.S.C. § 1251 et seq.). The CWA is the primary federal law in the United States governing water pollution, with the objective to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing pollution from point and nonpoint sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands.

The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, without a permit (33 U.S.C. § 1342). Under the CWA, the United State Environmental Protection Agency (US EPA) has implemented the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges. Industrial facilities, such as the Project, must obtain permits if their discharges go directly to surface waters.

U.S. Army Corps of Engineers

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands (33 U.S.C. § 1344). Activities in waters of the United States regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into Waters of the United States (WOTUS), unless the activity is exempt from Section 404 regulation (e.g., water filled depressions created in dry land incidental to mining activity).

The basic premise of the program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation’s waters would be significantly degraded. In other words, when an applicant applies for a permit, an applicant must first show that steps have been taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the US Army Corps of Engineers (ACOE), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by US EPA. However, for most discharges that would have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or State basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met. For example,

minor road activities, utility line backfill, and bedding are activities that can be considered for a general permit. States also have a role in Section 404 decisions, through State program general permits, water quality certification, or program assumption (see Cal. Water Code § 13376).

FEMA Flood Insurance Rate Map

In 1962, Lake Kaweah, located upstream from the Project site, was created by the construction of Terminus Dam. The raising of the dam in 2004 significantly reduced flooding in the vicinity of the Project site, but did not eliminate it totally. Federal Emergency Management Agency (FEMA) maps indicate that the Project site is located within 100-Year Floodway (Zone AE = where Base Flood Areas Determined), and the Special Flood Hazard Area Subject to Inundation. The Tulare County General Plan – Flood Hazards and Faults (Figure 10-1) map indicates the Project site is located within the FEMA 100-year Flood Zone, and the Dam Failure Inundation Zone (Flood Insurance Rate Map [FIRM] Number 06107C0693E). Also, the following section for additional detail.

Federal Safe Drinking Water Act of 1974

First enacted in 1974 and substantively amended in 1986 and 1996, the Federal Safe Drinking Water Act (42 U.S.C. §300f et seq.) authorizes the US EPA to set national health-based standards for drinking water to protect against both naturally occurring and manmade contaminants that may be found in drinking water.

3.10.3.2 State

The Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) of 1969 (Cal. Water Code § 13000 et seq.), California's State Water Resources Control Board (SWRCB) has the ultimate authority over State water rights and water quality policy. The Porter-Cologne Act also establishes nine Regional Water Quality Control Boards to oversee water quality on a day-to-day basis at the local/regional level.

Regional Water Quality Control Board

Created by the State Legislature in 1967, the SWRCB protects water quality by setting statewide policy, coordinating and supporting the Regional Water Quality Control Boards' efforts, and reviewing petitions that contest the Regional Water Quality Control Boards' actions. The Regional Water Quality Control Boards exercise rule making and regulatory activities by basins. Tulare County falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB). As such, the Project is subject to the requirements of the *Water Quality Control Plan for the Tulare Lake Basin, Third Edition* (Basin Plan), revised May 2018 (RWQCB - Central Valley Region, 2018).

Basin plans consist of designated beneficial uses to be protected, water quality objectives (WQOs) to protect those uses, and a program of implementation needed for achieving the objectives (California Water Code, Section 13050(j)). Beneficial uses, together with their corresponding WQOs, meet Federal regulatory criteria for water quality standards. Hence, California's basin plans serve as regulatory

references for meeting both State and Federal requirements for water quality control (40 CFR Parts 130 and 131). One significant difference between the State and Federal programs is that California's basin plans establish standards for ground waters in addition to surface waters.

The Porter-Cologne Water Quality Control Act defines water quality objectives as "*...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area*" (Water Code Section 13050(h)). It also requires the Regional Water Quality Control Board (RWQCB) to establish WQOs, while acknowledging that it is possible for water quality to be changed to some degree without unreasonably affecting beneficial uses.

The 2018 Basin Plan for the Tulare Lake Basin identifies the beneficial uses and WQOs for the Project area. The beneficial uses include municipal and domestic water supply; agricultural supply; industrial service and process supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; and groundwater recharge. The Basin Plan surface water objectives include, but are not limited to, pH, dissolved oxygen, pesticides, temperature, and turbidity.

CVRWQCB's responsibilities also include drafting and enforcing waste discharge requirements (WDRs) and federal NPDES permits (Cal. Water Code § 13376). If pollutants are directly discharged into surface waters, an application for a NPDES permit must be submitted to the RWQCB. For other types of discharge, such as those affecting groundwater or in a diffused manner (e.g., erosion from soil disturbance or discharges to land), a Report of Waste Discharge must be filed with the RWQCB in order to obtain the necessary WDRs.

The SWRCB elected to issue a statewide General Permit that applies to all industrial storm water discharges requiring a permit except those from construction activities. The SWRCB adopted the General Permit on November 19, 1991, which was reissued on April 17, 1997. A new Industrial General Permit (IGP) (Order 2014-0057-DWQ) was adopted April 1, 2014 and became effective on July 1, 2015.

Section 1605 Long-Term Streambed Alteration Agreement

California Fish and Game Code Section 1602 requires an entity to notify the California Department of Fish and Wildlife (CDFW) and, if necessary, to obtain a Lake or Streambed Alteration Agreement (Agreement), before commencing any activity that may do one or more of the following: (1) substantially divert or obstruct the natural flow of any river, stream or lake; (2) substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or (3) deposit debris, waste or other materials that could pass into any river, stream or lake. If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement would be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may proceed with the activity in accordance with the final Agreement. The term of regular Agreements is generally limited to 5 years, with the potential for a 5-year renewal. Section 1605(g) allows CDFW to approve agreements for a longer term.

Sustainable Groundwater Management Act

In 2014, California adopted the Sustainable Groundwater Management Act (SGMA) (Water Code § 10720 et seq.), which became effective on January 1, 2015. The SGMA established a State policy requiring that all groundwater resources be managed "sustainably" (Water Code § 10720.1). "Sustainable groundwater management" is generally defined as the management and use of groundwater that can be maintained without causing an "undesirable result" for at least a 50-year planning and implementation horizon (*Id.* § 10721). "Undesirable results" under the SGMA include significant and unreasonable depletion of supply, significant and unreasonable reductions in groundwater storage, actions resulting in seawater intrusion, water quality degradation, land subsidence, and/or depletion of interconnected surface water (*Id.*).

The centerpiece of the SGMA was the creation of local groundwater sustainability agencies (GSAs) and the requirement that GSAs develop and implement "groundwater sustainability plans" for California's high and medium priority groundwater basins by the deadlines set forth in the SGMA (*Id.* §§ 10720.7, 10723-10724, 10727). The SGMA placed initial responsibilities on the California DWR to create the regulatory framework that GSAs would subsequently rely on in developing and implementing local groundwater management programs (*Id.* §§ 10729, 10733.2). Once DWR adopted the necessary rules and regulations, local agencies within high and medium priority basins were required to choose or establish a GSA by June 30, 2017 (*Id.* §§ 10723-10724, 10735.2(a)). GSAs then had until January 31, 2020 (for high and medium priority basins subject to critical conditions of overdraft) or January 31, 2022 (for other high and medium priority basins) to develop groundwater sustainability plans and until at least 2040 to "achieve sustainability" within their respective basins or sub-basins (*Id.* §§ 10720.7, 10727.2(b)).

As discussed in Section 3.10.2.1 above, the Project site is located in the Kaweah Sub-basin (Basin/Subbasin No. 5-022.11) of the San Joaquin Valley Groundwater Basin. The San Joaquin Valley Groundwater Basin has been designated by the California DWR as a high priority basin. Additionally, the most recent list of basins in critical overdraft was published by DWR in the 2018 Bulletin 118 update, and the San Joaquin Valley – Kaweah Sub-basin is identified as a basin subject to critical condition of overdraft. Because the basin is critically overdrafted, the Greater Kaweah GSA was formed in 2017 to manage the Kaweah Sub-basin sustainably and to prepare a Groundwater Sustainability Plans (GSPs), and a Groundwater Sustainability Plan (Greater Kaweah Groundwater Sustainability Agency, 2020) was prepared by the Grater Kaweah GSA and adopted on January 22, 2020. The Project is subject to the provisions within this Groundwater Sustainability Plan. Please see discussions in Section 3.10.12.19 for additional detail.

The SGMA grants GSAs like the Grater Kaweah GSA a broad array of authorities, including adoption of rules and regulations on groundwater extraction and use, investigatory and inspection powers, the authority to require registration of wells and use of water-measuring devices, imposition of operating restrictions on groundwater extractions, imposition of fees and penalties, enforcement powers, etc. (*Id.* §§ 10725.2, 10725.4, 10725.8, 10726.4, 10730, 10730.2, 10732). The SGMA does not modify rights or priorities to extract and use groundwater and also does not impact rights to surface water (*Id.* § 10720.5).

3.10.3.3 Local

Tulare County General Plan

The County General Plan has a number of policies that apply to projects. General Plan policies that relate to the proposed Project are listed in Section 3.4 – Land Use and Planning, specifically in Table 3.8-2, along with Project consistency determinations regarding the listed policies. The following are the primary General Plan policies that relate to the hydrology and water quality impact evaluation for the Project:

Section 11.1 – General

Goal WR-1: To provide for the current and long-range water needs of the County and for the protection of the quality and quantity of surface and groundwater resources.

Policy WR-1.1 – Groundwater Withdrawal: The County shall cooperate with water agencies and management agencies during land development processes to help promote an adequate, safe, and economically viable groundwater supply for existing and future development within the County. These actions shall be intended to help the County mitigate the potential impact on groundwater resources identified during the planning and approval processes.

Policy WR-1.5 – Expand Use of Reclaimed Wastewater: To augment groundwater supplies and to conserve potable water for domestic purposes, the County shall seek opportunities to expand groundwater recharge efforts.

Policy WR-2.1 – Protect Water Quality: All major land use and development plans shall be evaluated as to their potential to create surface and groundwater contamination hazards from point and non-point sources. The County shall confer with other appropriate agencies, as necessary, to assure adequate water quality review to prevent soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products, or wastes; floating debris; and runoff from the site.

Policy WR-2.2 – National Pollutant Discharge Elimination System (NPDES) Enforcement: The County shall continue to support the State in monitoring and enforcing provisions to control non-point source water pollution contained in the U.S. EPA NPDES program as implemented by the Water Quality Control Board.

Policy WR-2.3 – Best Management Practices (BMPs): The County shall continue to require the use of feasible BMPs and other mitigation measures designed to protect surface water and groundwater from the adverse effects of construction activities, agricultural operations requiring a County Permit, and urban runoff in coordination with the Water Quality Control Board.

Policy WR-2.4 – Construction Site Sediment Control: The County shall continue to enforce provisions to control erosion and sediment from construction sites.

Policy WR-2.5 – Major Drainage Management: The County shall continue to promote protection of each individual drainage basin within the County based on the basins unique hydrologic and use characteristics.

Policy WR-2.6 – Degraded Water Resources: The County shall encourage and support the identification of degraded surface water and groundwater resources and promote restoration where appropriate.

Policy WR-2.8 – Point Source Control: The County shall work with the Regional Water Quality Control Board to ensure that all point source pollutants are adequately mitigated (as part of the California Environmental Quality Act review and project approval process) and monitored to ensure long-term compliance.

Policy WR-3.1 – Develop Additional Water Sources: The County shall encourage, support and, as warranted, require the identification and development of additional water sources through the expansion of water storage reservoirs, development of groundwater banking for recharge and infiltration, and promotion of water conservation programs, and support of other projects and programs that intend to increase the water resources available to the County and reduce the individual demands of urban and agricultural users.

Policy WR-3.10 – Diversion of Surface Water: Diversions of surface water or runoff from precipitation should be prevented where such diversions may cause a reduction in water available for groundwater recharge.

Section 10.5 – Flood Hazards

Goal HS-5: To minimize the possibility for loss of life, injury, or damage to property as a result of flood hazards.

Policy HS-5.1 – Development Compliance with Federal, State and Local Requirements: The County shall ensure that all development within the designated floodway or floodplain zones conforms with FEMA regulations and the Tulare County Flood Damage Prevention Ordinance.

Policy HS-5.2 – Development in Floodplain Zones: The County shall regulate development in the 100-year floodplain zones as designated on maps prepared by FEMA in accordance with the following:

1. Critical facilities (those facilities which should be open and accessible during emergencies) shall not be permitted.
2. Passive recreational activities (those requiring non-intensive development, such as hiking, horseback riding, picnicking) are permissible.
3. New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, infrastructure, and ensure safe access and evacuation during flood conditions.

Policy HS-5.4 – Multi-Purpose Flood Control Measures: The County shall encourage multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks, and lakes. Where appropriate, the County shall also encourage the use of flood and/or storm water retention facilities for use as groundwater recharge facilities.

Policy HS-5.5 – Development in Dam and Seiche Inundation Zones: The County shall review projects for their exposure to inundation due to dam failure. If a project presents a direct threat to human life, appropriate mitigation measures shall be taken, including restriction of development in the subject area.

Policy HS-5.6 – Impacts to Downstream Properties: The County shall ensure that new County flood control projects will not adversely impact downstream properties or contribute to flooding hazards.

Policy HS-5.9 – Floodplain Development Restrictions: The County shall ensure that riparian areas and drainage areas within 100-year floodplains are free from development that may adversely impact floodway capacity or characteristics of natural/riparian areas or natural groundwater recharge areas.

Policy HS-5.11 – Natural Design: The County shall encourage flood control designs that respect natural curves and vegetation of natural waterways while retaining dynamic flow and functional integrity.

3.10.4 Significance Thresholds

3.10.4.1 Appendix G Thresholds from the State CEQA Guidelines

A hydrology or water quality impact is considered significant if it would result in any of the following CEQA Guidelines, Appendix G Thresholds:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

- *I. result in substantial erosion or siltation on- or offsite;*
- *II. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;*
- *III. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or*
- *IV. impede or redirect flood flows?*

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.10.4.2 Additional Thresholds of Significance

Requirements identified in the County policies and plans are addressed by the significance thresholds above. There are no additional thresholds of significance used in this evaluation of hydrology and water quality.

3.10.5 Methodology of Analysis

Hydrology and water quality impacts were determined based on an evaluation of existing Project site surface and groundwater hydrology and water quality conditions, and consideration of Project water supply/consumption and potential changes to surface and groundwater hydrology and quality due to Project ground disturbance and land uses. As discussed in Section 3.10.1, this section of the DEIR presents a discussion of baseline conditions at the Project site based on, but not limited to, information obtained from the following:

- *McKay Point Reservoir Project – Hydrology and Water Quality Technical Study*, prepared by Osma Pekin, PhD, P.E., G.E., and Ian Hutchison, PhD., P.E., SLR International Corp. (SLR, 2022) (Appendix G);
- *McKay Point Reservoir Project – Geology and Soils Technical Study*, prepared by Osma Pekin, PhD, P.E., G.E., and Ian Hutchison, PhD., P.E., SLR International Corp. (SLR, 2021) (Appendix F1);
- *Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California*, BSK Associates, Engineers and Laboratories (BSK, 2011) (Appendix F2);
- Existing publicly-available data and reports; and
- Field observations.

The following sections present the baseline conditions used in this evaluation.

A total of six (6) soil borings were conducted at the Project site in November 2011 (BSK, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Project area ranges between approximately 40- and 100-feet (SES, 2012). Alluvial deposits at the Project site consist of sand that is about 15- to 20-feet thick. Luhdorff and Scalmanini (1995) describe these sediments as Younger Alluvium. Below this sand interval, cobbles, boulders with sand, clay, and silt are common. These deposits extended to a depth of about 40-feet on the eastern portion of the Project site, and to about 100-feet on the western portion. Luhdorff and Scalmanini (1995) describe these sediments as Older Alluvium. Geologic cross-sections for the Project site have been prepared by Schmidt (2012) and for this study, and are included in Attachment A of Appendix G – McKay Point Reservoir Project Hydrology and Water Quality Technical Study (SLR, 2022).

3.10.5.3 Groundwater

The shallow aquifer at the Project site is composed of the alluvial deposits associated with the local rivers. In some areas near the Project site where overlying sediments are relatively thin, such as the Lemon Cove and Lindmore community areas south of the Project site, weathered bedrock forms the predominant aquifer. For example, one Lemon Cove public supply well is screened in the bedrock aquifer. Most of the groundwater production south of the Kaweah River is from the bedrock interval (Schmidt, 2012).

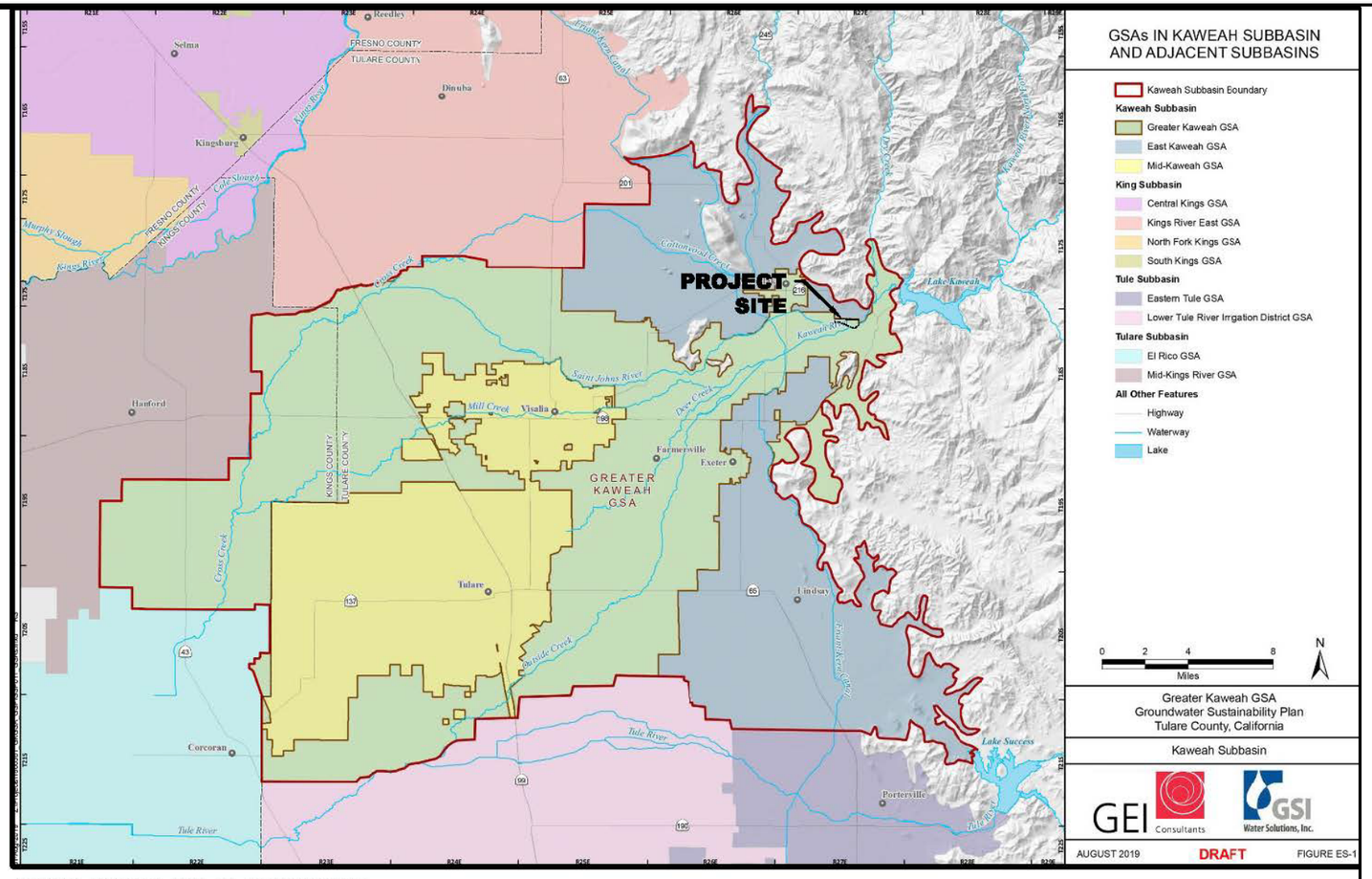
Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley (Figure 3.10-2). Groundwater elevations in the region vary from around 460 feet amsl near the Project site, to around 250-feet amsl near the City of Visalia (DWR, 2014). Groundwater is pumped in the area for agricultural and urban uses.

The Project site is in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (DWR, 2003). The Project site is also near the eastern boundary of the KDWCD (Figure 3.10-3). Approximately 265,000 acres of the district is irrigated for agriculture, and about 45,000 acres is urbanized. Numerous public and private entities within the district boundaries divert water from the river and its distributaries mainly for irrigation. In addition, almost all the land within the KDWCD receives some irrigation water obtained from groundwater, often as a supplement to surface water (Groundwater Sustainability Plan – GWSP, GKGSA, 2020).

KDWCD and surrounding areas have been in long-term groundwater overdraft. The KDWCD wide overdraft for the period 2007 to 2017 was estimated at approximately 78,000 AF/year. Most of the overdraft occurs in the western portion of the district; not the Project vicinity (GKGSA, 2020).

In January 2020, the Greater Kaweah Sustainability Agency (GKGSA) published its “Groundwater Sustainability Plan” (GWSP). The purpose of the GWSP, is among others, to identify and describe Minimum Thresholds and Measurable Objectives for each monitoring location for each applicable Sustainability Indicator, as required to achieve the Sustainability Goal, and to define and identify Projects and Management Actions proposed by the GKGSA to achieve the Sustainability Goal. The Sustainability Plan area and its jurisdictional boundaries are shown on Figure 3.10-4. The reservoir would be in Hydrogeologic Zone 10 within these boundaries. For this zone, the Minimum Threshold and Measurable Objective groundwater levels have been established for Well KSB-2822 (also referred to as 18S27E05J001M), located between the St. Johns and Kaweah Rivers (Figure 3.10-5), as 421- and 420-feet amsl respectively. The levels at KSB-2822 are at the Minimum Threshold and Measurable Objective levels established by the GKGSA.

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SOURCE: GREATER KAWEAH GROUNDWATER SUSTAINABILITY AGENCY, JANUARY 22, 2020

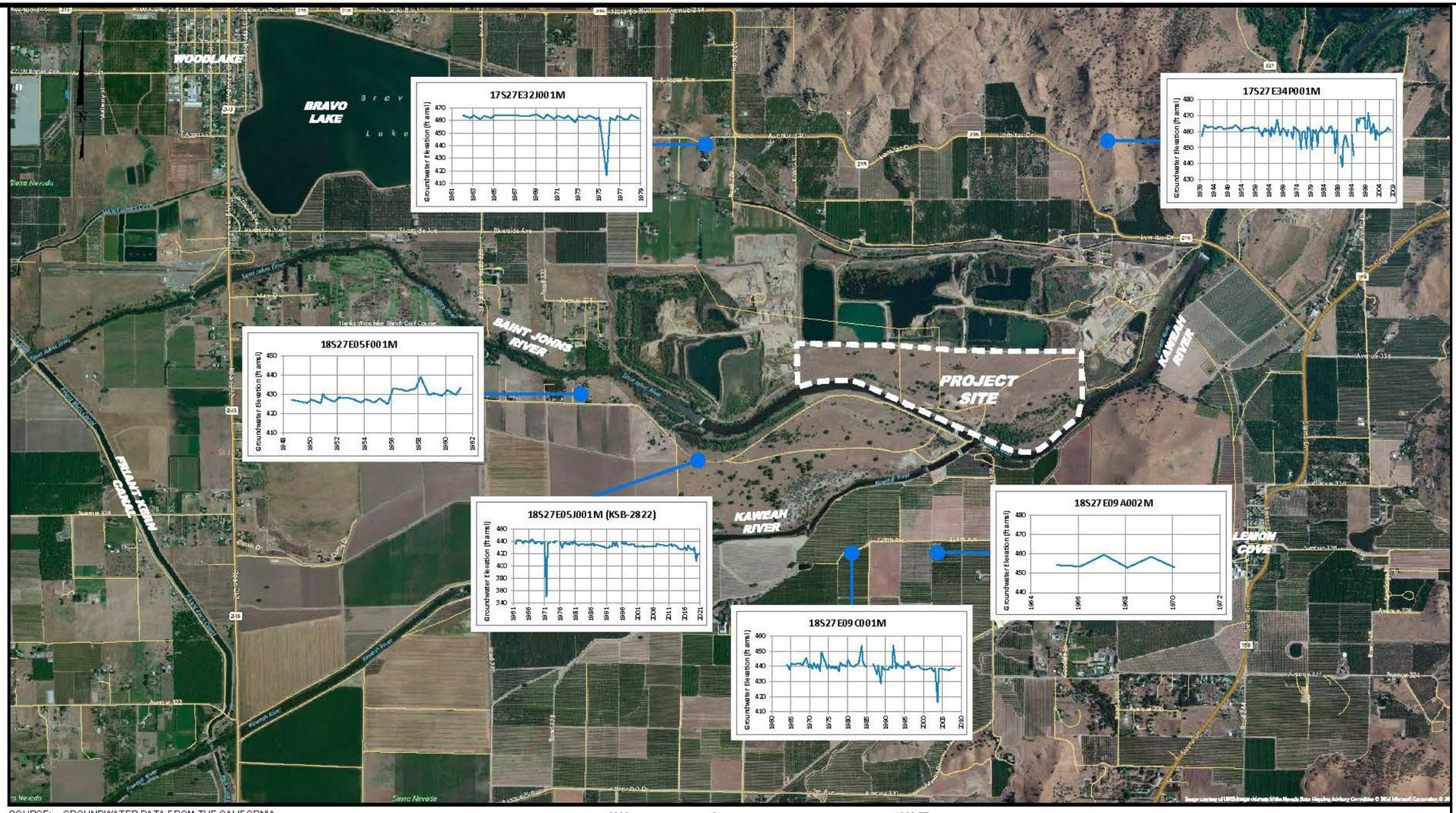
REPORT ----	CLIENT **SESPE CONSULTING, INC**
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**
	TITLE **GREATER KAWEAH GROUNDWATER SUSTAINABILITY AREA**

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Source: Greater Kaweah Groundwater Sustainability Agency (January 22, 2020)

Figure 3.10-4 Greater Kaweah Groundwater Sustainability Area

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Source: Groundwater Data from the California Department Of Water Resources (SLR, 2022).

Figure 3.10-5 Select Groundwater Hydrographs in Site Vicinity

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Source: Groundwater Contours From Kenneth D. Schmidt And Associates (November-December, 2011)

Figure 3.10-6 Groundwater Levels in the Vicinity

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The shallow aquifer in the Project site vicinity is unconfined (Schmidt, 2012) and water levels are significantly higher than the Minimum Threshold and Measurable Objective levels. The long-term water level measurements for wells in the region surrounding the Site indicate stable water levels, except for temporary declines during drought periods (Figure 3.10-5). Seasonal water level fluctuations in the Project site vicinity have generally varied by less than 20-feet for the last 50 years (Fugro, 2007). Within the Project site, approximate water level elevations ranged from 463-feet amsl near the east edge of the Lemon Cove Facility, to just under than 430-feet amsl in the western part of the Project site in December 2011 (Figure 3.10-6) based on six borings sampled during the site investigation program. The CEMEX excavations located immediately to the north of the Project site, have exposed groundwater because of the permitted surface mining on that site. As presented in Appendix G, groundwater level elevations have ranged from about 438- to 443-feet amsl in the area immediately northwest of the Project site, to between 456- to 460-feet to the northeast of the Site in the 2008 to 2010 period.

The main source of recharge to the aquifers in the Project area is groundwater flow from the east. Localized groundwater gradients suggests that the St. Johns and Kaweah Rivers lose some of their flow to infiltration, and that these rivers are sources of groundwater recharge. Other sources of groundwater recharge in the Project site vicinity include infiltration of water used for irrigation, and infiltration from local irrigation ditches in the area and from seasonal surface water flow.

Groundwater Quality

Groundwater in the region is generally considered suitable for beneficial uses, including municipal/domestic, industrial, and agricultural purposes except for a few instances that are discussed below. In the Project vicinity, groundwater quality is favorable with respect to physical parameters (total dissolved solids, pH, and specific conductivity), and other major constituents related to potability (such as chloride, and sulfate, and nitrate). Groundwater in the Project area generally reflects the properties of local surface water runoff, which serves as a replenishment source. While there are localized occurrences of high dissolved minerals or high nitrate levels due to the influence of land use (e.g., infiltration of irrigation tailwater), groundwater generally satisfies Title 22 Drinking Water Standards and is utilized as a drinking water source for municipalities, small community systems, and individual households. High concentrations of iron and manganese are also known to occur in the region, which in some instances may exceed secondary drinking water standards (Luhdorff and Scalmanini, 2004).

Consistent with the regional characteristics, groundwater quality at the Project site is characterized by relatively low conductance and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition. Samples collected from monitoring wells completed in the younger alluvium and the older alluvium at the project site had specific conductance values of 120 to 260 umhos/cm and total dissolved solids (TDS) levels of 95 to 170 mg/l (Jones & Stokes, 1998). Calcium and bicarbonate are the predominant cation and anion. Compared with sources to the west, the groundwater in the project area exhibits lower mineralization due to the apparent influences of surface waters in the Kaweah and St. Johns Rivers (Bookman-Edmonston 1972).

Several locations surrounding the project vicinity have experienced degraded groundwater quality in the shallower aquifers due to agricultural practices in the area. Examples include the Lemon Cove area, the areas immediately south of Wutchumna Hill and west of the reservoir, which have elevated levels of nitrate in groundwater, up to approximately 100 mg/L (Schmidt, 2001).

The City of Woodlake has also reported problems with elevated nitrate concentrations and is concerned with any project that may increase degradation (Jones & Stokes, 1998). Other than nitrate, groundwater and surface water in the Site vicinity appear suitable for existing beneficial uses (Fugro, 2007).

3.10.5.4 Surface Water

The east side of the San Joaquin Valley consists of a broad plain formed by coalescing alluvial fans associated with streams draining the western slopes of the Sierra Nevada (Figure 3.10-1). The southern end of the San Joaquin Valley is known as the Tulare Basin. The Tulare Basin is hydrologically closed. Instead of flowing to the ocean, streams from the Sierra Nevada flowing into the Tulare Basin terminate at depressions, the largest of which is the Tulare Lakebed.

The primary natural surface water bodies in the Project site vicinity are the Kaweah River and St. Johns River, which form the eastern and southern Project site boundaries. The Kaweah River flows westward from its headwaters in the Sierra Nevada. Along the southern Project site perimeter at a location referred to as McKay Point, the Kaweah River bifurcates into two rivers, forming the St. Johns River, as is illustrated in Figure 3.10-7. This figure also depicts the series of ponds located just north of the Project site at the adjacent Lemon Cove Facility. These ponds consist of exposed groundwater, created by previous mining beneath the groundwater elevation.

Downstream of the site, the Kaweah River historically branched into 8 to 10 shallow channels that overflowed during high flows, creating marshlands. These shallow channels were later integrated into irrigation canals and ditches for the delivery of irrigation water in support of the agricultural industry. These channels still carry non-irrigation flow to the Tulare Lakebed but only during periods of extraordinary precipitation or snow melt (refer to Figure 3.10-1).

In 1962, Lake Kaweah, located approximately 3.0 miles upstream of the Project site, was created by the construction of Terminus Dam (Figure 3.10-1). Construction of this dam provided storage of irrigation water and flood protection for downstream areas. Lake Kaweah has a capacity of approximately 185,630 acre-feet (AF). Flood control considerations require that, between November and March, a portion of Lake Kaweah volume be reserved to store runoff in high rainfall or snowmelt events. Therefore, during a wet year the Lake typically releases most of the water to maintain low levels. In dry years, Lake Kaweah outflow is typically very low in winter with sporadic increases in response to significant precipitation or snowmelt conditions.

Storage for water supply begins in late winter and releases increase in late spring and early summer. In wetter years, releases may begin in late winter and remain high (above 1,500 to 2,000 cfs) through spring

and early summer (EPA, 2005; Army Corp, 2005; Kaweah, and St. Johns Rivers Association – Water Master Reports though 2007). Water released from the Terminus Dam serves multiple local water districts such as the Tulare Irrigation District (TID) and the Kaweah Delta Water Conservation District (KDWCD) as well as several small ditch companies. The dam also discharges water to generate hydroelectricity.

During a typical average year streamflow upstream from McKay Point (gauge Kaweah River at McKay Point) is intermittent for about 8 months during late summer through late winter (September through April (Watermaster Reports). When they occur, flows can typically range up to 1,000 to 2,000 cubic feet per second (cfs). During June and July flows are more consistent with maximum flows still ranging up to approximately 2,000 cfs or higher (Table 3.10-2 below).

Table 3.10-2. Kaweah River at McKay Point – Monthly Flows (Period 2001-2020)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average (cfs)	313	355	298	314	731	1,359	1,265	525	94	15	61	127	455
Average (cfs)	---	---	---	---	8	454	207	15	---	---	---	---	61
Maximum monthly (cfs)	1,862	2,071	2,241	1,709	2,241	2,303	2,135	1,609	701	178	668	723	1,274
Average (AF)	19,261	19,701	18,301	18,665	44,939	80,854	77,805	32,286	5,577	907	3,637	7,832	329,765

Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020.

The annual flows vary significantly and since 2001 have ranged from 43,815 AF per year to 922,247 AF per year. The gauged values are summarized in Table 3.10-3 below. In approximately 30% of the years the flow is above average, and in the remaining 70% of the years, below average.

Table 3.10-3. Kaweah River at McKay Point – Annual Flows (Period 2001-2020)

Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow	211,316	237,860	**358,716**	176,410	**548,184**	**640,557**	115,958	266,014	242,423	454,670
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
Flow	**746,509**	200,737	99,523	52,893	43,813	287,178	**922,247**	202,334	**631,189**	156,873

Notes:
- Values above shown in AF per year.
- Bold values are years with above average flows.
- Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.

Flows arriving at McKay point are divided between the St. John and Kaweah Rivers by the McKay Point Structure which consists of two flow control structures, one in the St. Johns and one in the Kaweah River. These water control facilities are owned and operated by the Kaweah Delta Water Conservation District (KDWCD) and the Kaweah & St. Johns Rivers Association. Both check structures are located immediately

downgradient of McKay Point. The check structures can be closed or opened to control flow rates in the St. Johns and Kaweah Rivers.

Dry Creek flows into the Kaweah between Terminus Dam and McKay Point and is the largest source of runoff below Terminus Dam (refer to Figure 2-4 in Section 2.0 – Project Description, and Figure 3.10-8 below). Dry Creek flows southward from its headwaters and joins the Kaweah approximately 1.0 mile down from Terminus Dam. Water supply diversions begin immediately downstream of the dam through Hawkeye, Lemon Cove, and Foothill Ditches, and flows diverted are less than 10,000 AF per year total. Farther downstream, Wutchumna Ditch Company diverts water into Bravo Lake, a 4,000 AF reservoir (U. S. Army Corps of Engineers, 1990).

Spills from the irrigation systems of the Kaweah and St. Johns Rivers are limited to the above average years as shown by the measured flows in Table 3.10-4.

Table 3.10-4. Spillages from the Kaweah and St. Johns River Irrigation Areas

Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow (1)	0	0	530	0	201	9,940	0	0	0	0
Flow (2)	0	0	0	0	0	19,406	0	0	0	0
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
Flow (1)	11,833	0	0	0	0	0	8,028	0	3,521	0
Flow (2)	0	0	0	0	0	0	37,814	0	331	0

Notes:

- Measured at (1) elk bayou below Road 96 and (2) cross creek at Highway 43 to Tulare Lake – annual flows in AF/year (period 2001-2020).
- Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.

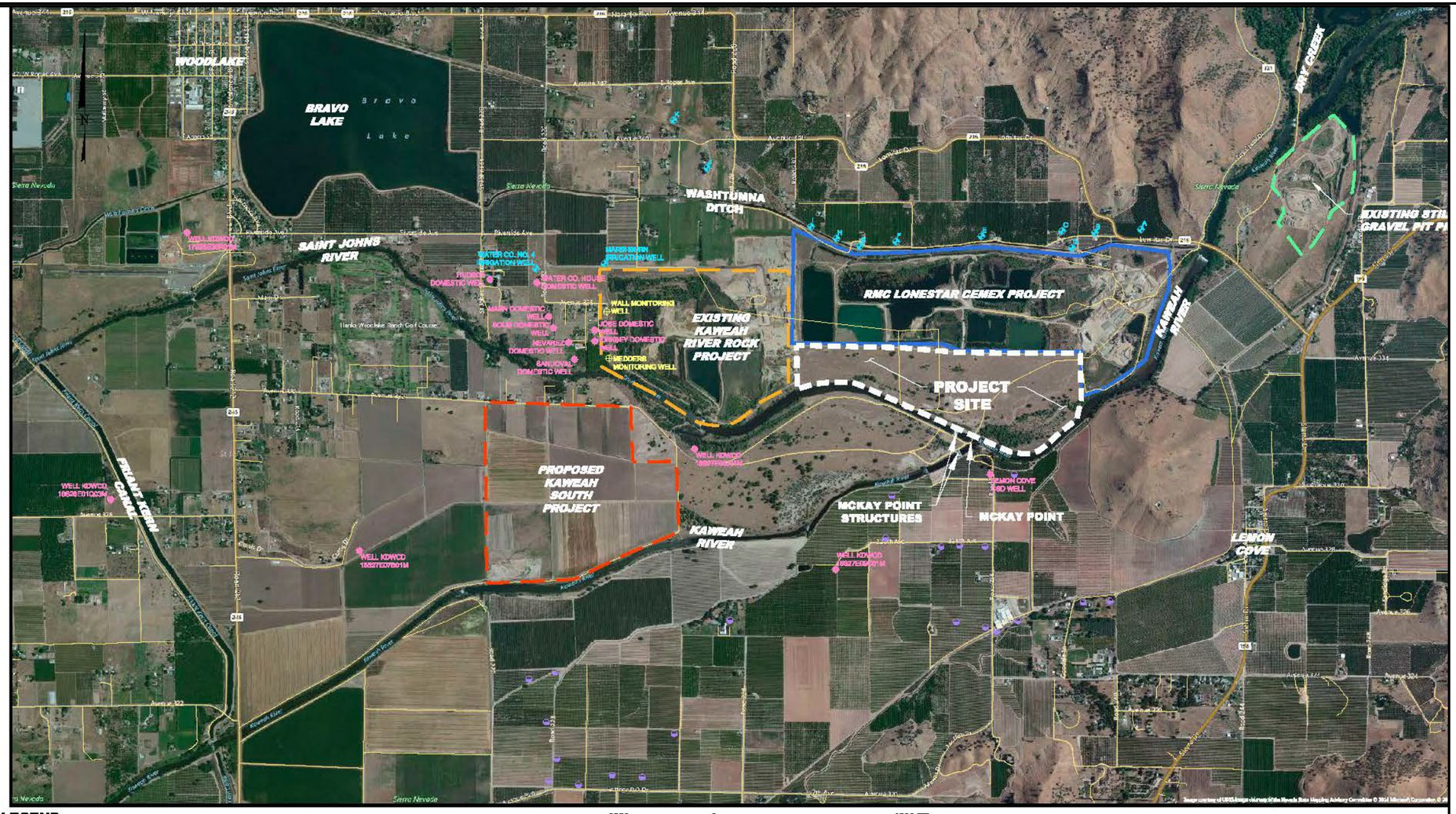
3.10.5.5 Flooding

Before Terminus Dam was constructed, extraordinary storm events in December 1955 resulted in an estimated peak flood discharge at McKay Point of 87,000 cfs, the largest peak runoff from the Kaweah River watershed in the 20th century. Since the construction of Terminus Dam in 1962, most flooding concerns for areas downstream of the dam were greatly alleviated. For example, the peak inflow to Lake Kaweah during the 1966 flood was 105,000 cfs, whereas the maximum release from the dam was 5,666 cfs. Lake Kaweah is operated with an objective of maintaining a flow of less than 5,500 cfs at McKay Point, which includes flow from undammed tributaries such as Dry Creek. Above this flow rate, flood damage can occur to downstream properties, infrastructure, and municipalities (US Army Corps, 1990).

The Terminus Dam height was increased by approximately 21-feet in 2004, which further reduced flooding in the area (US Army Corp, 2005). It is estimated that currently the dam provides protection for a design flood event of a 50-year return period (FEMA, 2009).

FEMA has prepared a flood hazard map for the area including the Project site (Figure 3.10-9 – FEMA Flood Hazard Zone). FEMA has calculated base flood elevations for the Lower Kaweah River and St. Johns River (i.e., only downstream of McKay Point). Upstream of McKay Point, the FEMA 100-year flood inundation area is not based on any hydrologic analysis or calculations. The flood hazard map indicates that the 100-year flood level near the Project site along the St. Johns River is approximately 465 feet amsl or similar. During most flooding conditions, major and minor flooding in the area is dissipated by diversions to the network of irrigation ditches, irrigation diversions, channel percolation, and evapotranspiration (US Army Corps, 1990).

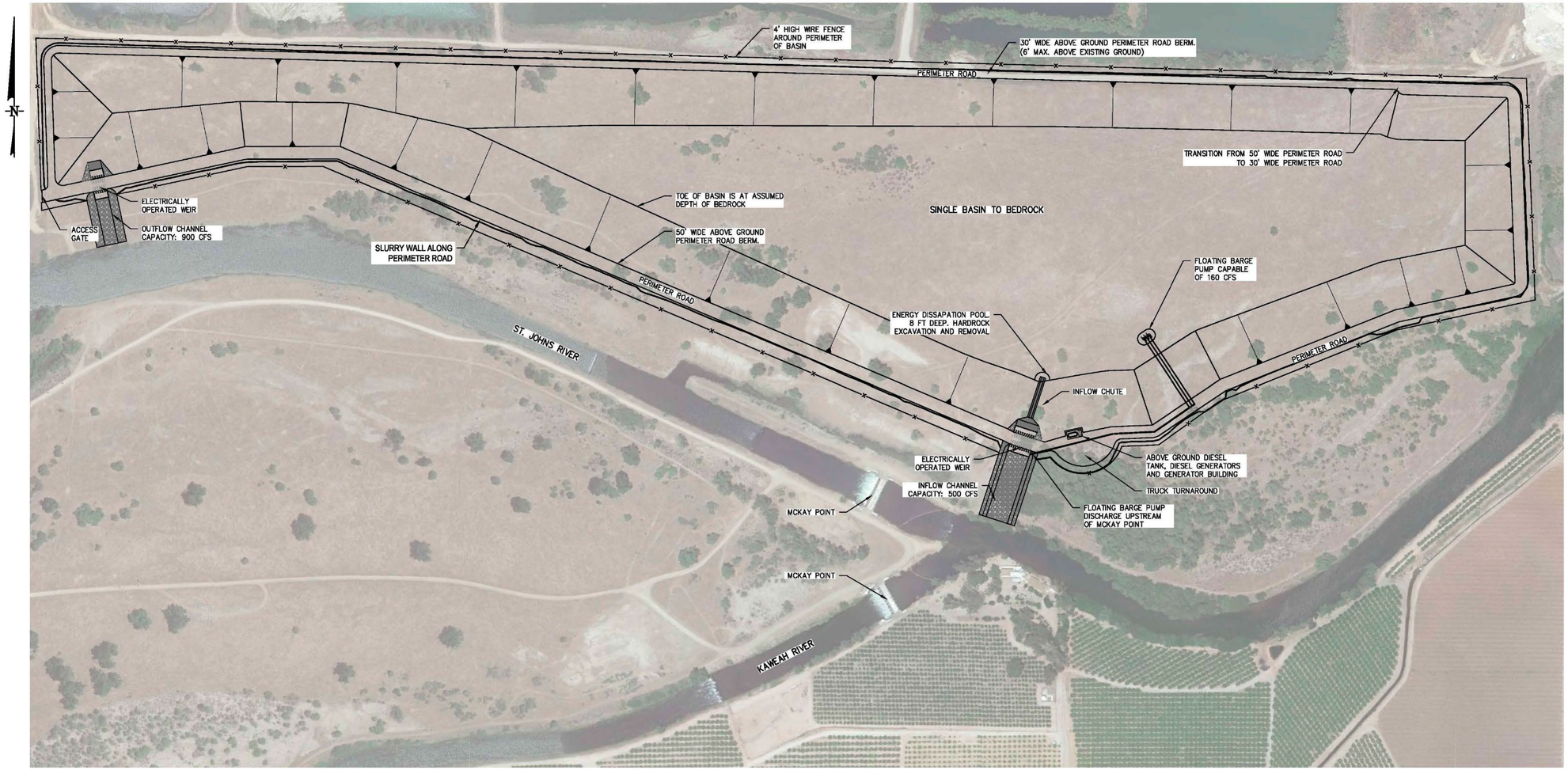
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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-7 Hydrology and Water Quality – Site Vicinity Map

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SOURCE: PROVOST & PRITCHARD, 2/18/14
FIGURE 1 - PROPOSED SITE MAP

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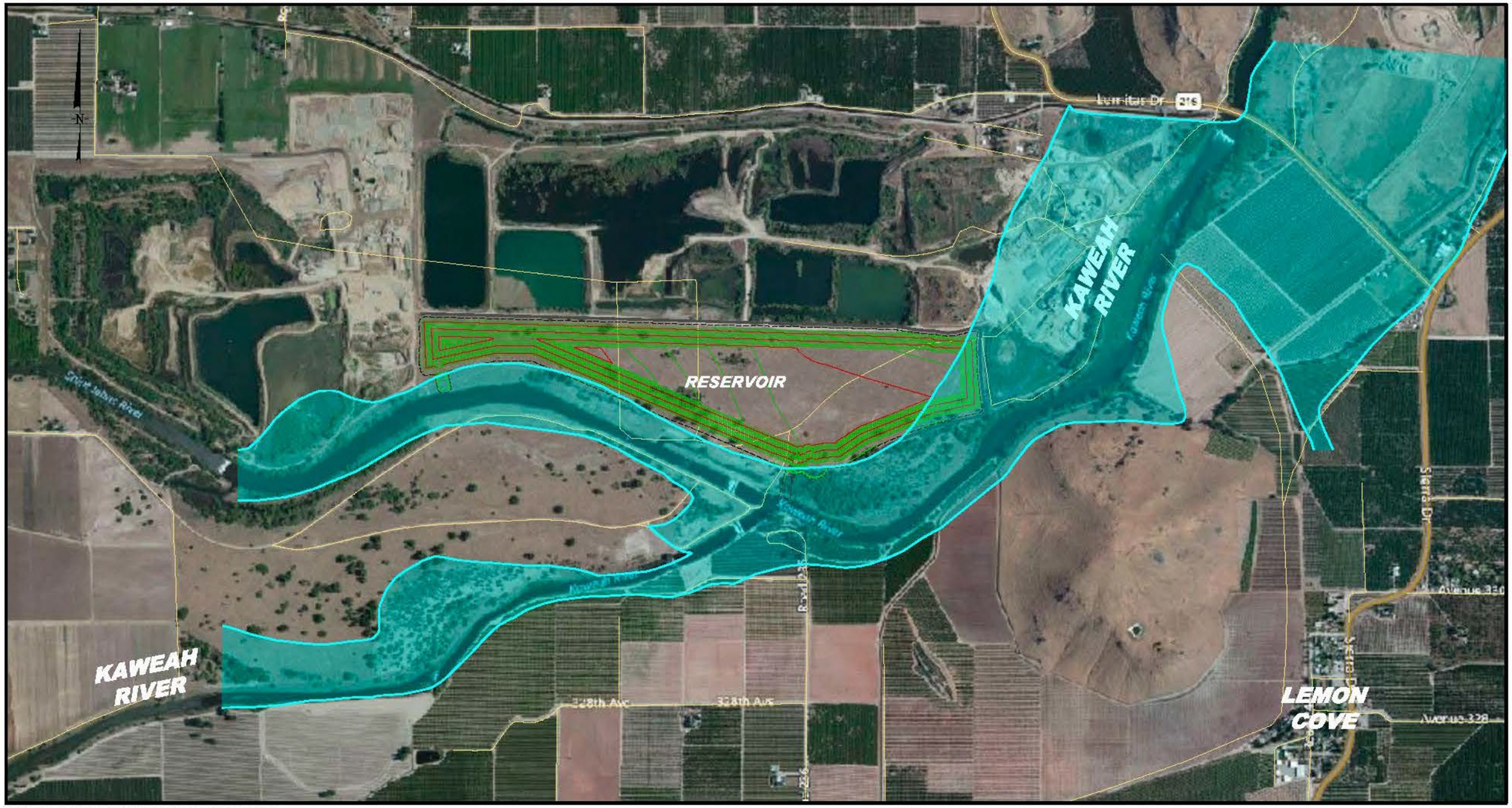
REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **MCKAY POINT RESERVOIR CONCEPTUAL ILLUSTRATION**	FIGURE No. / REV A

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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-8 McKay Point Reservoir – Conceptual Illustration

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SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

1000 0 2000 FT

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION
BY THE 1□ ANNUAL CHANCE FLOOD (100-YEAR FLOOD)

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS ARE APPROXIMATE

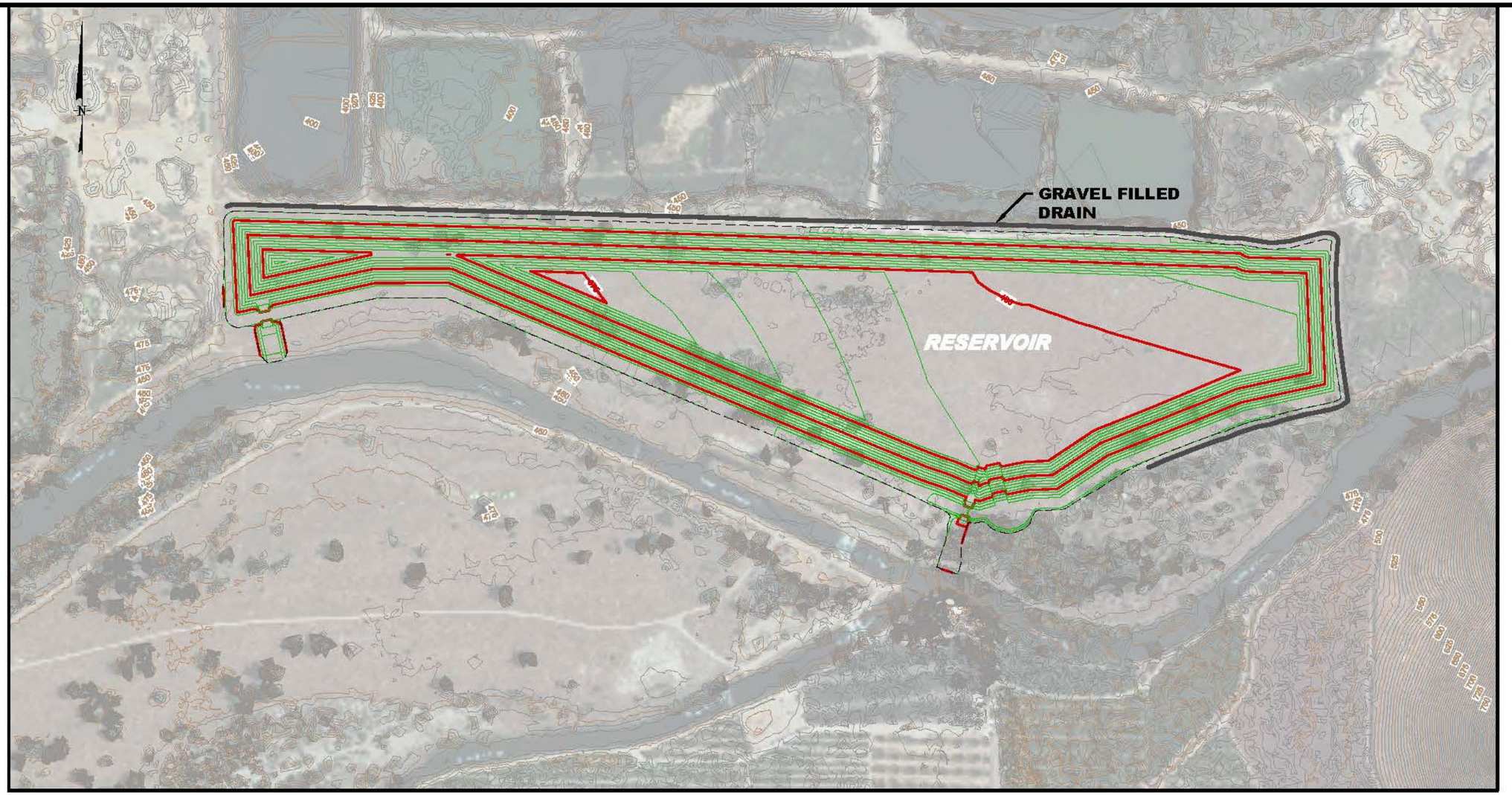
REPORT —-	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **FEMA FLOOD HAZARD ZONE**	FIGURE No. — REV A

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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-9 FEMA Flood Hazard Zone

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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-10 Existing & Proposed Site Topography

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3.10.5.6 Surface Water Quality

Surface water near the Project site is generally considered suitable for beneficial uses including municipal, domestic, agricultural and groundwater recharge purposes. Virtually all municipal and industrial water supply in the Project region is derived from groundwater and surface water is essentially used exclusively for agricultural purposes. As such, the surface water quality is classified as Class I for irrigation by the Department of Water Resources (DWR). The water is characterized by relatively low conductance and dissolved solids and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition (Luhdorff & Scalmanini, 2004)

3.10.6 Reservoir Operations

This DEIR section describes the reservoir objectives, a discussion of the initial excavation and final construction of the reservoir, as well as a description of the design of the excavation, slurry wall, and final reservoir. This section also provides the water balance analyses for both the excavation and reservoir operational stages and describes how the reservoir would be operated. The section concludes with an analysis of the water supply and flood control benefits that would be achieved. Please see the Hydrology and Water Quality Technical Study in Appendix G for additional detail.

3.10.7 Reservoir Objectives and Benefits

Once the reservoir is completed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, groundwater recharge supplies, and to provide for additional flood flow reductions by temporarily storing high flood waters. Its purpose is to provide multiple benefits including the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

Once the reservoir is constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.

The reservoir would be constructed in such a way that revenue can be obtained to offset the construction and development costs. Locating the reservoir adjacent to the Kaweah River allows for easy connection between the river and the reservoir, thus minimizing the need for pipelines. The elevation of the water surface above McKay Point in the Kaweah River would be used to divert water into the reservoir by gravity.

3.10.8 Reservoir Construction

3.10.8.7 Approach

As discussed previously, the proposed reservoir would occupy a surface area of approximately 120 acres, have an average water depth of 60- to 80-feet below the existing ground surface, and would have a total storage capacity of approximately 4,600 acre-feet (refer to Figure 3.10-8 and Figure 3.10-10). Final side slopes would be approximately 3:1, horizontal to vertical (H:V), to maximize stability and minimize bank erosion from wind, water, and waves. The upper portions of the reservoir slopes for several feet above and below the full reservoir water level would be covered with suitable riprap from natural stone sources or processed construction concrete debris to prevent wave action from eroding the surface.

3.10.8.8 Excavation

Over the estimated approximate 15- to 23-year excavation phase, excavation is expected to proceed at annual rates of up to approximately 920,000 gross tons per year of silts, sands, and gravels, although this rate will likely vary in any given year. The excavation equipment, the material processing plant and associated settling pond would be located within the reservoir perimeter as shown in Figure 3.10-11. Different areas of the excavation bottom would be lowered in stages and the process equipment relocated as appropriate. The excavated materials would be processed to produce a specified range of granular construction materials and sold. As discussed previously, the excavation would be done by West Coast Sand and Gravel (WCSG). WCSG would also receive, stockpile, and recycle concrete construction debris materials on an as needed basis.

During the initial excavation and material processing stage, an impermeable slurry wall would be constructed around the exaction area to limit the amount of groundwater flow into the excavation as excavation progresses below the water table.

The WCSG excavation phase (Figure 3.10-11) would include the following key facilities:

- A security fence that surrounds the excavation and eventual reservoir area.

- A controlled access gate along the west side of the excavation area.
- A scale hose near the entrance gate to provide for weighing recycle materials coming into the Project site and construction materials being shipped from the Project site.
- A haul truck unloading and loading area.
- Portable crusher and recycle plant.
- Portable diesel fuel tank for onsite equipment (4,000 gallon).
- An aggregated production (wash/screen) plant.
- A stockpile area, or areas.
- A slurry wall.
- A settling pond for clarifying/recycling process and wash water for reuse.

As shown on Figure 3.10-11 the excavations would occur within the footprint of the total area and be expanded and deepened over time. The initial excavation area shown in Figure 3.10-11 and Figure 3.10-12, is approximately sufficient for a 6-month supply of processed material. Typically, the side slopes of the excavation would be 1.5 to 1 (Horizontal:Vertical). It should be noted that the layout and facilities shown on the figure are for illustrative purpose and WCSG will refine and adjust these as necessary at the start of the excavation phase as onsite conditions warrant minor changes, but keeping all the operations within the excavation footprint. During excavation phase, the area would be dewatered, as needed, by a series of wells constructed within the excavation area to draw down the water table to below the excavation floor. Seepage calculations presented in the Hydrology and Water Quality Technical Study (Appendix G) indicate these extraction rates would initially be minimal and increase to their maximum as the excavation is deepened to the maximum depth:

- Initial Rate = 0 gallons per minute (gpm)
- Final Rate = 220 gpm (approximate)

The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel fill infiltration gallery along and outside of the northern border of the slurry wall as shown on Figure 3.10-8, Figure 3.10-11 and Figure 3.10-12. This groundwater pumping would therefore not result in a consumptive loss of water.

The slurry wall would be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. Construction would include the following facilities:

- A perimeter access road that would also serve as a leveling surface for the construction of the slurry wall. The road would vary in width from approximately 30- to 50-feet and be built on fill, up to 8 foot in height.
- An approximately 60- to 80-foot-deep slurry wall surrounding the excavation/reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow. As shown on Figure 3.10-13, the slurry wall would be constructed through the perimeter road and capped off with a durable gravel layer.

- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate reservoir area (Figure 3.10-13 and Figure 3.10-14).

It is anticipated construction of the slurry wall would take approximately 6 months and would include the following onsite facilities as shown on Figure 3.10-11. After completion of the slurry wall these facilities would be demobilized from the site to allow for excavation:

- Vehicle and equipment parking areas.
- A fill material stockpile area.
- Equipment storage area.
- A bentonite slurry mixing pond (see further discussion below on the slurry wall construction activities).
- A slurry wall backfill mixing area that would be moved along with the construction of the slurry wall, so it is always adjacent to the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench (Figure 3.10-13) through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above-referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the WCSG operations for processing as appropriate. The crushed concrete from offsite recycling may also be used as final riprap protection on the reservoir slopes.
- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Either suitable durable excavated granular material would be used, or suitable material would be obtained from the WCSG operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill material displaces the bentonite slurry in the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400-feet and its width is typically 3-feet.
- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it would form part of the perimeter road as shown on Figure 3.10-13.
- A road safety berm would also be constructed along the inside of the road facing the excavation area.

- As the excavation of the reservoir is deepened an access ramp as shown on Figure 3.10-14 would be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

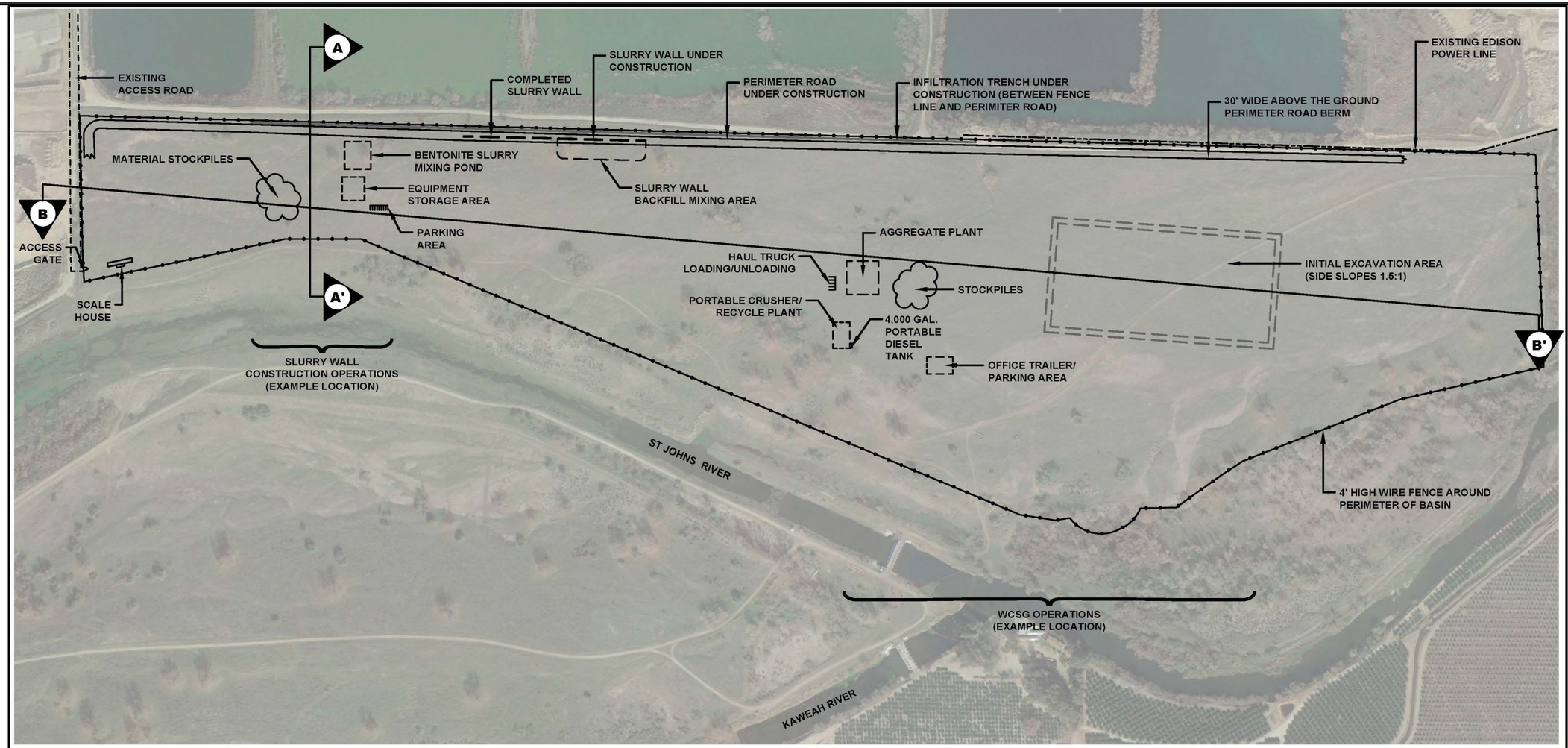
The longitudinal section through the initial and final excavation is shown on Figure 3.10-12. The excavation configuration is relatively shallow compared to its length (horizontal to vertical dimensions are of the order of 100 to 1).

The material balance during the excavation phase is as follows:

- Excavated to a 1.5 to 1 slope (Horizontal:Vertical): 16.4 million tons (11,050,000 cy).
- Use of excavated materials: Exported as product = 11.5 million tons.
- Use for 3 to 1 fill: 2.4 million tons (based on a 75% usability factor).
- Use for road construction: 0.1 million tons.
- Other uses: 2.5 million tons.

Compared to the above volumes the volume of the slurry wall is much less, at approximately 112,000 cy (0.2 million tons).

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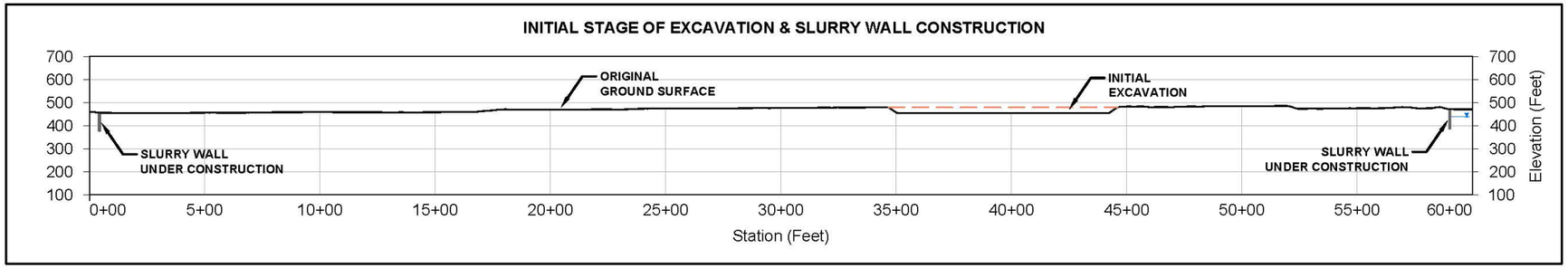
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	TITLE **INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION**	FIGURE No. / REV.

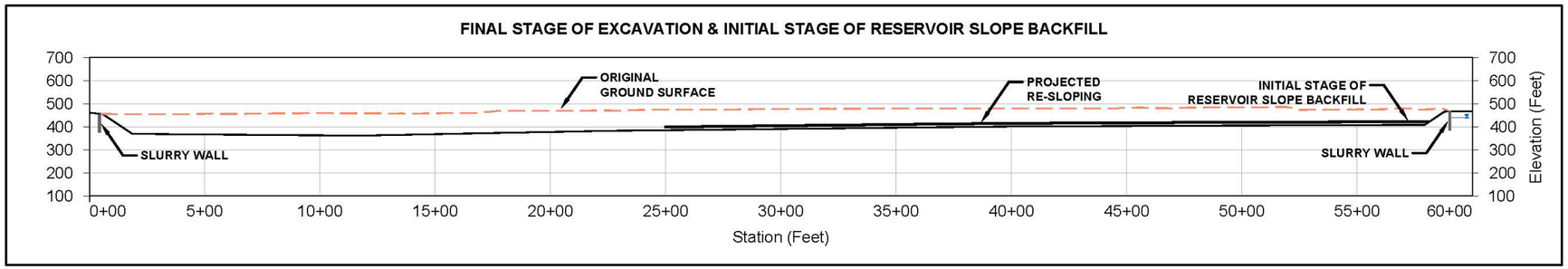
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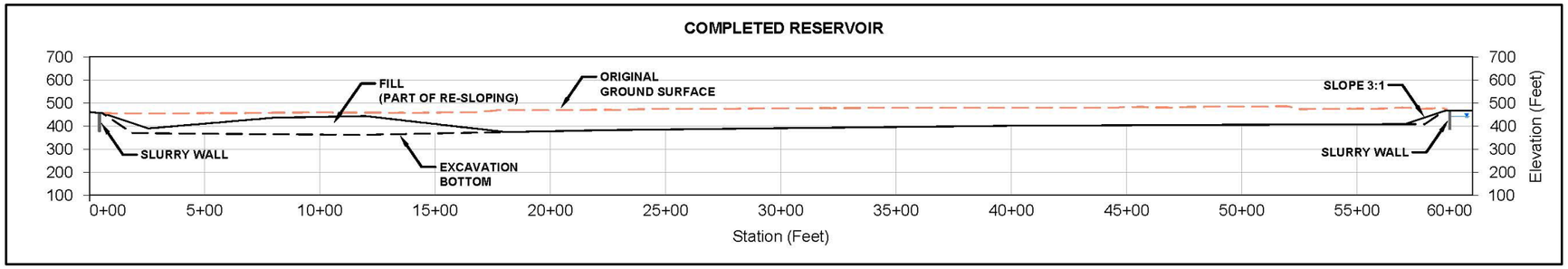
Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-11 Initial Stage of Excavation & Slurry Wall Construction

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500 FT 0 1,000 FT

REPORT
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PROJECT
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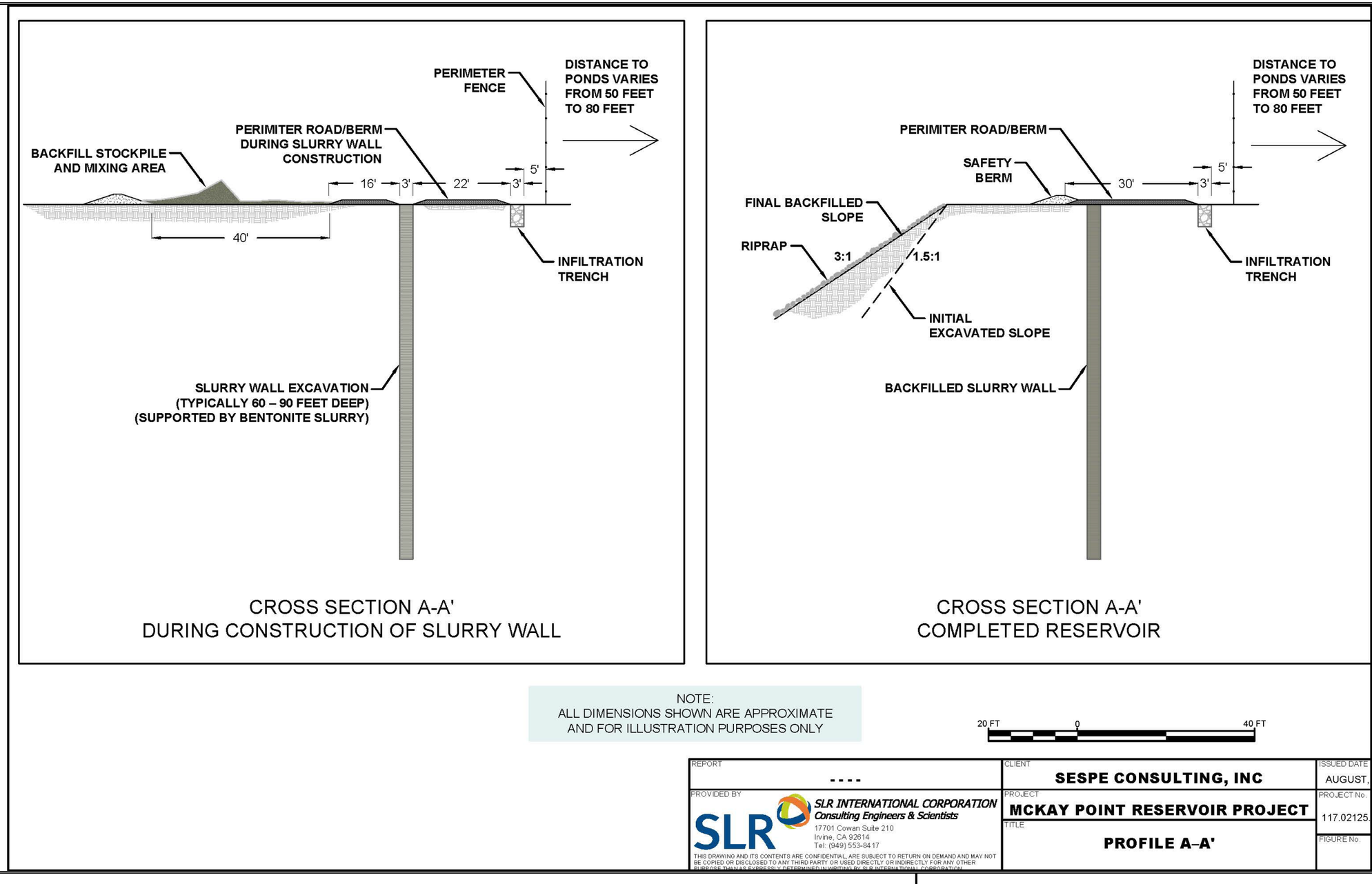
TITLE
PROFILE B–B'

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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-12 Reservoir Excavation – Design Profiles B-B

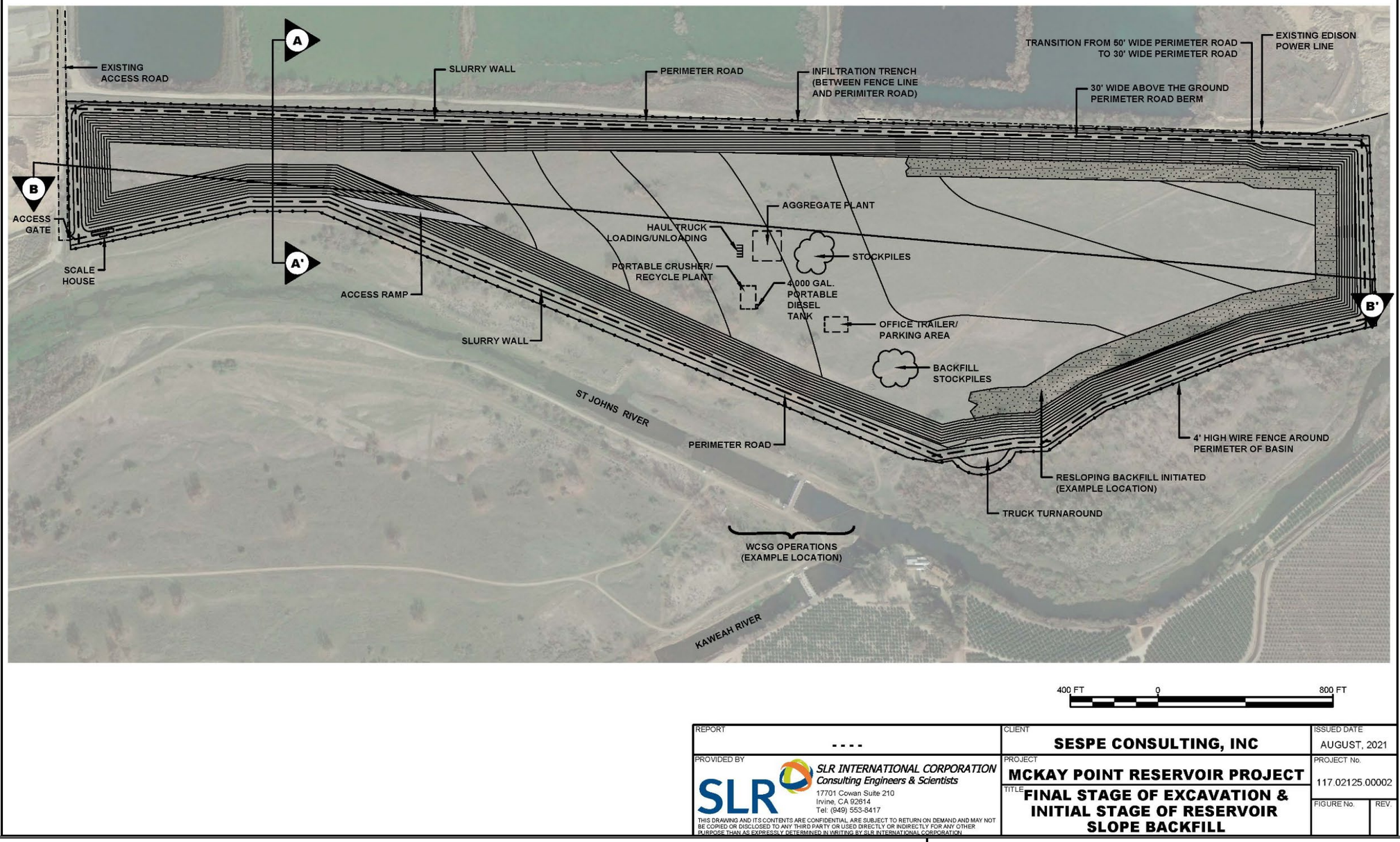
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Figure 3.10-13 Reservoir Excavation – Design Profiles A-A

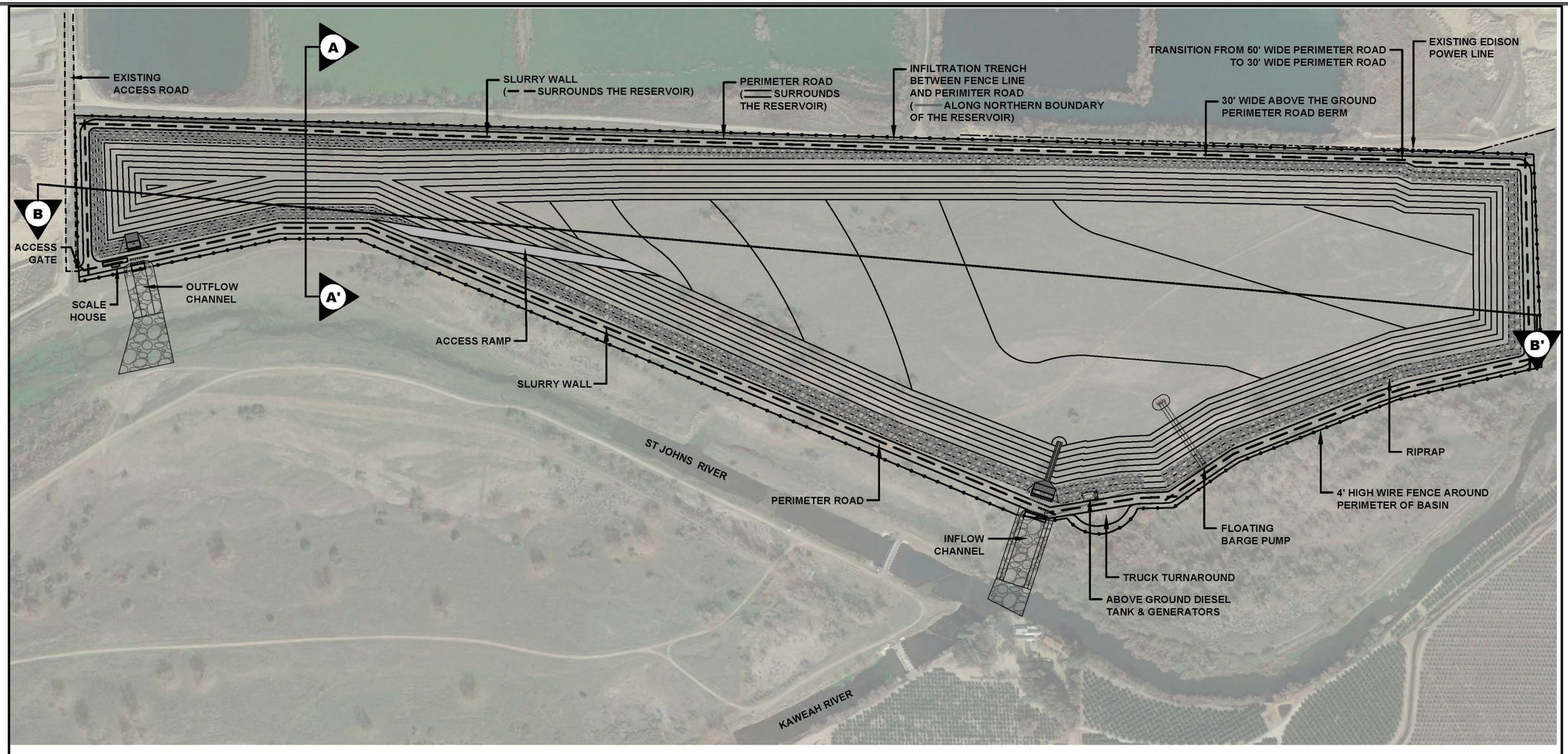
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Figure 3.10-14 Final Stage of Excavation & Initial Stage of Reservoir Slope Backfill

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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-15 Completed Reservoir

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3.10.8.9 Reservoir

Construction of the reservoir would be initiated during the final stages of the excavation and material processing Project phase, or if necessary, at a later stage. It would include two major construction activities:

- Backfilling of the excavation slopes to flatten them from 1.5 to 1 (H:V) to 3 to 1 (H:V). This is shown on Figure 3.10-12, Figure 3.10-13 and Figure 3.10-14. The backfill would be of suitable materials that has both sufficient strength and is relatively free draining. It would be constructed from the bottom up in compacted layers of suitable thickness. Figure 3.10-14 shows the first layer of the backfill being placed along the east side of the excavation.
- The second major activity would include construction of the following components (Figure 3.10-15):
    - Inflow Channel – controlled by gates.
    - Electrically operated slide gates in the Inflow Channel.
    - Inflow Chute – with rip-rap erosion protection.
    - Energy Dissipation Pool – Based upon the drilling logs, it is expected bedrock will be encountered at the proposed final elevation of the Inflow Chute. However, if the excavation does not get down to bedrock, installation of an energy dissipation pool at the base of the Inflow Chute would prevent potential scouring of the excavation slope by water entering the reservoir.
    - Floating Barge Pump and Discharge Pipeline to deliver into the Kaweah River upstream of the existing McKay Point Structures.
    - Above-Ground Diesel Tank, Generators and Generator Building.
    - Outflow Channel into the St. Johns River.
    - Electrically Operated Weir for the Outflow Channel.
    - Supervisory Control and Data Acquisition (SCADA) equipment would be used to monitor Reservoir levels and conditions, and to operate the Inflow Channel, Outflow Channel, and Floating Barge Pump.

3.10.9 Design

Conceptual level designs have been completed for the purposes of this report. These are also described in the Geology and Soils Technical Study (SLR, 2021) presented in Appendix F1, as well as Section 3.7 – Geology and Soils in the DEIR. These conceptual designs are at a level of detail that allows for the evaluation of the impacts and benefits associated with the proposed facilities. A brief discussion is also provided of the typical detailed design activities that would be performed before the facilities are constructed.

Conceptual designs of the various reservoir components discussed in Section 3.10.8.9 above are provided by Provost and Pritchard.

3.10.10 Water Balance

3.10.10.10 During Excavation

Processing would include both crushing and screening as well as washing. A total water flow rate of up to 1,500 gpm would be required for these processes. The used water would be collected and conveyed to a settling pond in the bottom of the excavation where the washed-out fine material would settle, and the clarified water would be recycled back to the processing plant with the remainder infiltrating back into groundwater under the excavation area. A much smaller amount of makeup water would be required to replace the water lost in the processing and water used for dust control at the Project site. This water would be extracted from several wells located within the excavation area, the same wells that are used to dewater the excavation. Estimated makeup water requirements (or consumptive use of water during the construction period) amount to:

- Losses in the Processing = 110 AF/year
- Settling Pond Evaporation = 1 AF/year
- Dust Control Water = 30 AF/year
- Total = 141 AF/year

The processing would also result in the accumulation of fine silt which collects in the bottom of the settling pond, some of which may be used as a soil amendment onsite in association with revegetation activities, and in construction of safety and slope stabilization berms.

During excavation the groundwater extracted to maintain dry conditions would be pumped back into the infiltration trench so would not represent a consumptive use.

3.10.10.11 During Reservoir Operations

Water balance analyses have been performed to assess how the reservoir would typically be operated and how much consumptive use is associated with these operations. Water loss would occur form:

- Evaporative loss from the moist surface of the Reservoir when it is maintained in an empty condition.
- Evaporative loss from the reservoir's surface when it is full, or partially full.

Estimated consumptive use during a year when the reservoir is operating is approximately 200 AF. During years when the reservoir is not used, net evaporation losses range from insignificant for the case where the reservoir is maintained empty by continuous pumping of the inflowing groundwater into the infiltration trench, to approximately 340 AF for the case when the reservoir is maintained in a filled condition, thus saving the pumping energy consumption.

3.10.11 Anticipated Resource Operations

3.10.11.12 Inflow Channel Management

The inflow and outflow channels would be constructed perpendicular to the Kaweah and St. Johns Rivers (Figure 3.10-8 and Figure 3.10-15). The inflow channel would provide flow into the reservoir via a reinforced concrete control structure. The control structure would include an approach apron, reinforced concrete floor, flow/level control gates, walls, and a deck on top of the structure. The existing check structures downstream of McKay Point and the proposed inlet gates would control the flow rate into the reservoir (Provost and Pritchard, 2014).

To divert river water into the reservoir, when the river water level is higher than that of the reservoir, the electrically operated weir on the inflow channel would be opened. Water would flow by gravity into the reservoir up to a maximum flow capacity of up to 3,500 cfs and an average of approximately 2,400 cfs as the reservoir fills up. Upon achieving water level equilibrium between reservoir and river, the electrically operated weir would be closed. As the level of the river recedes, the electrically operated weir would serve to hold water in the reservoir.

3.10.11.13 Outflow Channel Management

Gravity-Flow Water Delivery into The St. Johns River and Kaweah River

The gravity outflow channel for the reservoir is located downstream of the St. John's check structure (Figure 3.10-8 and Figure 3.10-15). The discharge capacity of the outlet is currently estimated to be approximately 900 cubic feet per second (cfs). The outlet could gravity drain up to approximately 1,100-acre feet of the reservoir into the St. Johns River. A proposed floating pump would empty the remaining 3,500 acre-feet stored in the reservoir. Discharge capacity of the floating pump is currently estimated to be 160 cubic feet per second and would discharge upstream of McKay's Point allowing for diversions into either the St. Johns or the Lower Kaweah River (Provost and Pritchard, 2014).

When the St. Johns River water level is lower than that of the reservoir, lowering the electrically operated weir on the outflow channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs. The average flow rate would be approximately 350 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approaches the level of the outflow channel.

The outflow channel would include a riprap or concrete apron, constructed across the riverbed of the St. Johns River when dry. This apron would prevent the potential scouring effects of the water entering the river.

The inflow channel could also be used as an outflow channel to deliver releases to the Kaweah River. It also includes riprap protection in the river. When the Kaweah River water level is lower than that of the reservoir, lowering the electrically operated weir on the inflow channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs (the inflow channel could be used for inflow or outflow). The average flow rate of return will approximate 200 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approaches the level of the inflow channel.

Water delivery in this manner is limited by the amount of water being stored at a level higher than that of the inflow channel (i.e., approximately 15-feet of additional storage). Once the level of the reservoir falls below that of the inflow channel, the floating barge pump would be used.

Pumped Water Delivery into The St. Johns and Lower Kaweah River

To release water to the St. Johns River or the Lower Kaweah River when the river water levels are higher than that of the reservoir, the floating barge pump would pump water from the reservoir, via the floating barge pump discharge, into the Kaweah River, upstream of the McKay Point structure.

3.10.11.14 Reservoir Operations

The reservoir would be operated in one of the following modes:

- Water Conservation Mode during which excess water would be stored in the reservoir for later release downstream for irrigation use or groundwater recharge.
- Flood Control Mode during which the reservoir would be used to store flood peaks to alleviate downstream flood damage.
- Dual Use Mode during which the reservoir would be operated either for conservation or flood control.

From mid-April through the end of October, the reservoir would be in Water Conservation Mode for water supply re-regulation. It is anticipated that the reservoir would fill for the final time with flood water or otherwise storable Owner entitlement. Before the end of the irrigation season the reservoir would be emptied to meet Owner irrigation demand and would remain empty for the upcoming flood season.

From the beginning of November to the end of January the reservoir would be in Flood Control Mode. Flood peaks resulting from Terminus dam release and flood flows in the unregulated Dry Creek which exceed a stipulated flow rate would be diverted into the reservoir to decrease downstream flood flows. Further discussion of this control mode is provided in Section 3.10.11.16 below.

From early February through mid-April approximately, the reservoir would be in a Dual Use Mode which involves the overlapping of two operational drivers: Flood Control and Water Conservation Modes. During this period the reservoir would be filled based on the availability of refused floodwater and the need to have an empty reservoir for flood mitigation given forecasted weather conditions.

The reservoir could be filled in a few days, depending on the flow in the Kaweah River and would decrease the peak flood flows. The quickest the reservoir could be completely dewatered would be in approximately 12 days.

3.10.11.15 Water Supply Benefits (Conservation Mode Operation)

Tulare Irrigation District (TID) has established a water balance model that simulates the irrigation water system from the outflow from Terminus Dam and Dry Creek down to the spill areas Cross Creek at Highway

43 into Tulare Lake, including supplies from, and exchanges with the Central Valley Project (CVP) and the Friant-Kern Canal, and the demands of the TID and the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC). The model incorporates the reservoir operation. This model has been used to illustrate reservoir operations for the climatic conditions observed for ten years from 2010 to 2019. The results of these simulations are shown in Figure 3.10-16 through Figure 3.10-20, and the associated agricultural water gains are summarized in Table 3.10-5[2]. These results indicate that the reservoir benefits occur when the mean annul flow conditions exceed approximately 50% of the long-term mean annual flow, or in 6 out of the 11 years simulated. In these years, it would have benefited agencies to put Kaweah water into the reservoir to be able to take Central Valley Project (CVP) water during events in which Owners' delivery systems were at capacity due to a combination of Kaweah and CVP water and there was surplus CVP water available which had to be refused to avoid additional spill on the Kaweah system.

As shown on Figure 3.10-16 for example, the solid red line indicates the period of the Flood Control Mode, the dashed red line indicates the duration of the Dual Use Mode, and the remaining period corresponds to the Conservation Mode. As noted from this figure there were no diversions for flood control purposes. During the Dual Use and Conservation Mode periods water was transferred into the reservoir in the April and May, and smaller amounts in June and August as indicated by the green dashed line. This stored water would have been used in May and again in July and August as indicated by the dotted blue line. The corresponding reservoir volumes are indicated by the solid blue line.

Table 3.10-5. Summary of Annual Agricultural Benefits

Year	Annual Precipitation at Terminus Reservoir		Annual Runoff of Kaweah River at McKay Point		Agricultural Benefit	
	Inches	% Of Long-Term Mean	Acre Feet	% Of Long-Term Mean	Additional Water Provided for D/S Use (AF)	Number Of Major Water Supply Events
2009-10	18.96	127%	454,670	122%	7,092	2
2010-11	22.38	150%	746,509	201%	6,910	2
2011-12	12.23	82%	200,737	54%	4,600	1
2012-13	6.77	45%	99,523	27%	---	---
2013-14	6.15	41%	52,893	14%	---	---
2014-15	8.97	60%	43,813	12%	---	---
2015-16	18.39	123%	287,178	77%	---	---
2016-17	19.89	133%	922,247	248%	5,842	1
2017-18	8.93	60%	202,334	54%	61	1
2018-19	17.33	116%	631,189	170%	11,445	2
AVERAGE ANNUAL	**14.94**	**100%**	**371,790**	**371,790**	**3,595**	**1.5**

[2] Note that the year 2017-18 is not plotted in the Figure 3.10-16 through Figure 3.10-20 series since the additional water provided is very small.

The benefits of the Conservation Mode operations are expected to increase for climate change scenarios. While the total annual runoff changes are minor (a reduction of up to 5%, See Section 3.10.2.3 the higher seasonal flows are projected to occur earlier in the year likely resulting in increased flood releases from Terminus Dam. With the reservoir in place these earlier releases could be stored and then used to increase the CVP water by a like amount later in the year. Furthermore, use of the reservoir will more critical since overall, less runoff will be available, making it more important to reduce any spillage of unused water by storing it in the reservoir.

3.10.11.16 Flood Management Benefits (Flood Control Mode Operations)

The Terminus Dam and Kaweah Project is operated so that flows do not exceed 5,500 cfs in the Kaweah at McKay Point to protect the downstream municipalities, rural communities, and agricultural lands in the Tulare Lakebed from flood damage (USACOE, Revised 2005). Dry Creek is the major uncontrolled tributary to the Kaweah River below Terminus Dam and upstream of the reservoir. This tributary can produce high magnitude flows that require rapid release changes from the dam if the impact is to be reduced, since there are no flood control measures in place for these flows.

Flood attenuation benefits were assessed by considering the three largest instantaneous flood peak flows that were recorded on Dry Creek between 1960 and 1997. As shown on Table 3.10-6, these include:

- December 6, 1966 (peak flow = 14,500 cfs).
- January 25, 1969 (6,070 cfs).
- January 2, 1997 (4,380 cfs).

Operations of Terminus Dam allowed for low release rates on these flood days to compensate for the higher Dry Creek flows as shown by the measured average daily flows in Table 3.10-6 (column 3). However even with these reduced discharges the flood peak flows in the Kaweah River at McKay point were still elevated as shown in column 4 of Table 3.10-6 (i.e., 4,508, 6,646 and 15,549 cfs respectively). In extremely wet years such as 2017, it would be desirable to have the reservoir absorb the Dry Creek flows so that Terminus can keep releasing as opposed to reducing releases from Terminus, thereby keeping storage available for flood inflow to Terminus (Watermaster of the Kaweah Delta).

Flood routing simulations were conducted to assess how much the reservoir, had it been in place, could have reduced these flood peaks. For these simulations it was assumed that once the Kaweah River at McKay Point flows exceed 2,500 cfs, the excess flows up to the maximum capacity of the inlet to the reservoir (3,500 cfs[3]) are diverted into the reservoir. As shown by the results listed in Table 6 (column 5), it would have been possible to reduce the flows to below approximately 3,000 cfs in the river, except for the very large December 1966 flood. Even for this event the flood peak would have been reduced to 12,472 cfs, a reduction of 3,068 cfs.

[3] This assumes the gates will all be opened to provide for the maximum inflow capacity during a flood event. During normal operations inflow rates would be less.

Figure 3.10-21 shows which day of the year the measured annual maximum flood peaks occurred in Dry Creek, and these can be considered to cover the periods during which future large floods may occur and during which the reservoir could potentially be used for flood control purposes. The solid lines in the chart indicate the approximate starts and finishes to the Flood Control Mode period that could be considered. These periods would include:

- November 1 would be the start of the flood control operations during which the reservoir would exclusively be used for flood control purposes and emptied after each flood storage event in anticipation of the next flood event. The released water could be used for recharge in a variety of basins around TID ranging from several acres to 150 acres in size.
- January 31 would be considered the end of the Flood Control Mode period.
- February 1 through April 15 would be considered a Dual Use Mode period during which water from a projected large flood would be stored in the reservoir, but after the flood the water would only be released in accordance the which agricultural demand as discussed in Section 3.10.11.15.

Table 3.10-6. Kaweah River at McKay Point – Annual Flows

Historic Flood Flow Data				**Simulated Effect of Storing Flood Flows Above 2,500 CFS[4] In Reservoir**		
Date	**Measured Instantaneous Peak Dry Creek Flow Rate (CFS)**	**Measured Average Same Day Daily Outflow from Terminus Dam (CFS)[5]**	**Calculated Maximum Instantaneous Peak Flow in Kaweah at McKay Point (CFS)[6]**	**Reduced Flood Flows to Downstream of Reservoir (CFS)[7]**	**Reduction In Kaweah River at McKay Point Flow by Storing Flood Water in The Reservoir (CFS)**	**Reservoir Storage Untilized (AF)**
December 6, 1966	14,500	1,040	15,540	12,472	3,068[8]	4,600
January 25, 1969	6,070	576	6,646	3,146	3,500	2,429
January 2, 1997	4,380	128	4,508	2,628	1,880	939

The flood routing was repeated for the estimated 10-year to 100-year flood peaks at McKay Point developed by FEMA and discussed in Section 3.10.5.5 above. The results are provided in Table 3.10-7 showing the reductions that could be achieved. It is evident that the reservoir could reduce flood peaks to below the target 5,500 cfs for flood events up to approximately the one in 50-year event. For larger

[4] The 2,500 cfs has been set as a threshold above which water is diverted into the reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.

[5] Based on the difference between the measured average daily flows at "Dry Creek" from "Total Kaweah River at McKay Point" as recorded in the Water Master Reports.

[6] Sum of the measured instantaneous Dry Creek flow and the average daily outflow from the Terminus Dam.

[7] Based on flood routing through the reservoir.

[8] It was not possible to reduce the flood peak by the capacity of the inlet structure because the reservoir was filled with flood water before the actual peak river flow occurred.

floods, it would still be possible to reduce the flood peaks, however it would not be possible to meet the 5,500 cfs target at McKay Point.

In conclusion the reservoir would have the ability to capture some of the floodwater from large floods in Dry Creek, where it would be held until it can be safely returned to the Kaweah and St. Johns rivers for direct use or recharge. The reservoir has the capacity to reduce flood peak up to approximately the 50-year return period event to below the target 5,5000 cfs. There would still be a benefit during still larger floods in reducing the peak flow rates.

Table 3.10-7. Simulated Effect of Storing Flood Flows Above 2,500 CFS[9] in Reservoir

Date	Estimated Maximum Instantaneous Peak Flow in Kaweah at McKay Point (CFS)[10]	Reduced Flood Flows to Downstream of Reservoir (CFS)	Reduction In Kaweah River at McKay Point Flow by Storing Flood Water in the Reservoir (CFS)	Reservoir Storage Untilized (AF)
100-year	18,456	16,706	1,750	4,600
50-year	8,725	5,225	3,500	3,998
10-year	4,400	2,500	1,900	955

Since climate change is expected to result in increased intensities of flood events, more frequent flood events, and earlier arrival of high winter flows. Under these conditions the reservoir would provide for increased flood control benefits. For example, as discussed in Section 3.10.2.3, flood peaks for the current frequencies are expected to occur almost twice as often. This would mean that instead of the reservoir contribution to flood reductions for storms exceeding the 10-year event, it would be more useful and would be able to provide for reductions in flood flows for storms exceeding the 5-year event. This means that over a Project life of 50-year say, instead of the reservoir being used approximately 5 times, it would be used approximately 10 times.

3.10.11.17 Project Design Features and Environmental Protection Measures

The following provides a brief summary of the best management practices (BMPs) and Project design features that would be implemented to minimize impacts to hydrology and water quality.

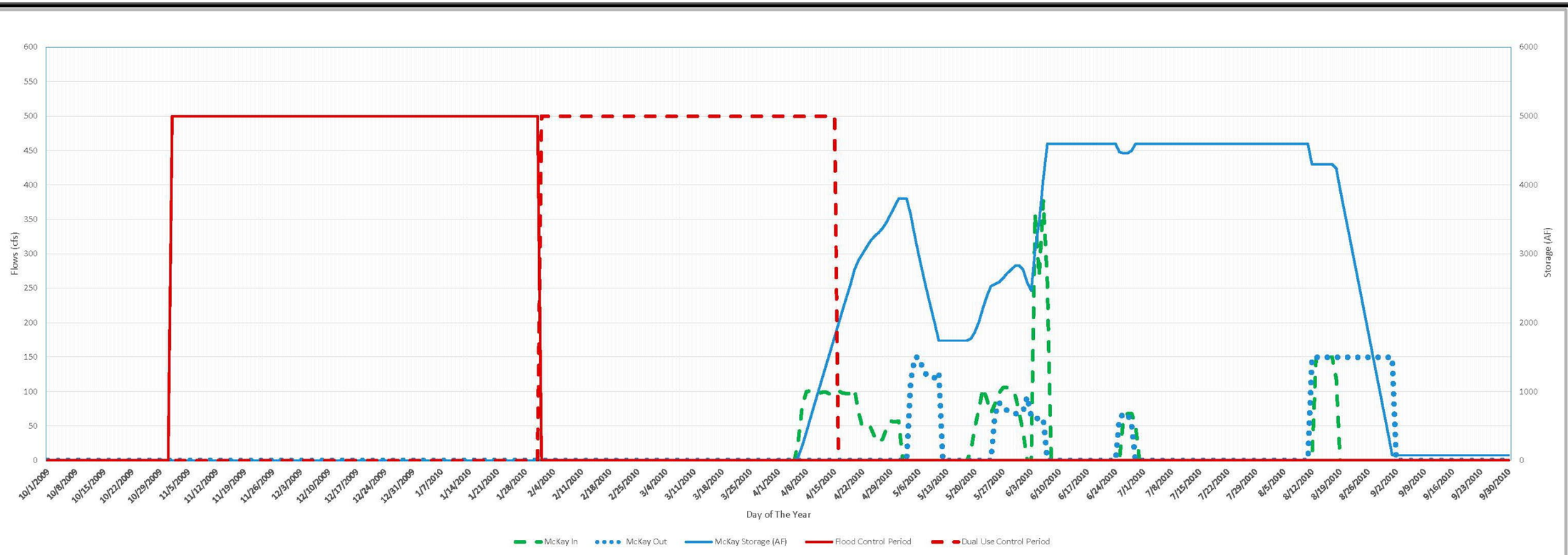
- The Project would comply with the BMPs and requirements identified in the site-specific Storm Water Pollution Prevention Plan (SWPPP); WDRs; Streambed Alteration Agreement; Hazardous Materials Business Plan (HMBP); Spill Prevention, Control and Countermeasure (SPCC) Plan; and the Surface Mining and Reclamation Act (SMARA) Reclamation Plan.

[9] The 3,500 cfs has been set as a threshold above which water is diverted into the Reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.

[10] Based on FEMA estimates.

- BMPs may include:
    - Energy dissipaters;
    - Sediment catchment basins/sumps;
    - Rock dams;
    - Berms;
    - Employee training;
    - Documented operating, inspection and maintenance procedures; and
    - General housekeeping.
- Runoff would be directed into the reservoir or local detention areas to the extent practical.
- The perimeter road would be graded to direct runoff into the reservoir or onsite detention areas. The road would be inspected and maintained regularly for erosion and sediment control.
- The use of hazardous materials at the Project site would be limited and include mainly fuels, lubricants and fluids associated with equipment and vehicles.
- During the operations period, all vehicles would be serviced and fueled offsite.
- During reservoir excavation and construction, fueling and minor service of vehicles (haul trucks, service vehicles and earth-moving equipment) would be conducted in a designated area where the receipt, storage, handling, use and disposition of these materials would be performed in compliance with the requirements of an approved HMBP, Hazardous Materials Inventory, and SWPPP. Fuel would be brought in by truck and any major servicing to vehicles and equipment would be conducted off-site.
- The 10,000-gallon aboveground storage tank (AST) used during reservoir operations for the operation of the floating pump would have secondary containment and be in compliance with the SPCC Plan.
- The AST would not be used for fueling of vehicles or equipment.
- Filling of the AST would only occur in a designated area underlain by concrete paving to facilitate spill cleanup and to inhibit migration of fuel contaminants into the soil column.
- The AST would not be located in an area predicted to be inundated by a 100-year flood.
- During the time water is stored in the reservoir, sufficient time would be allowed for settlement of sediments to occur to assure that the discharged water does not degrade water quality of the rivers with respect to suspended sediment and turbidity.
- Large portions of the water for discharge would be drawn from the upper portions of the water column (where the turbidity would be the lowest) by using a floating pump.
- Monitoring and reporting would be conducted as required by permit and regulatory requirements.
- The outflow and inflow channels would include rip rap or concrete aprons to prevent potential scouring effects.

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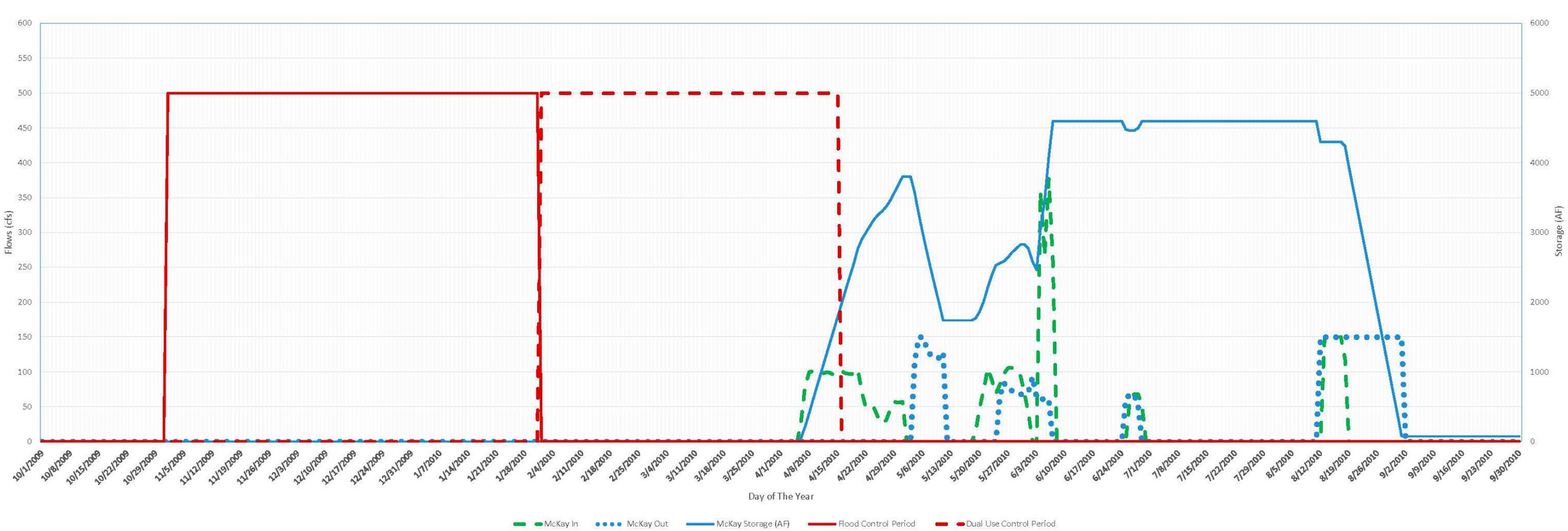


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Figure 3.10-16 Example Operation in Water Supply Mode in 2009-2010

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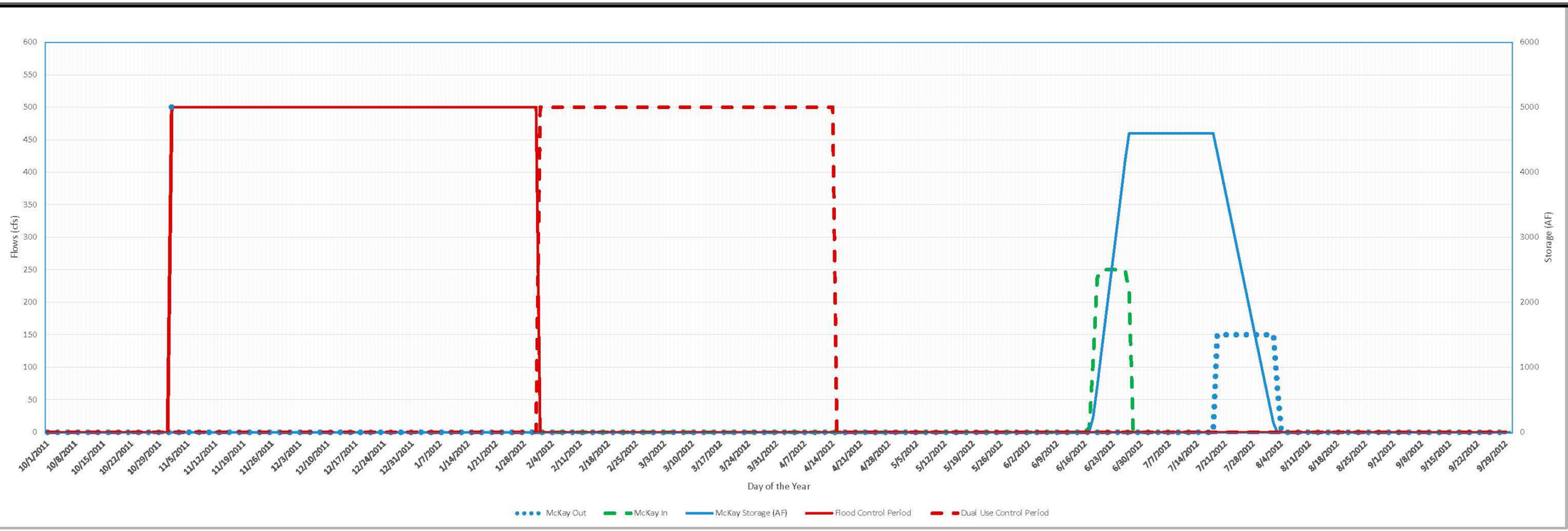


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Figure 3.10-17 Example Operation in Water Supply Mode in 2010-2011

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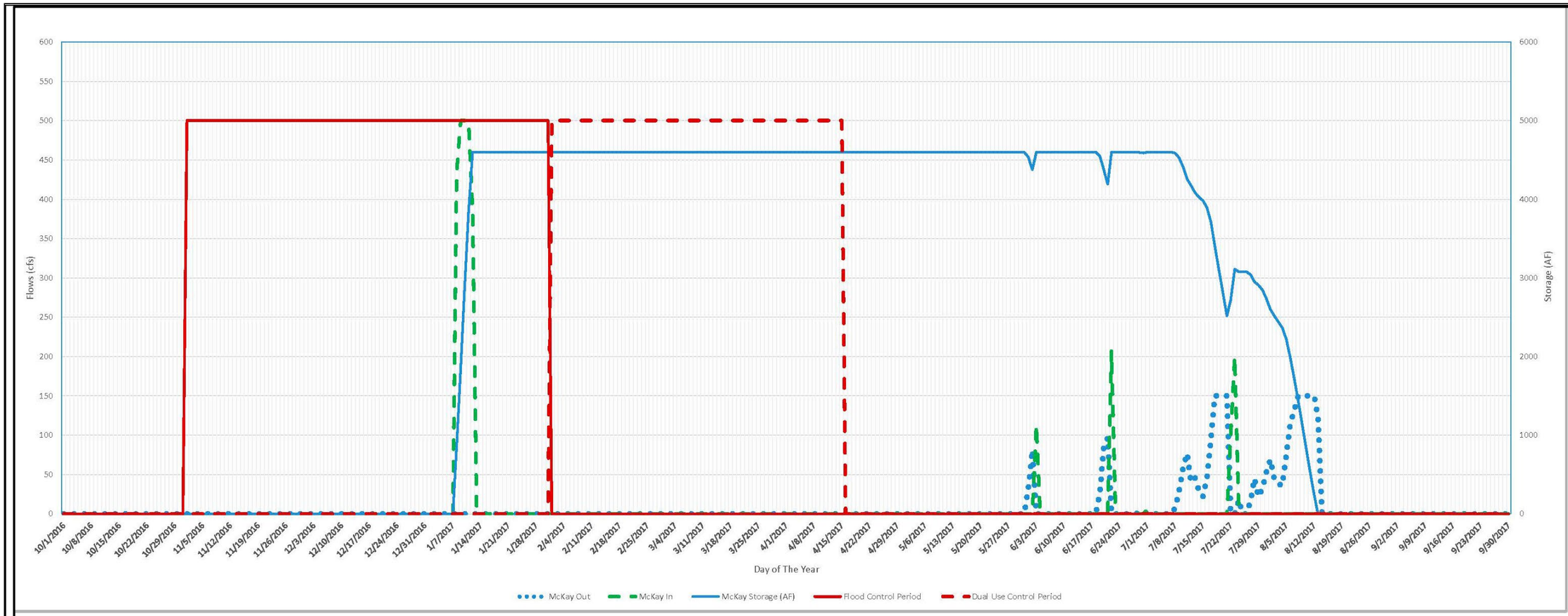


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Figure 3.10-18 Example Operation in Water Supply Mode in 2011-2012

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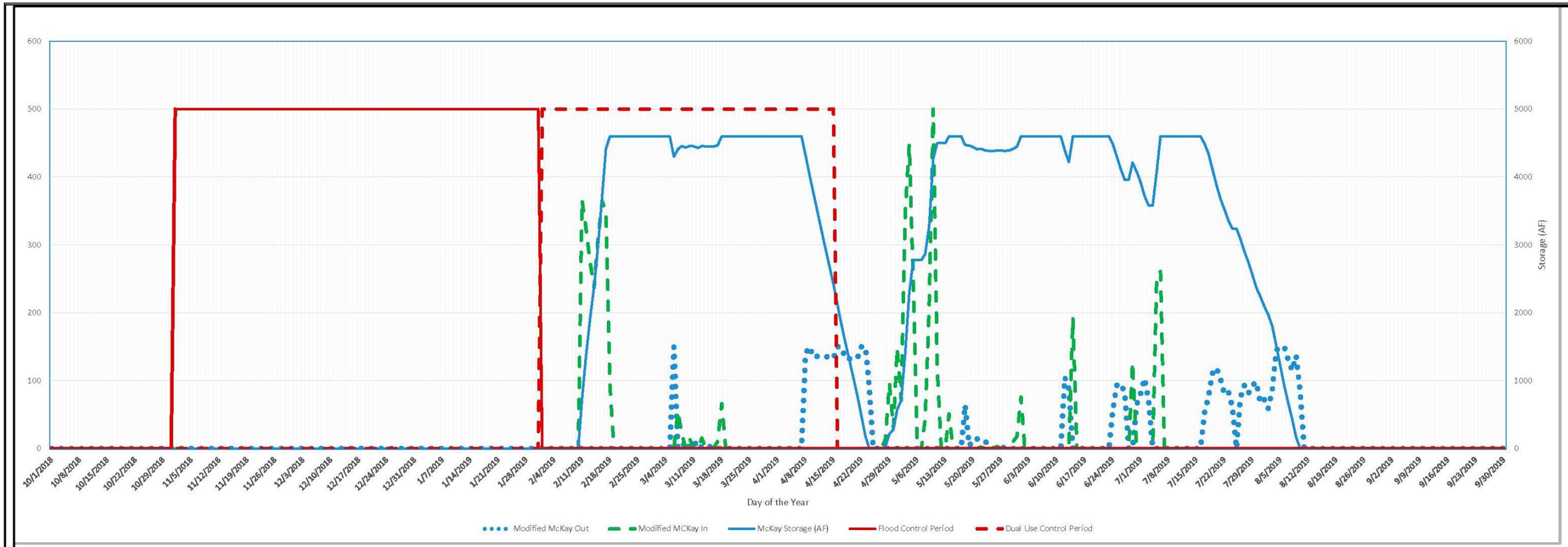
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		TITLE EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2016-2017	FIGURE No. / REV.

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Figure 3.10-19 Example Operation in Water Supply Mode in 2016-2017

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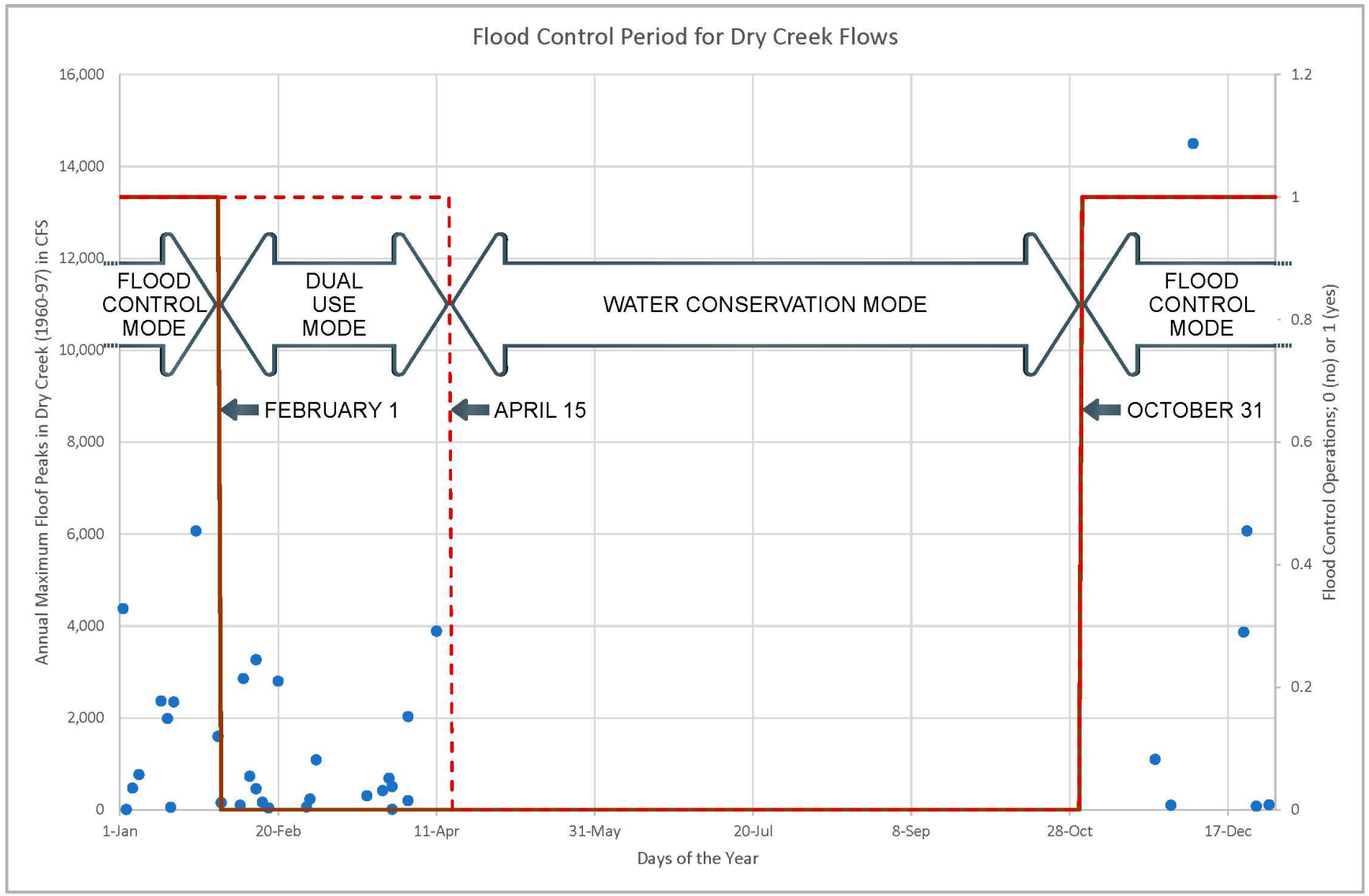


REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
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Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-20 Example Operation in Water Supply Mode in 2018-2019

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THIS DRAWING AND ITS CONTENTS ARE CONFIDENTIAL, ARE SUBJECT TO RETURN ON DEMAND AND MAY NOT BE COPIED OR DISCLOSED TO ANY THIRD PARTY OR USED DIRECTLY OR INDIRECTLY FOR ANY OTHER PURPOSE THAN AS EXPRESSLY DETERMINED IN WRITING BY SLR INTERNATIONAL CORPORATION	TITLE: ANNUAL MAXIMUM DAILY FLOOD FLOWS IN DRY CREEK ILLUSTRATING RESERVOIR OPERATING MODES	FIGURE No.: / REV.:

Source: SLR International Corporation, Hydrology and Water Quality Technical Study (2022)

Figure 3.10-21 Annual Max Daily Flood Flows in Dry Creek – Reservoir Op. Modes

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3.10.12 Project-Level Impacts and Mitigation Measures

3.10.12.18 Water Quality Standards

Impact Statement

Impact HWQ-1: *Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?* **(CEQA Guidelines Threshold (a))**

Impact Analysis

The potential for water quality impacts to be caused by the Project due to the use and storage of fuels and chemicals, and possibly due to runoff from the Project Area, is evaluated below.

Any unacceptable impacts due to suspended sediment entrainment in surface water would be prevented by the appropriate engineering measures and regulated under the State Water Resources Control Board's (SWRCB's) General Storm Water Permit. These measures are discussed further below.

The use of hazardous materials during reservoir excavation, construction and operations would mainly include petroleum fuels, lubricants, and fluids associated with vehicles and equipment operating onsite. As discussed in Section 3.10.5, a variety of management practices and Project design features would be implemented that would minimize the possibility of significant releases of these substances.

Water quality could be impacted by the use and storage of hazardous materials at the Project site, possible storm water runoff from the site, discharges from the reservoir that could contain suspended solids, and discharges of groundwater that contain naturally-occurring metals (e.g., iron, manganese) at concentrations that could cause exceedance of water quality objectives in the river(s). These potential impacts are evaluated below.

Use Of Fuels and Other Chemicals for Equipment Operation and Maintenance

The use of hazardous materials during reservoir excavation and construction operations would mainly include fuels, lubricants, and fluids associated with vehicles and equipment. During reservoir excavation and construction, fueling and minor service of vehicles (haul trucks, service vehicles and earth-moving equipment) would be conducted in a designated area where the receipt, storage, handling, use and disposition of these materials would be performed in compliance with applicable regulatory requirements (refer to Section 3.6 – Hazards and Hazardous Materials). Any spill from vehicles or equipment would likely be small and would be promptly and easily cleaned up and disposed of in accordance with State and County regulations. Therefore, during excavation and construction, the Project would result in less than significant impacts with respect to the use of hazardous materials.

Reservoir construction would include the installation of an AST (approximately 10,000 gallons), diesel generators, and a generator building near the inflow channel. Except for the diesel and fluids stored in or on the vehicles and equipment, and, during operations, stored in the AST, significant amounts of hazardous materials would not be stored within the Project site. The AST would be used to fuel the

generator powering the floating barge pump, and would not be used for fueling of vehicles or equipment. Therefore, dispenser-related spillage would not occur.

The AST would be dual-walled for leak protection. Filling of the AST would only occur in a designated area underlain by concrete paving to facilitate spill cleanup and to inhibit migration of fuel contaminants into the soil column. Because the AST capacity is greater than 1,320 gallons, the Owners would be required to prepare and implement a SPCC Plan, which describes fuel storage, transfer, and spill avoidance, and spill response procedures (also refer to Section 3.6 – Hazards and Hazardous Materials).

Because trucks and equipment would be fueled and maintained offsite during the reservoir operational period, and the AST would be constructed, operated, and maintained in accordance with existing regulations, the probability of an onsite spill would be minimized. Additionally, the AST would not be in an area predicted to be inundated by a 100-year flood, as described in subsequent sections, and as shown on Figure 3.10-9. Therefore, damage of the AST because of flooding is not anticipated. Therefore, for the reasons outlined above, the Project would result in less than significant impacts with respect to the use of hazardous materials.

Storm Water Runoff

The SWRCB has jurisdiction throughout California. Created by the State Legislature in 1967, the SWRCB protects water quality by setting statewide policy, coordinating, and supporting the Regional Water Board efforts, and reviewing petitions that contest Regional Board actions. Nine Regional Water Quality Control Boards exercise rule making and regulatory activities by basins. As discussed previously, Tulare County (including the Project site) falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB). As such, the Project is subject to the requirements of the *Water Quality Control Plan for the Tulare Lake Basin*, revised January 2004.

The SWRCB issued a statewide Industrial General Storm Water Permit Industrial General Permit (IGP) that applies to all industrial storm water discharges. SWRCB adopted a new Permit that took effect July 1, 2020.

The Owners would obtain coverage under the IGP, as required. Storm water runoff from the Project site would be managed through proper implementation of BMPs (sediment and erosion control measures) as described in the SWPPP. The primary objective of the SWPPP and BMPs is to ensure that polluted runoff, including runoff containing suspended solids and sediment, does not leave the Project site and degrade other water bodies. The SWPPP would contain descriptions of aspects such as potential discharge areas, significant materials, and BMPs. BMPs also include non-structural elements such as employee training, documented operating procedures, and general housekeeping. Compliance with applicable storm water regulations will prevent impacts to water quality.

The Project is designed to divert water from the Kaweah River and store this water for later release downstream for use by irrigation water customers. The Project design incorporates engineering measures

such as concrete slabs and riprap to prevent erosion and entrainment of suspended solids at the inlets and outlets to the reservoir where higher water velocities are expected to occur. The Project would not create large areas of impermeable surfaces and would not result in increased rates of surface runoff. In fact, the Project would serve to capture rainfall, thereby reducing surface runoff compared to baseline conditions. Geologic materials exposed in the reservoir would consist of natural sediments, which do not contain chemical constituents capable of degrading surface or groundwater. Process water would not be generated or discharged to groundwater, or surface water as part of the Project. Therefore, the Project would not produce additional runoff or convey pollutants to surrounding waterbodies.

During reservoir construction, energy dissipaters would be installed, such as sediment catchment basins or sumps, rock dams, and berms within the pit. These measures would serve to reduce erosion, trap sediment, and minimize the potential for off-site transport of pollutants. During the excavation phase of the construction, activities would take place inside the excavation itself, thereby preventing any runoff from these activities from entering the rivers. Once the reservoir construction has been completed, and the Project site reclaimed in accordance with a County-approved Reclamation Plan, reservoir operations would not result in additional disturbed areas. Operations would minimize the extent of disturbed areas. As such, discharges of storm water runoff from the Project site would decrease, and runoff would be directed into the reservoir itself or local detention areas to the extent practical. As a result, storm water runoff from the Project site would decrease significantly as runoff would be directed into the reservoir.

The final side slopes for the reservoir would be protected from erosion by wind-wave action by the placement of suitable granular material including riprap to armor these surfaces. The perimeter road would also be graded to direct runoff into the reservoir or onsite detention areas instead of toward the rivers or adjacent lands. In addition, the road would continue to be inspected and maintained regularly. Inspections of the road condition and the status of sediment and erosion control measures would be integrated with regular required storm water inspection pursuant to the IGP.

In summary, the Project is not expected to cause increased siltation or degrade water quality of surface waters or groundwater, or cause violations of water quality criteria. The Project site would be subject to conditions of the IGP, including provisions for inspections, monitoring, and reporting. The Project involves creation of a reservoir, which is a topographic depression that would reduce runoff discharges from the Project site by redirecting those flows into the reservoir. As a result of proper implementation of sediment and erosion control measures, the Project is not expected to exacerbate the pollutant load of St. Johns or Kaweah Rivers. Therefore, the Project would result in less than significant impacts related to storm water runoff.

Reservoir Discharge

During operations, the Owners may choose to fill the reservoir during high river flow conditions, which may occur in response to periods of extraordinary precipitation. High flow conditions would naturally entrain soil particles from the banks or bottom of the Kaweah River. As a result, water diverted into the reservoir may contain elevated concentrations of sediments. Releases from the reservoir containing

excessive sediments could violate the Basin Plan WQOs, and could adversely affect beneficial uses that are designated for the St. Johns River.

Once water has been diverted into the reservoir, it will be necessary to ensure that the discharged water meets the Water Quality Objectives (WQOs) with respect to suspended sediment and turbidity. The minimization of discharged sediments would be achieved with the settlement of suspended materials; and by first drawing water from the top of the reservoir, via the outflow chutes, then by use of the floating pump to draw water from the upper portions of the water column, where the turbidity will be lowest. During the time water is stored within the reservoir, sufficient time will be allowed for settlement of sediments to occur to assure that the discharged water will meet the WQOs with respect to suspended sediment and turbidity.

Conclusion

As discussed above, the Project is not expected to cause increased siltation or degrade water quality of surface waters or groundwater, or cause violations of water quality criteria. As applicable the Project site would be subject to conditions of the SWPPP and SPCC Plan, including provisions for inspections, monitoring, and reporting. The Project involves creation of a reservoir, which is a topographic depression that will reduce runoff discharges from the Project site and vicinity. As a result of proper implementation of sediment and erosion control measures, the Project is not expected to exacerbate the pollutant load of St. Johns or Kaweah Rivers.

If needed, major maintenance of the trucks and equipment would be conducted at approved facilities located outside of the Project area, both during the excavation construction and operational phases. During the excavation- and construction-related activities of the reservoir, trucks and equipment would be fueled onsite with mobile fuel trucks within the excavation area. Since the AST would be constructed, operated, and maintained in accordance with applicable regulations, the probability of an onsite spill is minimized.

As a result of the factors discussed above, with operational controls and WDRs that protect surface and groundwater quality, the Project is not expected to violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Impacts would be less than significant with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Less than significant.

3.10.12.19 Groundwater

Impact Statement

Impact HWQ-2: *Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?* **(CEQA Guidelines Threshold (b))**

Impact Analysis

Groundwater supplies could potentially be impacted as a result of the Project. These potential impacts are evaluated below.

Slurry Wall

As noted above, a slurry wall installed during the initial phases of reservoir excavation (i.e., prior to excavation reaching groundwater), before the construction of the reservoir, would decrease the flux of groundwater between the reservoir/excavation pit and surrounding aquifer. Slurry walls are underground walls made of bentonite (clay) mixtures that are installed to inhibit groundwater flow and once installed, would keep the excavation in a relatively dry condition. In this case, the slurry wall would be installed around the reservoir perimeter to decrease groundwater seepage flowing into the reservoir during excavation and construction phases, and to keep the reservoir in a relatively dry condition when not being used for storage. Section 3.10.6 through 3.10.11 provides a detailed discussion on the construction and purpose of the slurry wall.

The slurry wall would be a permanent fixture of the reservoir and would serve as an essential feature of reservoir operations to achieve the following:

- Assist in maintaining dewatered storage capacity to receive surface water diversions;
- Keep groundwater out of the Reservoir to minimize aquifer impacts and provide maximum space to receive Kaweah River water; and
- Inhibit losses of surface water stored in the reservoir to the surrounding aquifer when the reservoir is full.

It is recognized that even with the slurry wall installed there will be groundwater seepage into the reservoir from under the slurry wall when the reservoir is empty and some leakage of stored water to groundwater when the reservoir is full. Management of this seepage/leakage is described in Section 3.10.6 through 3.10.11 and in the discussion below.

Groundwater Flow, Seepage Rate and Supply

Dry reservoir conditions would exist during construction after slurry wall installation. Dry reservoir conditions would also exist during reservoir operations during time periods in which the Owners wish to reserve storage for anticipated dam releases or precipitation events. Under these conditions, the Owners would intend to keep groundwater out of the reservoir.

The slurry wall would not completely eliminate flow of groundwater into the reservoir when the Owners wish to keep it dry. Dewatering will still be required when the bottom of the reservoir is at a lower elevation than the surrounding groundwater, creating a hydraulic gradient toward the reservoir.

Therefore, some groundwater seepage into the reservoir would occur under the slurry wall and SLR estimated the rate of groundwater seepage into the site during excavation at approximately 220 gallons per minute (gpm) when the Reservoir is being kept dry (Attachment D of the Hydrology and Water Quality Technical Study located in Appendix G of the DEIR). These estimates were calculated using the finite element program SEEP/W and site-specific soil and groundwater conditions. The modeling represents maximum inflow conditions in that dry conditions at the maximum extent of excavation were modeled.

Resulting groundwater seepage into the reservoir with a slurry wall is estimated to be 220 gpm, which is the maximum estimated range of groundwater seepage into the reservoir. This would occur at the final extent of the Project's excavation and construction when the reservoir is being kept empty. At the end of reservoir excavation and construction, the bottom of the reservoir would be approximately 60- to 75-feet bgs, the maximum amount of reservoir wall would be exposed, and the maximum amount of groundwater head surrounding the reservoir would be realized.

Reservoir operations do not involve the storage of groundwater. Therefore, when dry reservoir conditions are desired, any water present as a result of rainfall, storm water runoff, or seepage would be captured in a sump at a designated location within the reservoir and pumped back and reintroduced into the local aquifer via an infiltration trench. The infiltration gallery would consist of gravel-filled ditches with perforated pipe and be located along the northern boundary of the reservoir, between the slurry wall and the adjacent CEMEX property (Figure 3.10-10).

As previously noted, groundwater in the immediate vicinity of the Project site generally flows toward the northwest (Schmidt, 2012). Based on this gradient, the Kaweah River (Main and Lower) and St. Johns River appear to contribute to groundwater recharge, and together with groundwater inflow from the east appear to be primary factors in driving the direction of groundwater flow.

After the slurry wall is installed, the general direction of groundwater flow is not expected to change since it is driven by recharge from the east and from the river channels. This northwest flow is expected to flow around the slurry wall to the north and south. This is not expected to significantly inhibit groundwater flow to areas west or north (downgradient) of the project site because the abundant coarse-grained soils of the alluvium and the fractured rock of the aquifer in the area is expected to accommodate flow around (to the north and south) and underneath the Project site (refer to Attachment A in the Hydrology and Water Quality Technical Study located in Appendix G of the DEIR).

Groundwater is not expected to significantly mound (accumulate vertically) on the upgradient side of the Site or cause a "shadow" of depressed groundwater levels downgradient of the Project site. Parcels located adjacent west of the Project site would continue to receive recharge as groundwater flows around the slurry wall.

As stated above, seepage into the excavation would be collected and infiltrated back into to the aquifer, so the seepage will not constitute a loss and is not expected to affect groundwater supplies or levels.

The St. Johns and Kaweah Rivers create a significant hydraulic divide in the groundwater system. In general, any changes occurring on one side of a hydraulic divide are unlikely to affect conditions on the other side. Therefore, it is unlikely that potential groundwater related impacts, if any, would occur at sites located south of the St. Johns River or east of the Kaweah River. Because of the hydraulic divide and because the Project would not affect the fractured rock groundwater unit, groundwater levels in wells south of the Kaweah River such as the Lemon Cove municipal supply well are not expected to be affected by the Project.

The reservoir, when pumped out, is not expected to impact the Minimum Threshold and Measurable Objective groundwater levels that have been established for Well KSB-2822 (also referred to as 18S27E05J001M, located between the St. Johns and Kaweah Rivers – Figure 3.10-5). The modeled changes to the groundwater levels around the outside of the slurry wall (refer to Attachment D in the Hydrology and Water Quality Technical Study located in Appendix G) which indicates these are insignificant (i.e., less than 3-feet).

Operational Reservoir Conditions & Evaporation

An estimated approximately 200 AF per year (approximately 124 gpm as a continuous flow) of net evaporation would occur during a typical year of operation during which the reservoir remains full or partially full, during the months of May through September and for short periods of days or weeks in the November through January period when used for flood control (see Section 3.10.10.11). This compares to the additional annual average 3,129 AF of additional agricultural water that would be made available by operating the reservoir (Section 3.10.11.14). This evaporation rate amounts to 6% of the added water generated.

During reservoir operations, when the reservoir is filled with diverted water, the water surface elevation would be up to approximately 460-feet elevation which exceeds the groundwater elevation at several locations within the reservoir footprint. Although the slurry wall would have been installed to inhibit groundwater flux into and out of the reservoir, aquifer recharge would occur under full reservoir conditions because the reservoir level would be higher than the surrounding groundwater. The recharge rate is expected to be minor due to the presence of the low-permeability slurry wall. The recharge volume depends on how much time the reservoir water level remains above the groundwater levels in the vicinity. This recharge volume is not further evaluated because it is small and, in any event, constitutes a source of groundwater recharge no more than the recharge from the rivers.

Water Consumption

During site excavation, water would primarily be utilized for material processing (i.e., washing aggregate material in the plant[s]) and for dust control within the McKay Point site. No landscaping that would

require irrigation is proposed onsite. Water would be provided by a water well, proposed to be installed in the northern portion of the McKay Point site (see Figure 2-5).

As discussed above, it is estimated that the Project would utilize approximately to 114 AF per year for materials processing and dust control purposes during reservoir excavation and construction. Water for these purposes would be obtained from wells installed in the bottom of the excavation. These wells would also be used for maintaining the excavation in a dry enough state for the excavation and processing activities. These consumptive uses from the existing source constitute a minimal impact over baseline conditions. These consumptive uses are not expected to affect groundwater levels or supplies in the Project site vicinity.

Conclusion

Negligible groundwater losses are anticipated. The slurry wall would be in place, which would form a flow barrier in the alluvial groundwater system. As a result, in the Project site area, groundwater flow directions would change as groundwater flows around the slurry wall through the alluvium and fractured rocks that surround the Project. Any nominal quantity of groundwater that incidentally seeps into the excavation through the slurry wall would promptly be collected and re-infiltrated back to the aquifer using infiltration drains as discussed above. The infiltration galleries would be located north of the excavation, which would minimize changes to the current direction of groundwater flow in this area. Because recharge would not be significantly interrupted and offsite groundwater elevations are not expected to change noticeably, the Project would therefore result in less than significant impacts.

Reservoir operations are not expected to result in less impact to groundwater than the excavation and construction phases described above. The slurry wall would reduce impacts to groundwater supply by inhibiting groundwater from entering the reservoir, where it would be subjected to evaporation. Seepage into the reservoir through the slurry wall during dry-reservoir periods would be promptly returned to the aquifer. For these reasons, the Project, including reservoir operations, are considered less than significant impacts.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.10.12.20 Erosion and Siltation

Impact Statement

Impact HWQ-3: *Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

I. result in substantial erosion or siltation on- or offsite;

II. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

III. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

IV. *impede or redirect flood flows?* **(CEQA Guidelines Threshold (c))**

Impact Analysis

Erosion Impacts

This section describes an evaluation of the potential for drainage pattern changes to cause erosion or siltation impacts. Drainage system associated with the Project includes installation and use of the inlet and outlet channels. As described above, the Project involves creation of a topographic depression that will capture precipitation and possibly some storm water runoff. However, there are no identifiable creeks or water bodies that would be disturbed by the Project. The Project would not involve placing structures in the St. Johns or Kaweah River channels. The only changes to the river channels would be placement of riprap at the inflow and outflow channels, and construction of the inflow and outflow channels. The riprap would be placed below the elevation of and on the banks of the main river channel and on the banks and floor of the inflow and outflow channels. The inflow/outflow channels would also be set back from the main river channel. As such, these structures are designed to avoid impedance of river flows or drainage impacts.

To evaluate scouring, SLR reviewed historical aerial photos to determine the extent of river channel movement under baseline conditions. Previous aerials photos from the years 1954, 1956, 1969, 1974, 1984, 1989, and 1994 obtained from Environmental Data Resources, Inc. (EDR, 2014) were reviewed to determine if major scouring or changes in morphology of the Kaweah and St. Johns Rivers have historically occurred near the Project site (refer to the Hydrogeology and Water Quality Technical Study in Appendix G for additional detail). Based on review of these aerial photographs, no significant changes have occurred since the 1954 photograph. Terminus Dam, constructed in 1962, regulates flows and flooding, and thus river morphology and scouring. Because of the regulated flows which prevent flooding, future rapid changes in river morphology and scouring would therefore be minimized.

The potential for scouring to occur during delivery of water from the reservoir to the St. Johns and Kaweah Rivers would be minimized. The outflow and inflow channels would include a riprap and concrete aprons, constructed across the riverbed of the Kaweah River (see Figure 3.10-8). These aprons would prevent the

potential scouring effects of the water being returned to the rivers. In addition, the aprons would be installed so they do not protrude into the stream, nor affect river flow rates or patterns.

After a flood storage event in the reservoir, water stored in the upper portion of the reservoir would be released at flows ranging up to 900 cubic feet per second (cfs). The erosion protection measured installed in the reservoir will prevent erosion in the outflow structure and the 900 cfs flow rate is significantly lower than the prior natural flood flows that have occurred in the rive channels and would not result in any changes to the natural erosion patterns in these.

To release water to the Lower Kaweah River or the St. Johns River when the river water levels are higher than that of the reservoir, a floating barge pump would pump water from the reservoir into the Kaweah River, upstream of the McKay Point Structure. The floating barge pump, or series of pumps, would have an approximate maximum flow rate of 160 cfs. Erosion control features would be constructed in the floating barge pump discharge area so that the main channel of the Kaweah River is not scoured.

In addition to review of aerial photos, SLR conducted sediment transport modeling using a computer application (see Appendix G). The HEC-RAS computer application was utilized to evaluate the potential for sediment transport in the channels of the Kaweah River east of McKay Point, St. Johns River, and the Lower Kaweah River. The potential for sediment transport is dependent on the grain size distribution of channel materials, riverbed gradient, flow rate, and water flow regime. Further details regarding this evaluation are provided in the Hydrology and Water Quality Technical Study (Appendix G).

The sediment transport analysis was conducted based on the average maximum monthly flow of 1,500 cfs. This value consists of the highest average monthly flow rate measured between 2001 and 2007 documented in annual Watermaster reports (Watermaster, 2007). In other words, the flow rate used is considered the higher range of typical flow rates that occur in the Kaweah River in the Project site vicinity.

Results of the HEC-RAS sediment transport analysis are presented in Attachment C of the Hydrology and Water Quality Technical Study (DEIR Appendix G). These results include profile views of the riverbeds, which illustrate a minimal potential for scour and transport at the flow rate applied.

Based on the results of the analyses, the Project is not anticipated to alter the natural flow rates or conditions in the Lower Kaweah River and St. Johns River. During reservoir operations, flow rates in the Lower Kaweah River and St. Johns River would remain within the existing range of typical flow rates that are currently managed through outflows of Terminus Dam. Use of the Project's reservoir for flood storage may actually cause flow rates in the Lower Kaweah River and St. Johns River to decrease during periods of high precipitation, thereby reducing scour potential.

The aerial photograph analysis and HEC-RAS sediment transport evaluation both indicate that, under typical conditions, there is insignificant movement of the river channels or channel morphology along the southern boundary of the Project site. Terminus Dam is used extensively to manage flow rates in the rivers, and to avoid flow rates that would result in extensive scouring or bank movement. The Project

does not involve features or facilities that would change these conditions, and may conversely reduce flow rates during periods of extraordinary precipitation by providing flood storage. Based on these factors, Project would not result significantly impacts to existing drainage patterns due to siltation or erosion.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Less than significant.

Flood Impacts

The Project, including reservoir excavation and construction, would not alter the course of streams or rivers. The Project would, however, change onsite drainage patterns because construction of a topographic depression would reduce the amount of storm water runoff flowing out of the reservoir area. Releases from the reservoir would not cause river flows to exceed their normal flow rate range and would not cause flooding. Conversely, the reservoir would be used for flood storage, which would decrease river flow rates during period of extraordinary precipitation. Based on these factors, the Project would not increase the potential for flooding onsite or offsite. As such, the Project would have a less than significant impact.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

Create Runoff Exceeding Storm Water Drainage Systems or Create Pollution

As previously noted, since both during the excavation and reservoir phases the Project would store any rainfall that falls within the Project area, there would be no increases in flood flows outside of the Project area so the capacity of existing or planned stormwater drainage systems would not be affected. Since stormwater in the Project area would also be collected with either the excavation or reservoir, there would be no offsite sources of polluted runoff. Discharges from the reservoir for agricultural purposes

would be subject to appropriate water quality standards. Therefore, the Project is not expected to produce additional runoff or polluted runoff. The Project would result in less than significant impacts.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

Impede or Redirect Flood Flows

The Federal Emergency Management Agency (FEMA) flood map for the area including the Project site indicates that the eastern portion of the proposed reservoir is located within the 100-Year Flood Hazard Zone (Figure 3.10-5). FEMA has established base flood elevations for the St. Johns and Lower Kaweah Rivers downstream of McKay Point, but not for the Kaweah River upstream of McKay Point and the portion of the proposed reservoir within the 100-year Flood Hazard Zone. This situation is common because FEMA tends to apply its resources to conducting detailed flood mapping in populated areas (such as near the City of Visalia) rather than rural areas.

FEMA's work on the eastern portion of the Project site was not conducted in sufficient detail to establish base flood elevations, and it follows that the accuracy of the flood hazard zone presented by FEMA could be improved if flood mapping in greater detail was conducted. Therefore, SLR conducted flood modeling for this area in greater detail to establish base flood elevations, and to delineate the 100-year flood inundation area.

The HEC-RAS hydraulic software package, released by the United States Army Corps of Engineers, was used to simulate the 100-year flood flow at the Kaweah River east of McKay Point. The flow is based upon the raised spillway at the Terminus dam. The peak flow at McKay Point is 18,220 cfs, as calculated by the United States Army Corps of Engineers. Details regarding this flood modeling are included in Attachment C of the Hydrology and Water Quality Technical Study (Appendix G).

The topographic data used for flood modeling consisted of the LiDAR survey conducted for the Tulare and Visalia basin in 2004. These topographic data were part of the same dataset used by FEMA for the flood mapping conducted downstream of McKay Point as documented in FEMA (2009). A total of 12 cross-sections, spaced at a maximum of 1,000-feet apart, were created along the length of 7,600-feet east of the McKay Point junction of the Kaweah River. For purposes of model stability, cross sections were interpolated throughout the reach with sections positions at distances no larger than 75-feet apart.

SLR conducted a steady state flow analysis to calculate the based flood elevations for the peak flow of the 100-year flood for the Kaweah River east of McKay Point. The analysis was calibrated to tie into the water surface elevations calculated in the prior analyses conducted by FEMA for stretches of the St. Johns and Kaweah Rivers downstream of McKay Point.

Figure 3.10-9 presents the water surface elevations and floodway for the 100-year flood peak flow. Based on SLR's detailed flood modeling evaluation, the floodway for the 100-year flood peak flow would only encroach minimally on the proposed reservoir footprint. Although the eastern end of proposed reservoir footprint is in the areas subject to inundation as sated by FEMA, no significant quantities of water will be present in these areas. Therefore, since the Project is not expected to place structures in the 100-year flood hazard zone and is not expected to redirect flood flows this potential impact is considered less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.10.12.21 Flood Hazard, Tsunami, Seiche Zones, or Inundation

Impact Statement

Impact HWQ-4: *Would the Project be in a flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?* **(CEQA Guidelines Threshold (d))**

Impact Analysis

The Project is not near the coast, so it is not susceptible to inundation by a tsunami. In addition, the Project is surrounded by relatively flat topography, and calculations presented in Section 3.7 – Geology and Soils concluded the proposed reservoir slopes are within acceptable factors of safety. Therefore, the Project is not expected to be affected by a mudflow.

A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes. The wave can reduce water levels at one end of the water body and increase the water level on the other, similar to the "sloshing" of water back and forth.

The potential for seismic ground shaking during an earthquake to generate a seiche in the proposed reservoir was evaluated. The risk associated with a seiche overtopping of the reservoir, which could result

if the energy of the wave, is a function of its amplitude and wavelength, if the amplitude of the wave exceeds the freeboard included in the design by an amount large enough force to be detrimental to the facility.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave. Comparison of the natural period of the reservoir to that of the earthquake that may shake the site (refer to Section 4.10 of Appendix G – McKay Point Reservoir Project Hydrology and Water Quality Technical Study) indicates that a resonance condition amplifying the wave is very unlikely to occur. Specifically, the estimated value of the peak wave for the seiche at the Project site is extremely low and for practical purposes, insignificant. In addition, the ratio between the reservoir and the natural period of the seismic event that could occur on Project site is on the order of 125:1 (25/0.2), which indicates a possible resonance condition is unlikely.

Given the size of the reservoir and the anticipated earthquake dominant period, resonance would not occur at the Project site between the reservoir and ground shaking. Therefore, the risk of a damaging seiche is insignificant and any seismic generated wave would be controlled by the design freeboard. Therefore, the Project would have a less than significant impact.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.10.12.22 Water Quality/Groundwater Plans

Impact Statement

Impact HWQ-5: *Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?* **(CEQA Guidelines Threshold (e))**

Impact Analysis

As discussed in Section 3.10.12.19, the Project would not place an additional demand on surface or groundwater resources, nor would it involve a discharge that could potentially impact surface water or groundwater quality. Moreover, the site-specific pollution control plans (i.e., SWPPP, SPCC, etc.) would be prepared for the proposed Project including implementation of BMPs to provide for protection of water sources from impacts to storm water. Taken together, these Project features would not create or

otherwise result in an impediment to implanting regional water quality control plans (Basin Plans) or conflict with or obstruct the implementation of a sustainable groundwater management plans (i.e., GKSGA's Groundwater Sustainability Plan). Therefore, the Project would result in a less than significant impact and no mitigation is required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.10.13 Cumulative-Level Impacts and Mitigation Measures

Table 3.0-1 identifies the other projects within the County and the City of Woodlake considered in regards to potential cumulative impacts. As noted in Table 3.0-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with hydrology and water quality resources.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3.0-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project. Two (2) are existing aggregate mining operations, and one (1) is a community plan update). Three (3) other projects are located within 3 miles of the Project one (1) is an existing aggregate mining operation, one (1) is a residential sub-division, and one (1) is a stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to hydrology and water quality.

The context for cumulative impacts for water quality impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the impact analysis, specifically Section 3.10.12 above for each impact threshold, the Project was determined to have either no impact or a less than significant impact. Since the Project would present no significant impacts to hydrology and water quality resources, there would be no cumulative impact in conjunction with the other cumulative projects.

Additionally, as discussed in Section 3.10.5, the Project would include numerous Project design features and BMPs to protect water resources. There would be a site-specific SPCC, SWPPP, and employee training. The Project would comply with all applicable local, State and Federal requirements and regulations and obtain the necessary permits. Therefore, the Project would not make a cumulatively considerable

contribution, and the Project's cumulative impact associated with water resources would be less than significant.

3.11 LAND USE AND PLANNING

3.11.1 Introduction

This section of the DEIR presents a discussion of land use, focusing primarily on matters of land use consistency and compatibility. The information provided in this section was primarily derived from the following source:

- Tulare County Ordinance Code, Part VII, Chapter 25 – Surface Mining and Reclamation (Tulare County).
- Tulare County Zoning Ordinance (Tulare County).
- California Surface Mining and Reclamation Act of 1975 (SMARA), as amended (Public Resources Code, Section 2710 et. seq.) (Department of Conservation).
- *Map Sheet 52 (Updated 2018) Aggregate Availability in California,* by John P. Clinkenbeard & Fred W. Gius, Department of Conservation (Department of Conservation, 2018).
- Final EIR for the Tulare County General Plan 2030 Update (SCH No. 2006041162), as certified by the Tulare County Board of Supervisors on August 28, 2012 (Tulare County, 2012).
- Tulare County General Plan 2030 Update (August 2012), Part I – Goals and Policies Report (Tulare County, 2012).
- Tulare County General Plan 2030 Update (August 2012), Part II – Area Plans, Chapter 1 – Rural Valley Lands Plan (Tulare County, 2012).

3.11.2 Environmental Setting

3.11.2.1 Regional and Local Setting

Tulare County is located in a geographically diverse encompassing approximately 4,840 square miles of classified lands (lands with identified uses) and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and, a mountain region just east of the foothills. The eastern half of the County is generally comprised of public lands, including the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. Federal lands, which include wilderness, national forests, monuments and parks, along with County parks, make up 52% of the County. Agricultural uses, which include row crops, orchards, dairies, and grazing lands on the Valley floor and in the foothills total over 2,020 square miles or about 43% of the entire County. Urban uses such as incorporated cities, communities, hamlets, other unincorporated urban uses, and infrastructure rights-of-way make up the remaining land in the County.

The Project site and surrounding areas have historically been used for agriculture, including cattle grazing. Specifically, the Project site has historically been used for cattle grazing. The California Resources Agency, Division of Land Resource Protection maintains information pertaining to, and the mapping of, farmland. According to the Farmland Mapping and Monitoring Program (FMMP), the entire Project site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing of livestock." Therefore, the Project would convert existing agriculture land (i.e.,

grazing land) to a non-agricultural use. However, the Project site is not located on land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance and would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural use.

Due to the existence of high-quality aggregate in the alluvial soils in the area of the Project site there are also aggregate mining operations and processing facilities adjacent to the Project and throughout the immediate area.

3.11.3 Regulatory Setting

The Project is subject to a variety of land use regulatory requirements and designations, which are discussed fully in the sections to follow.

3.11.3.1 Federal

There are no federal land use and planning regulations that directly affect the Project.

3.11.3.2 State

Department of Conservation

The Project is also located within a designated Mineral Resource Area (MRZ-2b) as determined by the California Department of Conservation (Department of Conservation, 1997) and referenced in County General Plan (Tulare County, 2012).

Surface Mining and Reclamation Act

Even though the Project is the construction and operation of a water storage and re-regulation reservoir it is located within a designated MRZ zone. A MRZ zone is a designation by the State Mining and Geology Board (SMGB) that classifies the area as containing a mineral resource of regional or statewide significance. Because the sand and gravel (aggregate) located underneath the Project site is considered a high-quality aggregate and the County is in need of aggregate for construction materials, it seemed logical to use the material excavated for the construction of the reservoir as a marketable product. Therefore, West Coast Sand and Gravel (WCSG (i.e., an aggregate mining company) has been contracted to excavate the aggregate beneath the Project site and process it at their facility on the Seaborn site such that it could be sold as high-quality construction grade aggregate. This would be beneficial to both the County and the Project. However, by doing this the Project would be subject to the Surface Mining and Reclamation Act (SMARA).

The County permits mining and the extraction of minerals within the AE-20 zone upon "*approval of a reclamation plan and approval of financial assurances*" (Tulare County Ordinance Code, Section 7-25-1085). Tulare County Ordinance Code Section 7-25-1020 provides that "*appurtenant uses*" typical of a surface mining operation "*may be permitted through the surface mining permit approved for surface mining operations in lieu of requiring a special use permit, when such uses are found by the Planning Commission to be a reasonably necessary adjunct to the mining operations.*" (Tulare County).

California's Surface Mining and Reclamation Act (SMARA) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA's Section 2762(a) requires the SMARA Lead Agency (the County of Tulare for this Project) to:

> *"…establish mineral resource management policies to be incorporated in its general plan which will:*
>
> *(1) Recognize mineral information classified by the State Geologist and transmitted by the board.*
>
> *(2) Assist in the management of land use which affect areas of statewide and regional significance.*
>
> *(3) Emphasize the conservation and development of identified mineral deposits."*

SMARA requires the following be approved by the SMARA lead agency (the County) and requires the concurrence from Department of Mine Reclamation (DMR) before mining may begin:

- Surface Mining Permit;
- Reclamation Plan; and
- Financial Assurance Mechanism.

SMARA §2773.1(a)(3) requires that the financial assurances for each mining operation be adjusted annually to account for new lands disturbed, inflation, and reclamation of lands accomplished in accordance with SMARA and the site's approved reclamation plan. Section 3804 of the State regulations states: "The financial assurance amount shall be calculated and based on (1) an analysis of the physical activities and materials necessary to implement the approved reclamation plan; (2) the lead agency's unit costs, or costs for third party contracting, for each of these activities, if applicable, (3) the number of units of each of these activities, if applicable; (4) a contingency amount not to exceed 10% of the reclamation cost. The calculated amount should not include the cost of completing mining of the site." In order to meet the SMARA requirement, surface mining operators must submit a Financial Assurance Cost Estimate (FACE) each year.

3.11.3.3 Local

County of Tulare Zoning and General Plan Designation

The Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)", with a General Plan designation of "Valley Agriculture". The existing County General Plan and zoning designations in the vicinity of the Project site are described in Table 3.11-1 below. The Project is also located within a designated Mineral Resource Area (MRZ-2b) as determined by the California Department of Conservation (Department of Conservation, 1997) and referenced in County General Plan (Tulare County, 2012).

Table 3.11-1. Site Vicinity General Plan Land Use Designations and Zoning

Location	County General Plan Designation	Zoning Designation
Project Site	Valley Agricultural	AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)
North	Valley Agricultural	AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)
South	Valley Agricultural	AE-40 (Exclusive Agriculture Zone – 40 Acre Minimum)
East	Valley Agricultural	AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)
West	Valley Agricultural	AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)

County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the Project are listed in Table 3.11-2 along with Project consistency determinations regarding the listed policies.

Rural Valley Lands Plan Policies

The Project is located upon lands designated as Valley Agriculture in the Rural Valley Lands Plan (RVLP), which is an Area Plan within the 2030 Update of the Tulare County General Plan. Part II – Chapter 1 (Rural Valley Lands Plan) notes the following:

> *"The RVLP was initiated in order to establish minimum parcel sizes for areas zoned for agriculture and to develop a policy that is fair, logical, legally supportable, and which consistently utilizes resource information to determine the suitability of rural lands for non-agricultural uses. The policies in this chapter will act as a guide to the Planning Commission and Board of Supervisors in determining appropriate minimum parcel sizes and areas where non-agricultural use exceptions in the rural areas of the County may be allowed." (Tulare County, 2012)*

RVLP General Plan policies that relate to the Project are listed in Table 3.11-2 located in Section 3.8.6.2 along with Project consistency determinations regarding the listed policies.

3.11.4 Significance Thresholds

According to Appendix G of the CEQA Guidelines, the Project would have a significant impact if it would:

a. *Physically divide an established community.*

b. *Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.*

3.11.5 Methodology of Analysis

The following points were considered in the Land Use and Planning evaluation:

- Historically, the site has experienced only marginal agricultural use in the form of seasonal livestock grazing. The entire Project site is designated as Grazing Land per the FMMP, which,

among other definitions, includes "*land on which the existing vegetation is suited to the grazing of livestock.*" As discussed above, the Project site is not located on Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance. As such, the Project would have no impact on any category of important farmland. The Project site is not currently being utilized as a farming operation to cultivate or grow crops. In addition, the underlying land is not under a Williamson Act contract.

- The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- In identifying the area underlying the Project site as MRZ-2b, the State of California and the County General Plan have determined this area contains mineral deposits where geologic data show that significant measured or indicated resources are present, or where geologic information indicates that significant inferred resources are present. Land included in the MRZ-2b category is of prime importance because it contains known economic mineral deposits. A typical MRZ-2b area would include an operating mine, or an area where extensive sampling indicates the presence of a significant mineral deposit. This site is also designated by the State as having aggregate deposits of regional significance.

3.11.6 Project-Level Impacts and Mitigation Measures

3.11.6.1 Divide Established Community

Impact Statement

Impact LU-1: *Would the Project physically divide an established community?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

As shown in Figure 2-2 – Project Site and Land Use Map, the Project would not physically divide an established community, nor would it require a land division. Therefore, the Project would have no impact in regards to CEQA Threshold Criterion (a) and therefore does not require further analysis.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.11.6.2 Conflict with Applicable Plans, Policies or Regulations

Impact Statement

Impact LU-2: *Would the Project Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

Table 3.11-2 provides a consistency analysis of the applicable Tulare County General Plan policies.

Table 3.11-2. General Plan Policy Consistency Analysis

Policy	Consistency Analysis
PART 1 – GOALS AND POLICIES REPORTS	
Agriculture	
AG-1: To promote for the long-term preservation of productive and potentially productive agricultural lands and to accommodate agricultural support services and agriculturally related activities that supports the viability of agriculture and further the County's economic development goals.	
AG-1.1 – Primary Land Use: The County shall maintain agriculture as the primary land use in the valley region of the County, not only in recognition of the economic importance of agriculture, but also in terms of agriculture's real contribution to the conservation of open space and natural resources.	**The Project is consistent with this policy:** The Project is located in an area designated Valley Agriculture, Mineral Resources Zone (MRZ-2b), as well as Grazing Land per the FMMP. The Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities. The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, groundwater recharge supplies.
AG-1.2 – Coordination: The County shall coordinate its agricultural policies and programs with state and federal regulations to preserve agricultural lands.	**The Project is consistent with this policy:** Through CEQA, SMARA and County approval process, the County shall review the Project to ensure that it is consistent with County agricultural policies and programs as well as state and federal regulations to preserve agricultural lands.

Policy	Consistency Analysis
AG-1.7 – Preservation of Agricultural Lands: The County shall promote the preservation of its agricultural economic base and open space resources through the implementation of resource management programs such as the Williamson Act, Rural Valley Lands Plan, Foothill Growth Management Plan or similar types of strategies and the identification of growth boundaries for all urban areas located in the County.	**The Project is consistent with this policy:** The Project is not subject to the Williamson Act, Rural Valley Lands Plan, Foothill Growth Management Plan or other similar plans related to growth boundaries of urban areas, with the exception Rural Valley Lands Plan (RVLP) which is discussed below. The Project does not involve growth of urban areas. The Project would also not convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities.
AG-1.10 – Extension of Infrastructure into Agricultural Areas: The County shall oppose extension of urban services such as sewer line, water lines or other urban infrastructure, into areas designated for agriculture use unless necessary to resolve a public health situation. Where necessary to address a public health issue, services should be located in public rights-of-way in order to prevent interference with agricultural operations and to provide ease of access for operation and maintenance. Service capacity and length of lines should be designed to prevent the conversion of agricultural lands into urban/suburban uses.	**The Project is consistent with this policy:** The Project is located in an area designated Valley Agriculture and Mineral Resources Zone (MRZ-2b). The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies . The Project would not require extensions of any urban services, nor would it interfere with nearby existing agricultural operations. The Project would also not convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities.

Policy	Consistency Analysis
AG-1.13 – Agricultural Related Uses: The County shall allow agriculturally related uses, including value added processing facilities by discretionary approvals in areas designated Valley or Foothill Agriculture, subject to the following criteria: 1. The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics; 2. The use shall not be sited on productive agricultural lands if less productive land is available in the vicinity; 3. The operational or physical characteristics of the use shall not have a significant adverse impact on water resources or the use or management of surrounding agricultural properties within at least one-quarter (1/4) mile radius; 4. A probable workforce should be located nearby or be readily available; and 5. For proposed value-added agricultural processing facilities, the evaluation under criterion "1" above shall consider the service requirements of the use and the capability and capacity of cities and unincorporated communities to provide the required services.	**The Project is consistent with this policy:** The Project is located in an area designated Valley Agriculture and Mineral Resources Zone (MRZ-2b). The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies . The reservoir and related facilities would help manage surface water supplies to increase the long-term availability of irrigation supplies, therefore providing a benefit to surrounding agricultural operations. The Project would also not convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities.
AG-1.17 – Agricultural Water Resources: The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture.	**The Project is consistent with this policy:** The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies. As such, the Project would enhance surface water and groundwater resources critical to agriculture.
Land Use	
LU-1: To encourage the overall economic and social growth of the County while maintaining the quality of life standards and highly efficient land use.	

Policy	Consistency Analysis
LU-1.1 – Smart Growth and Healthy Communities: The County shall promote the principles of smart growth and healthy communities in Urban Development Boundaries (UDBs) and Hamlet Development Boundaries (HDBs), including: 1. Creating walkable neighborhoods, 2. Providing a mix of residential densities, 3. Creating a strong sense of place, 4. Mixing land uses, 5. Directing growth toward existing communities, 6. Building compactly, 7. Discouraging sprawl, 8. Encouraging infill, 9. Preserving open space, 10. Creating a range of housing opportunities and choices, 11. Utilizing planned community zoning to provide for the orderly pre-planning and long-term development of large tracks of land which may contain a variety of land uses, but are under unified ownership or development control, and 12. Encouraging connectivity between new and existing development.	**The Project is consistent with this policy:** Although the Project is not located in UDBs or HDBs, it does promote the principles of smart growth and healthy communities through creation of a reservoir that would benefit the local community, as seen by the Project objectives (Refer to Section 1.2 – Project Objectives).
LU-1.2 – Innovative Development: The County shall promote flexibility and innovation through the use of planned unit development, development agreements, specific plans, Mixed Use project and other innovative development and planning techniques.	**The Project is consistent with this policy:** Although the Project is not an urban development project, it does promote flexibility and innovation through re-regulation and storage of flood waters, as seen by the Project objectives (Refer to Section 1.2 – Project Objectives).
LU-1.6 – Permitting Procedures and Regulations: The County shall continue to ensure that its permitting procedures and regulations are consistent and efficient.	**The Project is consistent with this policy:** Through the CEQA, SMARA and County review and approval process, the County shall ensure that permitting procedures and regulations are consistent and efficient.
LU-1.7 – Development on Slopes: The County shall require a preliminary soils report for development projects in areas with shallow or unstable soils or slopes in excess of 15 percent. If the preliminary soil report indicates soil conditions could be unstable, a detailed geologic/hydrologic report by a registered geologist, civil engineer, or engineering geologist shall be required demonstrating the suitability of any proposed or additional development.	**The Project is consistent with this policy:** A geologic/hydrologic analysis was prepared by SLR Consulting Limited/Hutchison Engineering, Inc. The hydrogeologic technical reports are provided in Appendix G. As described in the technical reports report, the soils underlying the Project site would be suitable and stable for the proposed development.

Policy	Consistency Analysis
LU-1.10 – Roadway Access: The County shall require access to public roadways for all new development.	**The Project is consistent with this policy:** As discussed in Section 1.0, the Project would not result in additional vehicles/trucks on offsite public roadways. Additionally, no new access roads would be constructed as a result of the Project.
LU-2: To provide for the long-term conservation of productive and natural resource lands including agricultural, foothill, mountain and riparian areas and to accommodate services and related activities that support the continued viability and conservation of resource lands.	
LU-2.3 – Open Space Character: The County shall require that all new development requiring a County discretionary approval, including parcel and subdivision maps, be planned and designed to maintain the scenic open space character of open space resources including, but not limited to, agricultural areas, rangeland, riparian areas, etc., within the view corridors of highways. New development shall utilize natural landforms and vegetation in the least visually disruptive way possible and use design, construction and maintenance techniques that minimize the visibility of structures on hilltops, hillsides, ridgelines, steep slopes, and canyons.	**The Project is consistent with this policy:** As discussed in Section 1.0, the Project is set back from the river's banks and there would not be large above-grade structures visible from the adjacent Kaweah and St. Johns Rivers. Once the construction of the reservoir is completed it would have a scenic open space character. additionally, because dry mining techniques would be used during the Project excavation phase, there would be no need for draglines that could have an adverse impact on the views from the rivers or nearby open space areas.
LU-2.6 – Industrial Development: Other than provided in Policy LU-2.5: Agricultural Support Facilities, the County shall and the cities should, through their industrial development policies, approve only those agriculturally-oriented or related industries and uses that can demonstrate, whether by location and/or controlled methods of operation, that they will not adversely affect agricultural production or the County's natural resources. These uses should be located inside UDBs, HDBs, PCAs and regional growth corridors unless necessary for the support of agricultural operations or as provided in Policy LU-2.5: Agricultural Support Facilities.	**The Project is consistent with this policy:** The Project is located in an area designated Valley Agriculture and Mineral Resources Zone (MRZ-2b). The Project would not convert any existing Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities and the Project would allow for the extraction of important mineral resources (aggregate). The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies. As such, the Project would enhance agricultural operations.
LU-5: To designate adequate land for and promote development of, industrial uses to meet the present and future needs of the County residents for jobs and to maintain economic vitality.	
LU-5.4 – Compatibility with Surrounding Land Use: The County shall encourage the infill of existing industrial areas and ensure that proposed industrial uses will not result in significant harmful impacts to adjacent land uses.	**The Project is consistent with this policy:** The Project has been designed so as not to impact adjacent land uses, which include existing aggregate mining and processing operations.

Policy	Consistency Analysis
LU-5.5 – Access: The County shall locate industrial development where there is access from collector or arterial roads, and where industrial/heavy commercial traffic is not routed through residential or other areas with uses not compatible with such traffic.	**The Project is consistent with this policy:** As discussed in Section 1.0, the Project would not result in additional vehicles/trucks on offsite public roadways. Additionally, there are no proposed changes to the existing Project access routes connecting to arterial roads.
LU-5.7 – **Industrial Uses Allowed on Resource Land**: The County shall allow asphalt batch plants and similar processing facilities that are directly associated with the development of a resource to be located at the site of the resource under the following criteria: 1. Any such site shall be developed under the Special Use Permit process, and 2. The Special Use Permit shall not permit any commercial or industrial uses that are not related to the processing of the resource.	**The Project is consistent with this policy:** The portable aggregate processing plant with would be located either on the Seaborn site or the Project site would be consistent with this policy. The portable processing plant would be used to for processing of aggregate removed during the excavation of the reservoir. The County requires a Surface Mining Permit and the preparation and County approval of a Reclamation Plan and Financial Insurance in accordance with the requirements of SMARA and the Tulare County Zoning Ordinance, Section 25.
Economic Development	
ED-5: To take full advantage of the natural, cultural and social opportunities available in the County for the enhancement of tourism.	
ED-5.5 – Rivers: The County shall encourage the development of recreational activities and promote tourism along the Kaweah, Tule and Kings River.	**The Project is consistent with this policy:** The Project is located adjacent to the Lower Kaweah River and the St. Johns River. The majority of the existing and potential recreational use of the Kaweah River is above Lake Kaweah, not in the lower portions of the Kaweah River. The Project would not result in impacts to existing or future recreational activities along the Lower Kaweah River and the St. Johns River. It would also have less than significant impacts on views from the rivers and would not diminish the enjoyment from recreational use of the rivers (Refer to Section 1.0 – Introduction).
Scenic Landscapes	
SL-1: To protect and feature the beauty of Tulare County's views of working and natural landscapes.	

Policy	Consistency Analysis
SL-1.1 – Natural Landscapes: During review of discretionary approvals, including parcel and subdivision maps, the County shall as appropriate, require new development to not significantly impact or block views of Tulare County's natural landscapes. 1. Be sited to minimize obstruction of views from public lands and rights-of-ways, 2. Be designed to reduce visual prominence by keeping development below ridge lines, using regionally familiar architectural forms, materials, and colors that blend structures into the landscape, 3. Screen parking areas from view, 4. Include landscaping that screens the development, 5. Limit the impact of new roadways and grading on natural settings, and 6. Include signage that is compatible and in character with the location and building design.	**The Project is consistent with this policy:** The Project is consistent with the surrounding land uses and would not include large above grade structures that would impact or block views of the landscape (Refer to Section 1.7).
SL-1.2 – Working Landscapes: The County shall require that new non-agricultural structures and infrastructures located in or adjacent to croplands, orchards, vineyards, and open rangelands be sited so as to not obstruct important viewsheds and to be designed to reflect unique relationships with the landscape by: 1. Referencing traditional agricultural building forms and materials, 2. Screening and breaking up parking and paving with landscaping, and 3. Minimizing light pollution and bright signage.	**The Project is consistent with this policy:** The Project is consistent with the surrounding land uses and would not include large above-grade structures that would impact or block views of the landscape. Once the construction of the reservoir is completed it would have a scenic open space character (Refer to Section 1.7).
SL-1.3 – Watercourses: The County shall protect visual access to and the character of, Tulare County's scenic rivers, lakes and irrigation canals by: 1. Locating and designing new development to minimize visual impacts and obstruction of views of scenic watercourses from public lands and right-of-ways, and 2. Maintaining the rural and natural character of landscape viewed from trails and watercourses used for public recreation.	**The Project is consistent with this policy:** The Project is located adjacent to the Lower Kaweah River and the St. Johns River. The Project is consistent with the surrounding land uses and would not include large above-grade structures that would impact or block views of the landscape from the watercourses. The Project would have less than significant impacts on views from the rivers and would not diminish the enjoyment from recreational use of the rivers. Once the construction of the reservoir is completed it would have a scenic open space character (Refer to Sections 1.7 and 3.0).
Environmental Resources Management	

Policy	Consistency Analysis
ERM-1: To preserve and protect sensitive significant habitats, enhance biodiversity, and promote healthy ecosystems throughout the County.	
ERM-1.1 – Protection of Rare and Endangered Species: The County shall ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by State and/or federal government, through compatible land use development.	**The Project is consistent with this policy:** The DEIR evaluated potential impacts to environmentally sensitive wildlife and plant life. Biological resource studies were conducted and Mitigation Measures have been identified to protect these species if they occur on the Project site (Refer to Sections 3.3.5 and 3.3.6).
ERM-1.2 – Development in Environmentally Sensitive Areas: The County shall limit or modify proposed development within areas that contain sensitive habitat for special status species and direct development into less significant habitat areas. Development in natural habitats shall be controlled so as to minimize erosion and maximize beneficial vegetative growth.	**The Project is consistent with this policy:** The DEIR evaluated potential impacts to areas that contain sensitive habitat for special status species. Biological resource studies were conducted and Mitigation Measures have been identified to protect these species if they occur on the Project site (Refer to Sections 3.3.5 and 3.3.6).
ERM-1.4 – Protect Riparian Areas: The County shall protect riparian areas through habitat preservation, designation as open space or recreational land uses, bank stabilization, and development controls.	**The Project is consistent with this policy:** The Project is located adjacent to the Lower Kaweah and St. Johns Rivers. These rivers are considered Waters of the United States and the State; therefore, the Project would be subject to the regulatory and permitting requirements (development controls) under the federal Clean Water Act (CWA) and California Porter Cologne Act. The DEIR evaluated potential impacts to wetland and riparian areas along the rivers.
ERM-1.5 – Riparian Management Plans and Mining Reclamation Plans: The County shall require that mining reclamation plans and other management plans include measures to protect, maintain and restore riparian resources and habitats.	**The Project is consistent with this policy:** The Project is located adjacent to the Lower Kaweah and St. Johns Rivers. The DEIR evaluated potential impacts to riparian area along the rivers. The reservoir excavation phase of the Project would not disturb the oak wildland in the southern portion of the Project site and would be conducted per SMARA requirements. In addition, a Reclamation Plan would be prepared and submitted to the County. The reservoir is the identified reclaimed end use for the Project site.

Policy	Consistency Analysis
ERM-1.6 – Management of Wetlands: The County shall support the preservation and management of wetland and riparian plant communities for passive recreation, groundwater recharge, and wildlife habitats.	**The Project is consistent with this policy:** The Project is a surface water storage and re-regulation reservoir which would support groundwater recharge and the general character of the habitats in the area of the Project. The Project is located adjacent to the Lower Kaweah and St. Johns Rivers. These rivers are considered Waters of the United States and the State; therefore, the Project would be subject to the regulatory and permitting requirements under the federal CWA and California Porter Cologne Act. These regulations protect and preserve the wetland and riparian communities. The DEIR evaluated potential impacts to wetland and riparian areas and has identified mitigation measures as necessary to support the preservation and management of these communities. In additional, as part of the Project design, the oak riparian woodland in the southern portion of the Project site would not be included in the excavation of the sire.
ERM-1.7 – Planting of Native Vegetation: The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.	**The Project is consistent with this policy:** The reservoir excavation phase of the Project would be conducted per SMARA requirements and accordingly a Reclamation Plan would be prepared and submitted to the County. The Reclamation Plan would include a Revegetation Plan using native vegetation with goals to maintain the number and variety of native species. The reservoir is the identified reclaimed end use for the Project site. In addition, the oak riparian woodland in the southern portion of the site would not be included in the excavation of the site.
ERM-1.8 – Open Space Buffers: The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state.	**The Project is consistent with this policy:** The Project is located adjacent to the Lower Kaweah and St. Johns Rivers. Figure 2-4 – Final Reservoir Site Plan, illustrates how the Project boundary is pulled back from the river, in most areas at least 200-feet, except where the Inflow and Outflow Channels would be installed. The vast majority of the oak-riparian woodland to the southeast would not be affected by the Project, save for some use of that area to plant replacement trees.

Policy	Consistency Analysis
ERM-1.12 – Management of Oak Woodland Communities: The County shall support the conservation and management of oak woodland communities and their habitats.	**The Project is consistent with this policy:** There is an oak-riparian woodland in the southeastern portion of the Project site, the vast majority of which would not be affected by the Project, save for some use of that area to plant replacement trees.
ERM-2: To conserve protect and encourage the development of areas containing mineral deposits while considering values relating to water resources, air quality, agriculture, traffic, biotic, recreation, aesthetic enjoyment and other public interest values.	
ERM-2.1 – Conserve Mineral Deposits: The County will encourage the conservation of identified and/or potential mineral deposits, recognizing the need for identifying, permitting, and maintaining a 50-year supply of locally available PCC grade aggregate.	**The Project is consistent with this policy:** The Project will promote the development of identified mineral (aggregate) deposits. As discussed in Section 3.11.3.1, if approved, the Project would add an estimated 9.66 million net tons to the 50-year supply of permitted aggregate reserves within the Tulare County.
ERM-2.5 – Resources Development: The County will promote the responsible development of identified and/or potential mineral deposits	**The Project is consistent with this policy:** The Project would not prevent the availability of a mineral deposit. The Project will promote the responsible development of identified mineral (aggregate) deposits providing the rock removed during the excavation of the reservoir to be processed and used as commercial aggregate.
ERM-2-7 – Minimize Adverse Impacts: The County will minimize the adverse effects on environmental features such as water quality and quantity, air quality, flood plains, geophysical characteristics, biotic, archaeological and aesthetic factors.	**The Project is consistent with this policy:** Potential environmental impacts associated with the Project have been evaluated under CEQA in this DEIR, including but not limited to Hydrology/Water Quality, Air Quality, Biological Resources, Cultural Resources and Aesthetic Resources (Refer to Section 1.0 – Introduction).
ERM-2.8 – Minimize Hazards and Nuisances: The County will minimize the hazards and nuisances to persons and properties in the area during extraction, processing and reclamation operations.	**The Project is consistent with this policy:** The Project would be conducted in compliance with SMARA requirements.
ERM-2.9 – Compatibility: The County will encourage the development of mineral deposits in a manner compatible with surrounding land uses.	**The Project is consistent with this policy:** Project excavation would be conducted in a manner compatible with surrounding land uses, which include existing aggregate operations.
ERM-2.10 – Incompatible Development: Proposed incompatible land uses in the County shall not be on lands containing or adjacent to identified mineral deposits, or along key access roads, unless adequate mitigation measures are adopted or a statement of overriding considerations stating public benefits and overriding reasons for permitting the proposed use are adopted.	**The Project is consistent with this policy:** The Project is compatible with lands containing mineral deposits. Project excavation would allow for the extraction of aggregate to then be used to support the County's need for construction materials.

Policy	Consistency Analysis
ERM-2.13 – SMARA Requirements: All surface mines in the County, unless otherwise exempt, shall be subject to reclamation plans that meet SMARA requirements. Reclamation procedures shall restore the site for future beneficial use of the land consistent with the Tulare County General Plan, subsequent to the completion of surface mining activities. Mine reclamation costs shall be borne by the mine operator, and guaranteed by financial assurances set aside for restoration procedures.	**The Project is consistent with this policy:** The Project would be subject to and comply with all applicable SMARA requirements.
ERM-3.1 – Environmental Contamination: All mining operations in the County shall be required to take precautions to avoid contamination from wastes or incidents related to the storage and disposal of hazardous materials, or general operating activity at the site.	**The Project is consistent with this policy:** The use, storage, transportation and disposal of hazardous materials associated with the Project was evaluated during the CEQA process and discussed in Section 3.7 – Hydrology/Water Quality. Hazardous materials would be managed in accordance with applicable local, state and federal requirements, including the preparation of a Spill Prevention, Control and Countermeasure Plan (SPCC), Storm Water Pollution Prevention Plan (SWPPP), a Hazardous Materials Business Plan (HMBP) and a Contingency Plan.
ERM-6: To manage and protect sites of cultural and archaeological importance for the benefit of present and future generations.	
ERM-6.2 – Protection of Resources with Potential State or Federal Designations: The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of Statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.	**The Project is consistent with this policy:** Site surveys and record searches did indicate that cultural and archaeological resources could be located at the Project site. Therefore, Mitigation Measure CUL-1 and CUL-2 are designed to protect these resources (Refer to Sections 3.3.5 and 3.3.6). The Project would also be subject to the requirements of Assembly Bill (AB) 52 to protect Tribal Cultural Resources (see Section 3.11).
ERM-6.3 – Alteration of Sites with Identified Cultural Resources: When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and Mitigation Measures proposed for any impacts the development may have on the resource.	**The Project is consistent with this policy:** Site surveys and record searches indicate cultural and archaeological resources could be located at the Project site. Therefore, Mitigation Measure CUL-1 and CUL-2 are designed to protect these resources (Refer to Sections 3.3.5 and 3.3.6).

Policy	Consistency Analysis
ERM-6.4 – Mitigation: If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.	**The Project is consistent with this policy:** Site surveys and record searches indicate cultural and archaeological resources could be located at the Project site. Mitigation Measure CUL-1 and CUL-2 are designed to protect these resources (Refer to Sections 3.3.5 and 3.3.6).
ERM- 6.8 – Solicit Input from Local Native Americans: The County shall continue to solicit input from the Native American communities in cases where development may result in disturbance to sites containing evidence of Native American activity and/or to site of cultural importance.	**The Project is consistent with this policy:** The Native American Heritage Commission (NAHC) was contacted and letters sent to contacts identified by the NAHC. Site surveys and record searches also indicated cultural and archaeological resources could be located at the Project site. Therefore, Mitigation Measures CUL-1, and CUL-2 are designed to protect these resources (Refer to Sections 3.3.5 and 3.3.6). The Project would also be subject to the requirements of AB 52 to protect Tribal Cultural Resources (see Section 3.10- Tribal Cultural Resources).
ERM- 6.10 – Grading Cultural Resources Sites: The County shall ensure all grading activities conform to the County's Grading Ordinance and the CCR Title 20 Section 2501 et. Seq.	**The Project is consistent with this policy:** The Project comply with all grading requirements required by the County's Grading Ordinance and the CCR Title 20 Section 2501 et. Seq. In addition, the Project would comply with the grading and slope stability requirements of SMARA. In addition, cultural resources would be protected as described in Section 3.3 – Cultural Resources.
ERM-7: To preserve and protect soil resources in the County for agricultural and timber productivity and protect public health and safety.	
ERM-7.2 – Soil Productivity: The County shall encourage landowners to participate in programs that reduce soil erosion and increase soil productivity. To this end, the County shall promote coordination between the Natural Resources Conservation Service, Resource Conservation Districts, UC Cooperative Extension, and other similar agencies and organizations.	**The Project is consistent with this policy:** As required by SMARA, the Project incorporates many design considerations and practices to reduce the potential for, and impacts of erosion. Vegetation and topsoil would be removed during the initial site preparation and excavation of the reservoir. Topsoil removed would be stockpiled for use in reclamation and revegetation of the Project site in accordance with the SMARA Reclamation Plan (Refer to Section 3.2.5).

Policy	Consistency Analysis
ERM-7.3 – Protection of Soils on Slopes: Unless otherwise provided for in this General Plan, building and road construction on slopes of more than 30 percent shall be prohibited, and development proposals on slopes of 15 percent or more shall be accompanied by plans for control or prevention of erosion, alteration of surface water runoff, soil slippage, and wildfire occurrence.	**The Project is consistent with this policy:** Erosion control associated with the slopes created during excavation activities would be implemented as required by SMARA and discussed in the Reclamation Plan. The Project incorporates many design considerations and practices to reduce the potential for, and impacts of erosion. The Project would also comply with SMARA's requirements for slope stability (Refer to Section 3.2.5).
Air Quality	
AQ-1: To improve air quality through a regional approach and interagency cooperation.	
AQ-1.1 – Cooperation with Other Agencies: The County shall cooperate with other local, regional, Federal, and State agencies in developing and implementing air quality plans to achieve State and federal Ambient Air Quality Standards. The County shall partner with the SJVAPCD, Tulare County Association of Governments (TCAG), and the California Air Resource Board to achieve better air quality conditions locally and regionally.	**The Project is consistent with this policy:** The San Joaquin Valley Air Pollution Control District (SJVAPCD) is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and California Air Resources Board (CARB) policies and guidelines. An Air Quality and Climate Change Impact Assessment (AQCCIA) was prepared for the Project in order to demonstrate compliance with CEQA threshold and state, federal and local air quality regulations (Refer to Section 3.1 – Air Quality).
AQ-1.2 – Cooperation with Local Jurisdictions: The County shall participate with cities, surrounding counties, and regional agencies to address cross-jurisdictional transportation and air quality issues.	**The Project is consistent with this policy:** The SJVAPCD is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and CARB policies and guidelines. An Air Quality and Climate Change Impact Assessment (AQCCIA) was prepared for the Project in order to demonstrate compliance with CEQA threshold and state, federal and local air quality regulations (Refer to Section 3.1 – Air Quality).
AQ-1.3 – Cumulative Air Quality Impacts: The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to propose alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.	**The Project is consistent with this policy:** Cumulative impacts associated with air quality have been evaluated in the DEIR and it was determined that the Project would not have cumulatively considerable impacts. An Air Quality and Climate Change Impact Assessment (AQCCIA) was prepared for the Project in order to demonstrate compliance with CEQA threshold and state, federal and local air quality regulations (Refer to Section 3.1.7).

Policy	Consistency Analysis
AQ-1.4 – Air Quality Land Use Compatibility: The County shall evaluate the compatibility of industrial or other developments, which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.	**The Project is consistent with this policy:** The SJVAPCD is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and CARB policies and guidelines. A Health Risk Assessment (HRA) was prepared for this DEIR and it was determined that there would not be significant impacts to sensitive receptors other than at one receptor, a rental property owned by TID. Mitigation Measure AQ-4 would be implemented to mitigate this impact (Refer to Section 3.1.6).
AQ-1.5 – California Environmental Quality Act (CEQA) Compliance: The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonable mitigated when feasible.	**The Project is consistent with this policy:** Potential air quality impacts were identified and evaluated during this CEQA process. An Air Quality and Climate Change Impact Assessment (AQCCIA) was prepared for the Project in order to demonstrate compliance with CEQA threshold and state, federal and local air quality regulations. Mitigation Measure AQ-4 was identified to mitigate potential health risk impacts (Refer to Section 3.1.6).
AQ-1.7 – Support Statewide Climate Change Solutions: The County shall monitor and support the efforts of Cal/EPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code §38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.	**The Project is consistent with this policy:** Greenhouse Gas (GHG) emissions were evaluated for compliance and/or consistency with AB 32 and other GHG policies and guidelines. No mitigation measures would be required (Refer to Section 3.5.6).
AQ-4: To implement the best available controls and monitoring necessary to regulate air emissions.	
AQ-4.1 – Air Pollution Control Technology: The County shall utilize the BACM and RACM as adopted by the County to support SJVAPCD air quality attainment plans to achieve and maintain healthful air quality and high visibility standards. These measures shall be applied to new development approvals and permit modifications as appropriate.	**The Project is consistent with this policy:** The SJVAPCD is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and CARB policies and guidelines (Refer to Section 3.1).

Policy	Consistency Analysis
AQ-4.2 – Dust Suppression Measures: The County shall require developers to implement dust suppression measures during excavation, grading, and site preparation activities consistent with SJVAPCD Regulation VIII – Fugitive Dust Prohibitions. Techniques may include, but are not limited to, the following: 1. Site watering or application of dust suppressants, 2. Phasing or extension of grading operations, 3. Covering of stockpiles, 4. Suspension of grading activities during high wind periods (typically winds greater than 25 miles per hour), and 5. Re-vegetation of graded areas.	**The Project is consistent with this policy:** The SJVAPCD is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and CARB policies and guidelines. Project Design Features as well as Mitigation Measures have been incorporated into the Project to ensure that potential dust impacts are less than significant (Refer to Section 3.1).
AQ-4.3 – Paving or Treatment of Roadways for Reduced Air Emissions: The County shall require that all new roads be paved or treated to reduce dust generation where feasible as required by SJVAPCD Regulation VIII, Rule 8061- Paved and Unpaved Roads. For new projects with unpaved roads, funding for roadway maintenance shall be adequately addressed and secured.	**The Project is consistent with this policy:** The SJVAPCD is a responsible agency in this CEQA process. The Project would be in compliance with applicable SJVAPCD rules and regulations and CARB policies and guidelines. Project Design Features as well as Mitigation Measures have been incorporated into the Project to ensure that potential dust impacts are less than significant (Refer to Section 3.1).
AQ-4.5 – Public Awareness: The County shall promote public awareness of the seriousness and extent of the existing air quality problems.	**The Project is consistent with this policy:** Public awareness is a key component of the CEQA process. Public meetings were held during the CEQA scoping process and the DEIR and FEIR will be provided to the public for review and comment.
AQ-4.6 – Asbestos Airborne Toxic Control and Dust Protection: Asbestos is of concern to Tulare County because it occurs naturally in surface deposits of several types of ultramafic materials (materials that contain magnesium and iron and a very small amount of silica). Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. See Implementation Measure 15.	**The Project is consistent with this policy:** The Project is not located in an area where Naturally Occurring Asbestos (NOA) is expected to be present. Alluvial deposits are considered exempt from NOA regulations. In addition, the Project would not involve the use of asbestos containing materials.
Health & Safety	
HS-2: To reduce the risk to life and property and governmental costs from seismic and geologic hazards.	

Policy	Consistency Analysis
HS-2.1 – Continued Evaluation of Earthquake Risks: The County shall continue to evaluate areas to determine levels of earthquake risk.	**The Project is consistent with this policy:** Potential risks associated with earthquakes were evaluated in this DEIR. In addition, slope stability analysis was conducted as required by SMARA. The closest faults to the Project site are the Independence Fault, the Owens Valley Fault Zone, and the San Andreas Fault Zone, at least 35 miles from the Project site. Because the Project site is not located within or near a designated Alquist-Priolo Earthquake Zone (APEZ), there is little potential for the occurrence of surface fault rupture. As a result, the Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving major geological hazards (Refer to Section 3.4 – Geology/Soils).
HS-2.4 – Structure Siting: The County shall permit development on soils sensitive to seismic activity permitted only after adequate site analysis, including appropriate siting, design of structure, and foundation integrity.	**The Project is consistent with this policy:** Potential risks associated with earthquakes were evaluated in this DEIR. In addition, slope stability analysis was conducted as required by SMARA. The closest faults to the Project site are the Independence Fault, the Owens Valley Fault Zone, and the San Andreas Fault Zone, at least 35 miles from the Project site. Because the Project site is not located within or near a designated Alquist-Priolo Earthquake Zone (APEZ), there is little potential for the occurrence of surface fault rupture. As a result, the Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving major geological hazards (Refer to Section 3.4 – Geology/Soils).
HS-2.7 – Subsidence: The County shall confirm that development is not located in any known areas of active subsidence. If urban development may be located in such an area, a special safety study will be prepared and needed safety measures implemented. The County shall also request that developments provide evidence that its long-term use of ground water resources, where applicable, will not result in notable subsidence attributed to the new extraction of groundwater resources for use by the development.	**The Project is consistent with this policy:** Potential risks associated with subsidence were evaluated in this DEIR (Refer to Section 3.4 – Geology/Soils).

Policy	Consistency Analysis
HS-2.8 – Alquist-Priolo Act Compliance: The County shall not permit any structure for human occupancy to be placed within designated Earthquake Fault Zones (pursuant to and as determined by the Alquist-Priolo Earthquake Fault Zoning Act; Public Resource code, Chapter 7.5) unless the specific provision of the Act and Title 14 of the California Code of Regulations have been satisfied.	**The Project is consistent with this policy:** The Project site is not located within or near a designated APEZ (Refer to Section 3.4 – Geology/Soils).
HS-4: To protect residents, visitors, and property from hazardous materials through their safe use, storage, transport, and disposal.	
HS-4.1 – Hazardous Materials: The County shall strive to ensure hazardous materials are used, stored, transported and disposed of in a safe manner, in compliance with local, State and Federal safety standards, including the Hazardous Waste Management Plan, Emergency Operations Plan and Area Plan.	**The Project is consistent with this policy:** The use, storage, transportation and disposal of hazardous materials associated with the Project was evaluated during the CEQA process. Minimal amounts of hazardous materials would be used at the site with the exception of an above surface tank (AST) for the storage of diesel fuel. Hazardous materials would be managed in accordance with applicable local, state and federal requirements, including the preparation of a SPCC Plan, SWPPP and a HMBP (which includes a Contingency Plan).
HS-4.4 – Contamination Prevention: The County shall review new development proposals to protect soils, air quality, surface water, and groundwater from hazardous materials contamination.	**The Project is consistent with this policy:** The County is the lead agency for SMARA compliance and a responsible agency under CEQA. These roles require that the County shall review the Project for potential environmental impacts and compliance with state, federal and local regulations. The use, storage, transportation and disposal of hazardous materials associated with the Project was evaluated during the CEQA process. Hazardous materials would be managed in accordance with applicable local, state and federal requirements, including the preparation of a SPCC, SWPPP, and a HMBP. Potential impacts associated with air and water quality are further evaluated in the DEIR (Refer to Sections 3.6 and 3.7).
HS-4.8 – Hazardous Materials Studies: The County shall ensure that the proponents of new development projects address hazardous materials concerns through the preparation of Phase I or Phase II hazardous materials studies for each identified site as part of the design phase for each project. Recommendations required to satisfy federal or State cleanup standards outlined in the studies will be implemented as part of the construction phase for each project.	**The Project is consistent with this policy:** A Phase I assessment of the Project site was completed by BSK Associates. The Phase I revealed no evidence of recognized environmental conditions in connection with the property, and no further investigation was recommended.

Policy	Consistency Analysis
HS-5: To minimize the possibility for loss of life, injury, or damage to property as a result of flood hazards.	
HS-5.1 – Development Compliance with Federal, State and Local Requirements: The County shall ensure that all development within the designated floodway or floodplain zones conforms to FEMA regulations and the Tulare County Flood Damage Prevention Ordinance. New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, infrastructure, and ensure safe access and evacuation during flood conditions.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of flood control. The Project would comply with FEMA and County regulations.
HS-5.2 – Development in Floodplain Zones: The County shall regulate development in the 100-year floodplain zones as designated on maps prepared by FEMA in accordance with the following: 1. Critical facilities (those facilities which should be open and accessible during emergencies) shall not be permitted. 2. Passive recreational activities (those requiring non-intensive development, such as hiking, horseback riding, picnicking) are permissible. 3. New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, infrastructure, and ensure safe access and evacuation during flood conditions.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of flood control. The Project would comply with FEMA and County regulations.
HS-5.4 – Multi-Purpose Flood Control Measures: The County shall encourage multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks, and lakes. Where appropriate, the County shall also encourage the use of flood and/or storm water retention facilities for use as groundwater recharge facilities.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control. Groundwater recharge and infiltration galleries would also be part of the Project. The Project would comply with FEMA and County regulations.
HS-5.5 – Development in Dam and Seiche Inundation Zones: The County shall review projects for their exposure to inundation due to dam failure. If a project presents a direct threat to human life, appropriate mitigation measures shall be taken, including restriction of development in the subject area.	**The Project is consistent with this policy:** The Project is located below the Lake Kaweah dam but one of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control. The Project would comply with FEMA and County regulations (Refer to Section 3.7 – Hydrology/Water Quality).

Policy	Consistency Analysis
HS-5.6 – Impacts to Downstream Properties: The County shall ensure that new County flood control projects will not adversely impact downstream properties or contribute to flooding hazards.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control. Groundwater infiltration ponds would also be part of the Project. The Project would comply with FEMA and County regulations (Refer to Section 3.7 – Hydrology/Water Quality).
HS-5.9 – Floodplain Development Restrictions: The County shall ensure that riparian areas and drainage areas within 100-year floodplains are free from development that may adversely impact floodway capacity or characteristics of natural/riparian areas or natural groundwater recharge areas.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control. The DEIR evaluated potential impacts to the riparian areas (Refer to Section 3.2 – Biological Resources) and groundwater (Refer to Section 3.7 – Hydrology/Water Quality). Groundwater recharge would not be significantly interrupted and offsite groundwater elevations would not be expected to change noticeably.
HS-5.10 – Flood Control Design: The County shall evaluate flood control projects involving further channeling, straightening, or lining of waterways until alternative multipurpose modes of treatment, such as wider berms and landscaped levees, in combination with recreation amenities, are studied.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control. However, the Project would not impact the existing channels or floodways of the adjacent rivers.
HS-5.11 – Natural Design: The County shall encourage flood control designs that respect natural curves and vegetation of natural waterways while retaining dynamic flow and functional integrity.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood control.
HS-6: To minimize the exposure of County residents, visitors, and public and private property to the effects of urban and wildland fires.	

Policy	Consistency Analysis
HS-6.2 – Development in Fire Hazard Zones: The County shall ensure that development in very high or high fire hazard areas is designed and constructed in a manner that minimizes the risk from fire hazards and meets all applicable State and County fire standards. This shall include promoting the use of fire resistant materials designed to reduce fire vulnerability within high or very high fire hazard areas through use of Article 86-A of the 2001 California Fire Code, SRA Fire Safe Regulations, and other nationally recognized standards, as may be updated periodically. Special consideration shall be given to the use of fire-resistant-materials and fire-resistant construction in the underside of eaves, balconies, unenclosed roofs and floors, and other similar horizontal surfaces in areas with steep slopes. Ensure new development proposals contain specific fire protection plans, actions, and codes for fire engineering features for structures in Very High Fire Hazard Safety Zones including automatic sprinklers as required by applicable codes.	**The Project is consistent with this policy:** Per Figure 10-2 in the County General Plan, the Project site is located within an area designated as "Non-Fuel" or "Moderate" Fire Threat. The Project site is not located within a County-designated "High" or "Very High" Fire Threat area, nor is it locate within a State Responsibility Area (SRA). In addition, once the reservoir is constructed, it would act as a fire break to help prevent the spread of a wildfire.
HS-6.6 – Wildland Fire Management Plans: The County shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads.	**The Project is consistent with this policy:** As discussed above, the Project site is not located within a County or State fire hazard area. Additionally, the Project site is not adjacent to wildlands or open spaces with high fuel loads.
HS-6.7 – Water Supply System: The County shall require that water supply systems be adequate to serve the size and configuration of land developments, including satisfying fire flow requirements. Standards as set forth in the subdivision ordinance shall be maintained and improved as necessary.	**The Project is consistent with this policy:** The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies via water re-regulation. As such, the Project would enhance local water supply systems and satisfy local fire flow requirements.
HS-8: To protect County residents and visitors from the harmful effects of excessive noise while promoting the County economic base.	
HS-8.2 – Noise Impacted Areas: The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB L_{dn} (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measures NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise). There would be no need for the County to designate the Project area as noise-impacted.

Policy	Consistency Analysis
HS-8.3 – Noise Sensitive Land Uses: The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB L_{dn} (or CNEL) or less within outdoor activity areas and 45 dB L_{dn} (or CNEL) or less within interior living spaces.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is are designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.5 – State Noise Standards: The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Section 35 of the Uniform Building Code (UBC). Title 24 requires that interior noise levels not exceed 45 dB L_{dn} (or CNEL) with the windows and doors closed within new developments of multi-family dwellings, condominiums, hotels, or motels. Where it is not possible to reduce exterior noise levels within an acceptable range the County shall require the application of noise reduction technology to reduce interior noise levels to an acceptable level.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.6 – Noise Level Criteria: The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels, including consistency with CONC, except at one receptor. Mitigation Measure NO-1 through NO24 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.8 – Adjacent Uses: The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB L_{dn} (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measures NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor.

Policy	Consistency Analysis
HS-8.10 – Automobile Noise Enforcement: The County shall encourage the CHP, Sheriff's office, and local police departments to actively enforce existing sections of the California Vehicle Code relating to adequate vehicle mufflers, modified exhaust systems, and other amplified noise.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors and also address noise associated with equipment and vehicles. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.11 – Peak Noise Generators: The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels (daytime and nighttime levels) except at one receptor. Mitigation Measure NO-1 through NO24 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.13 – Noise Analysis: The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 of the Health and Safety Element).	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted and prepared by a Registered Professional Engineer in the State of California. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.14 – Sound Attenuation Features: The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).

Policy	Consistency Analysis
HS-8.16 – State Noise Insulation: The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Section 35 of the Uniform Building Code.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
HS-8.18 – Construction Noise: The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7 pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor. Mitigation Measure NO-1 through NO-2 includes limitations as to when excavation activities can take place (Refer to Section 3.9 – Noise).
HS-8.19 – Construction Noise Control: The County shall ensure that construction contractors implement best practices guidelines (i.e., berms, screens, etc.) as appropriate and feasible to reduce construction-related noise-impacts on surrounding land uses.	**The Project is consistent with this policy:** As part of the CEQA process a noise evaluation was conducted. The evaluation included noise measurements at or near offsite receptors. The noise study determined that the Project would not exceed regulatory noise levels except at one receptor. Mitigation Measure NO-1 through NO-2 is designed to mitigate noise impacts at the one receptor (Refer to Section 3.9 – Noise).
Water Resources	
WR-1: To provide for the current and long-range water needs of the County and for the protection of the quality and quantity of surface and groundwater resources.	

Policy	Consistency Analysis
WR-1.1 – Groundwater Withdrawal: The County shall cooperate with water agencies and management agencies during land development processes to help promote an adequate, safe, and economically viable groundwater supply for existing and future development within the County. These actions shall be intended to help the County mitigate the potential impact on groundwater resources identified during planning and approval processes.	**The Project is consistent with this policy:** The Central Valley Regional Water Quality Control Board (CVRRWQCB) is a responsible agency in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater. As part of the CEQA process a hydrology and water quality evaluation was conducted. It included field studies to identify baseline groundwater conditions. Prior to the installation of the slurry wall or clay liner, any groundwater seepage would be collected and re-infiltrated back to the aquifer by using infiltration galleries. Recharge would not be significantly interrupted nor would offsite groundwater elevations be noticeably changed (Refer to Section 3.7 – Hydrology/Water Quality).
WR-1.5 – Expand Use of Reclaimed Wastewater: To augment groundwater supplies and to conserve potable water for domestic purposes, the County shall seek opportunities to expand groundwater recharge efforts.	**The Project is consistent with this policy:** The CVRRWQCB is a responsible agency in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater. As part of the CEQA process a hydrology and water quality evaluation was conducted. It included field studies to identify baseline groundwater conditions. Prior to the installation of the slurry wall or clay liner, any groundwater seepage would be collected and re-infiltrated back to the aquifer by using infiltration galleries. Recharge would not be significantly interrupted nor would offsite groundwater elevations be noticeably changed (Refer to Section 3.7 – Hydrology/Water Quality).

Policy	Consistency Analysis
WR-1.10 – Channel Modification: Channel modification shall be discouraged in streams and rivers where it increases the rate of flow, rate of sediment transport, erosive capacity, have adverse effect on aquatic life or modify necessary groundwater recharge.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood prevention. The CVRRWQCB, California Department of Fish and Wildlife (CDFW), US Army Corp of Engineers are responsible agencies and, as appropriate, are closely involved in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater and surface water. As part of the CEQA process a hydrology and water quality evaluation was conducted. The Project would obtain the necessary permits and approvals and would implement a SPCC Plan, SWPPP and other Best Management Practices (BMPs) as required by the regulatory agencies (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2: To provide for the current and long-range water needs of the County and for the protection of the quality of surface water and groundwater resources.	
WR-2.1 – Protect Water Quality: All major land use and development plans shall be evaluated as to their potential to create surface and groundwater contamination hazards from point and non-point sources. The County shall confer with other appropriate agencies, as necessary, to assure adequate water quality review to prevent soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products, or wastes; floating debris; and runoff from the site.	**The Project is consistent with this policy:** The CVRRWQCB, CDFW, US Army Corp of Engineers are responsible agencies and, as appropriate, are closely involved in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater and surface water. As part of the CEQA process a hydrology and water quality evaluation was conducted. The Project would obtain the necessary permits and approvals and would implement a SPCC Plan, SWPPP and other BMPs as required by the regulatory agencies (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2.2 – National Pollutant Discharge Elimination System (NPDES) Enforcement: The County shall continue to support the State in monitoring and enforcing provisions to control non-point source water pollution contained in the U.S. EPA NPDES program as implemented by the Water Quality Control Board.	**The Project is consistent with this policy:** The CVRRWQCB, CDFW, US Army Corp of Engineers are responsible agencies and, as appropriate, are closely involved in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater and surface water. As part of the CEQA process a hydrology and water quality evaluation was conducted. A SWPPP would be prepared in accordance with the NPDES Industrial General Permit (IGP) and BMPs would be implemented.

Policy	Consistency Analysis
WR-2.3 – Best Management Practices (BMPs): The County shall continue to require the use of feasible BMPs and other mitigation measures designed to protect surface water and groundwater from the adverse effects of construction activities, agricultural operations requiring a County Permit and urban runoff in coordination with the Water Quality Control Board.	**The Project is consistent with this policy:** The Project would comply with NPDES requirements. A SWPPP would be prepared in accordance with the IGP and BMPs would be implemented (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2.4 – Construction Site Sediment Control: The County shall continue to enforce provisions to control erosion and sediment from construction sites.	**The Project is consistent with this policy:** The Project would comply with NPDES requirements. A SWPPP would be prepared in accordance with the IGP and BMPs would be implemented, including those associated with sediment control (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2.5 – Major Drainage Management: The County shall continue to promote protection of each individual drainage basin within the County based on the basins unique hydrologic and use characteristics.	**The Project is consistent with this policy:** The CVRRWQCB is a responsible agency under CEQA. The Project would comply with NPDES requirements. A SWPPP would be prepared in accordance with the IGP and BMPs would be implemented (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2.6 – Degraded Water Resources: The County shall encourage and support the identification of degraded surface water and groundwater resources and promote restoration where appropriate.	**The Project is consistent with this policy: :** The CVRRWQCB, CDFW, US Army Corp of Engineers are responsible agencies and, as appropriate, are closely involved in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater and surface water. As part of the CEQA process a hydrology and water quality evaluation was conducted. The Project would not degrade surface water or groundwater resources. The Project would comply with NPDES requirements. A SWPPP would be prepared in accordance with the IGP and BMPs would be implemented (Refer to Section 3.7 – Hydrology/Water Quality).

Policy	Consistency Analysis
WR-2.7 – Industrial and Agricultural Sources: The County shall work with agricultural and industrial concerns to ensure that water contaminants and waste products are handled in a manner that protects the long-term viability of water resources in the County.	**The Project is consistent with this policy:** The CVRRWQCB, CDFW, US Army Corp of Engineers are responsible agencies and, as appropriate, are closely involved in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater and surface water. As part of the CEQA process a hydrology and water quality evaluation was conducted. The Project would not contaminate surface or groundwaters resources. The Project would comply with NPDES requirements. A SWPPP would be prepared in accordance with the IGP and BMPs would be implemented (Refer to Section 3.7 – Hydrology/Water Quality).
WR-2.8 – Point Source Control: The County shall work with the Regional Water Quality Control Board to ensure that all point source pollutants are adequately mitigated (as part of the California Environmental Quality Act review and project approval process) and monitored to ensure long-term compliance.	**The Project is consistent with this policy:** The CVRRWQCB is a responsible agency in the CEQA process**.** The Project would comply with all applicable requirements associated with groundwater. As part of the CEQA process a hydrology and water quality evaluation was conducted. It included field studies to identify baseline groundwater conditions (Refer to Section 3.7 – Hydrology/Water Quality).
WR-3: To provide a sustainable, long-term supply of water resources to meet domestic, agricultural, industrial, and recreational needs and to assure that new urban development is consistent with available water resources.	
WR-3.1 – Develop Additional Water Sources: The County shall encourage, support and, as warranted, require the identification and development of additional water sources through the expansion of water storage reservoirs, development of groundwater banking for recharge and infiltration, and promotion of water conservation programs, and support of other projects and programs that intend to increase the water resources available to the County and reduce the individual demands of urban and agricultural users.	**The Project is consistent with this policy:** One of the objectives of the Project is to capture and re-regulate water in order to manage water supplies to increase the long-term availability of irrigation supplies, and groundwater recharge supplies (Refer to Section 3.7 – Hydrology/Water Quality).
WR-3.3 – Adequate Water Availability: The County shall review new development proposals to ensure the intensity and timing of growth will be consistent with the availability of adequate water supplies. Projects must submit a Will-Serve letter as part of the application process, and provide evidence of adequate and sustainable water availability prior to approval of the tentative map or other urban development entitlement.	**The Project is consistent with this policy:** One of the main Project objectives and benefits is to capture and re-regulate flows of the Lower Kaweah River and the St. Johns River for purposes of storm water layoff and flood prevention. Therefore, the Project would be consistent with the availability of adequate water supplies, and would potentially increase the local water supply available to local agriculture.

Policy	Consistency Analysis
WR-3.5 – Use of Native and Drought Tolerant Landscaping: The County shall encourage the use of low water consuming, drought-tolerant and native landscaping and emphasize the importance of utilizing water conserving techniques, such as night watering, mulching, and drip irrigation.	**The Project is consistent with this policy:** No landscaping is proposed as part of the Project.
WR-3.10 – Diversion of Surface Water: Diversions of surface water or runoff from precipitation should be prevented where such diversions may cause a reduction in water available for groundwater recharge.	**The Project is consistent with this policy.** One of the objectives of the Project is to capture and re-regulate water in order to manage water supplies to increase the long-term availability of irrigation supplies, and groundwater recharge supplies (Refer to Section 3.7 – Hydrology/Water Quality).
Transportation & Circulation	
TC-1: To promote an efficient roadway and highway system for the movement of people and goods, which enhances the physical, economic, and social environment while being safe, environmentally friendly, and cost-effective.	
TC-1.14 – Roadway Facilities: As part of the development review process, new development shall be conditioned to fund, through impact fees, tonnage fees, and/or other mechanism, the construction and maintenance of roadway facilities impacted by the project. As projects or locations warrant, construction or payment of pro-rata fees for planned road facilities may also be required as a condition of approval.	**The Project is consistent with this policy:** As discussed in Section 1.0 – Introduction, the Project would not result in additional vehicles/trucks on offsite public roadways.
TC-1.15 – Traffic Impact Study: The County shall require an analysis of traffic impacts for land development projects that may generate increased traffic on County roads. Typically, applicants of projects generating over 100 peak hour trips per day or where LOS "D" or worse occurs, will be required to prepare and submit this study. The traffic impact study will include impacts from all vehicles, including truck traffic.	**The Project is consistent with this policy:** As discussed in Section 1.0 – Introduction, the Project would not result in additional vehicles/trucks on offsite public roadways. Additionally, there are no proposed changes to the existing Project access routes connecting to arterial roads. Regardless, a traffic analysis technical memorandum was prepared to further document that the Project would not have an impact on offsite traffic or Level of Service (LOS) (see Appendix I).

Policy	Consistency Analysis
TC-1.16 – County Level of Service (LOS) Standards: The County shall strive to develop and manage its roadway system (both segments and intersections) to meet a LOS of "D" or better in accordance with the LOS definitions established by the Highway Capacity Manual.	**The Project is consistent with this policy:** As discussed in Section 1.0, the Project would not result in additional vehicles/trucks on offsite public roadways. Therefore, the Project would not impact existing LOS on County roadways. Regardless, a traffic analysis technical memorandum was prepared to further document that the Project would not have an impact on offsite traffic or LOS (see Appendix I).
TC-3: To enhance airports in the County to meet the County's changing needs and demands while minimizing adverse airport related environmental impacts and safety hazards.	
TC-3.4 – Airport Compatibility: Protect existing and future airport operations from encroachment by potentially incompatible land uses and require developers to file an aviation easement with the County if a proposed development or expansion of an existing use is located within the approach or approach transition zones designation in the Tulare County Comprehensive Airport Land Use Plan.	**The Project is consistent with this policy:** Per the Tulare County Comprehensive Airport Land Use Plan, the Project site is not located within the approach or approach transition zone of a County airport.
Public Facilities & Safety	
PFS-1: To establish and maintain acceptable levels of service, minimize costs, and provide criteria for determining the location, capacity, and timing of existing and future public facilities and services.	
PFS-1.2 – Maintain Existing Levels of Services: The County shall ensure new growth and developments do not create significant adverse impacts on existing County-owned and operated facilities.	**The Project is consistent with this policy:** Through the CEQA, SMARA and County review and approval process, the County shall ensure the Project would not create significant adverse impacts on existing County-owned and operated facilities.
PFS-1.3 – Impact Mitigation: The County shall review development proposals for their impacts on infrastructure (for example, sewer, water, fire stations, libraries, streets, etc). New development shall be required to pay its proportionate share of the costs of infrastructure improvements required to serve the project to the extent permitted by State law. The lack of available public or private services or adequate infrastructure to serve a project, which cannot be satisfactorily mitigated by the project, may be grounds for denial of a project or cause for the modification of size, density, and/or intensity of the project.	**The Project is consistent with this policy:** The Project would not impact existing County infrastructure (e.g., sewer, water, fire stations, libraries, streets, etc.), nor would it require the County to construct new or expand existing infrastructure. Through the CEQA, SMARA and County review and approval process, the County shall ensure the Project is sufficient served by existing infrastructure.

Policy	Consistency Analysis
PFS-1.4 – Standards of Approval: The County should not approve any development unless the following conditions are met: 1. The applicant can demonstrate all necessary infrastructure will be installed and adequately financed, 2. Infrastructure improvements are consistent with adopted County infrastructure plans and standards, and 3. Funding mechanisms are provided to maintain, operate, and upgrade the facilities throughout the life of the project.	**The Project is consistent with this policy:** The Project would not require the expansion existing or installation of new infrastructure. Through the CEQA, SMARA and County review and approval process, the County shall ensure the Project is sufficient served by existing infrastructure.
PFS-2: To ensure the provision of a reliable, safe, and adequate supply of high quality water as well as effective distribution and storage facilities to meet the existing and future needs in the County.	
PFS-2.2 – Adequate Systems: The County shall review new development proposals to ensure that the intensity and timing of growth will be consistent with the availability of adequate production and delivery systems. Projects must provide evidence of adequate system capacity prior to approval.	**The Project is consistent with this policy:** The Project would not require the expansion existing or installation of new water infrastructure. The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies via water re-regulation. This would help the County in their goal to provide reliable, safe, and adequate supply of high-quality water to meet the regional needs.
PFS-2.3 – Well Testing: The County shall require new development that includes the use of water wells to be accompanied by evidence that the site can produce the required volume of water without impacting the ability of existing wells to meet their needs.	**The Project is consistent with this policy:** A hydrologic study was prepared to evaluate potential impacts on local wells and it was demonstrated that the Project would not impact exiting nearby water wells (see Appendix G). A groundwater well would be installed in accordance with County rules and regulations.
PFS-3: To ensure the provision of adequate wastewater collection, treatment, and disposal within the County.	
PFS-3.2 – Adequate Capacity: The County shall require development proposals to ensure the intensity and timing of growth is consistent with the availability of adequate wastewater treatment and disposal capacity.	**The Project is consistent with this policy:** The Project would not require any new wastewater treatment facilities. Therefore, the Project would no impact the County's existing disposal capacity.
PFS-4: To ensure the management of stormwater in a safe and environmentally sensitive manner through the provision of adequate storm drainage facilities that protect people and property.	

Policy	Consistency Analysis
PFS-4.3 – Development Requirements: The County shall encourage project designs that minimize drainage concentrations and impervious coverage, avoid floodplain areas, and where feasible, provide a natural watercourse appearance.	**The Project is consistent with this policy:** The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies. No impervious surfaces are proposed, and, once constructed, the reservoir would have a natural appearance consistent with the surrounding landscape.
PFS-5: To ensure the safe and efficient disposal and recycling of solid and hazardous waste generated in the County.	
PFS-5.6 – Ensure Capacity: The County shall require evidence that there is adequate capacity within the solid waste system for the processing, recycling, transmission, and disposal of solid waste prior to approving new development.	**The Project is consistent with this policy:** Project would not generate significant quantities of solid waste. The County's existing solid waste disposal infrastructure is sufficient to serve the proposed Project.
PFS-5.8 – Hazardous Waste Disposal Capabilities: The County shall require the proper disposal and recycling of hazardous materials in accordance with the County's Hazardous Waste Management Plan.	**The Project is consistent with this policy:** Project is not expected to generate hazardous waste. If generated, hazardous waste would be properly stored and disposed of in accordance with the County's Hazardous Waste Management Plan. A HMBP and Contingency Plan, SWPPP and SPCC have been prepared for the Project.
PFS-7: To provide adequate fire and law enforcement facilities and services to ensure the safety of County residents and the protection of County property.	
PFS-7.2 – Fire Protection Standards: The County shall require all new development to be adequately served by water supplies, storage, and conveyance facilities supplying adequate volume, pressure, and capacity for fire protection.	**The Project is consistent with this policy:** The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies via water re-regulation. As such, the Project would enhance local water supply systems. Existing fire protection infrastructure would be sufficient to serve the Project.
Part II – Area Plan Policies	
Rural Valley Lands Plan Policies	
RVLP-1: To sustain the viability of Tulare County's agriculture by restraining division and use of land which is harmful to continued agricultural use of non-replaceable resources.	

Policy	Consistency Analysis
RVLP-1.4 – Determination of Agriculture Land: The County shall not allow re-zoning of parcels that accumulate 17 or more points according to the RVLP Development Criteria (contained in Section 1.3 of this chapter). If the number of points accumulated is 11 or less, the parcel may be considered for non-agricultural zoning. A parcel receiving 12 to 16 points shall be determined to have fallen within a "gray" area in which no clear cut decision is readily apparent. In such instances, the Planning Commission and Board of Supervisors shall make a decision based on the unique circumstances pertaining to the particular parcel of land, including factors not covered by this system.	**The Project is consistent with this policy:** The Project is located in an area designated Valley Agriculture, Mineral Resources Zone (MRZ-2b), as well as Grazing Land per the FMMP. The Project site is zoned AE-20. The Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to non-agricultural activities. The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies. As discussed in Section 3.11.2.3, the Project would not re-zone any parcels, and the proposed use (i.e., aggregate extraction and water storage reservoir) is an allowable use in the AE-20 zone upon "approval of a reclamation plan and approval of financial assurances".

Based on the consistency evaluation provided in Table 3.11-2 above, the Project does not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.11.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative

analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in this Section, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies, which is summarized in Table 3.11-2. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to land use and planning.

3.12 MINERAL RESOURCES

3.12.1 Introduction

This section of the DEIR presents a discussion of mineral resources. A review of potential Project impacts is provided in the following analysis.

3.12.2 Environmental Setting

3.12.2.1 Regional and Local Setting

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20 Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). The State Geologist, in accordance with the State Board's Guidelines for Classification and Designation of Mineral Lands, has classified the underlying land as MRZ-2b, which includes:

> *Areas underlain by mineral deposits where geologic data indicate that significant inferred resources are present. Areas classified MRZ-2b contain discovered mineral deposits that are either significant inferred resources or indicated reserves. Land included in MRZ-2b is of importance because it contains potential economic mineral deposits.*

An example of loss of availability in this instance would be the development of residential housing atop an area classified by the State Geologist as MRZ-2b. The excavation of lands so classified, and the subsequent processing of the resulting materials, is the utilization of such resources, which is consistent with an MRZ-2b classification.

3.12.3 Regulatory Setting

The Project is subject to a variety of land use regulatory requirements and designations, which are discussed fully in the sections to follow.

3.12.3.1 Federal

There are no federal mineral resource regulations that directly affect the Project.

3.12.3.2 State

Surface Mining and Reclamation Act (SMARA)

Even though the Project is the construction and operation of a water storage and re-regulation reservoir, it is located within a designated MRZ zone. A MRZ zone is a designation by the State Mining and Geology Board (SMGB) that classifies the area as containing a mineral resource of regional or statewide significance. Because the sand and gravel (aggregate) located underneath the Project site is considered a high-quality aggregate and the Tulare County needs aggregate for construction materials, it is reasonable to use the material excavated for the construction of the reservoir as a marketable product. Therefore, West Coast Sand and Gravel (WCSG) (i.e., an aggregate mining company) has been contracted to excavate the aggregate beneath the Project site and process it at their facility on the Seaborn site such that it could be sold as high-quality construction grade aggregate. This would be beneficial to both the county and the

Project. However, by doing this, the Project would be subject to the Surface Mining and Reclamation Act (SMARA).

The County of Tulare (specifically, the Tulare County Resource Management Agency (RMA)) allows mining and the extraction of minerals via permits within the AE-20 zone upon "*approval of a reclamation plan and approval of financial assurances*" (Tulare County Ordinance Code, Section 7-25-1085). Tulare County Ordinance Code Section 7-25-1020 provides that "*appurtenant uses*" typical of a surface mining operation "*may be permitted through the surface mining permit approved for surface mining operations in lieu of requiring a special use permit, when such uses are found by the Planning Commission to be a reasonably necessary adjunct to the mining operations.*" (Tulare County).

California's Surface Mining and Reclamation Act (SMARA) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized, and mined lands are reclaimed to a usable condition. SMARA's Section 2762(a) requires the SMARA Lead Agency (in this case, the County of Tulare for this Project) to:

> *"…establish mineral resource management policies to be incorporated in its general plan which will:*
>
> *(1) Recognize mineral information classified by the State Geologist and transmitted by the board.*
>
> *(2) Assist in the management of land use which affect areas of statewide and regional significance.*
>
> *(3) Emphasize the conservation and development of identified mineral deposits."*

SMARA requires the following be approved by the SMARA lead agency (the County) and requires the concurrence from Department of Mine Reclamation (DMR) before mining may begin:

- Surface Mining Permit;
- Reclamation Plan; and
- Financial Assurance Mechanism.

SMARA §2773.1(a)(3) requires that the financial assurances for each mining operation be adjusted annually to account for new lands disturbed, inflation, and reclamation of lands accomplished in accordance with SMARA and the site's approved reclamation plan. Section 3804 of the State regulations states: "The financial assurance amount shall be calculated and based on (1) an analysis of the physical activities and materials necessary to implement the approved reclamation plan; (2) the lead agency's unit costs, or costs for third party contracting, for each of these activities, if applicable, (3) the number of units of each of these activities, if applicable; (4) a contingency amount not to exceed 10% of the reclamation cost. The calculated amount should not include the cost of completing mining of the site." In order to meet the SMARA requirement, surface mining operators must submit a Financial Assurance Cost Estimate (FACE) each year.

3.12.3.3 Local

County of Tulare – General Plan

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that potentially relate to the proposed Project are listed below.

> ***ERM-2.1 Conserve Mineral Deposits:*** *The County will encourage the conservation of identified and/or potential mineral deposits, recognizing the need for identifying, permitting, and maintaining a 50-year supply of locally available PCC grade aggregate.*
>
> ***ERM-2.3 Future Resource Development:*** *The County will provide for the conservation of identified and/or potential mineral deposits within Tulare County as areas for future resource development. Recognize that mineral deposits are significantly limited within Tulare County and that they play an important role in support of the economy of the County.*
>
> ***ERM-2.10 Incompatible Development:*** *Proposed incompatible land uses in the County shall not be on lands containing or adjacent to identified mineral deposits, or along key access roads, unless adequate mitigation measures are adopted or a statement of overriding considerations stating public benefits and overriding reasons for permitting the proposed use are adopted.*
>
> ***ERM-4.6 Renewable Energy:*** *Proposed incompatible land uses in the County shall not be on lands containing or adjacent to identified mineral deposits, or along key access roads, unless adequate mitigation measures are adopted or a statement of overriding considerations stating public benefits and overriding reasons for permitting the proposed use are adopted.*

3.12.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Mineral Resources" a project is considered to have a significant impact on the environment if it would:

a) *Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state (CEQA Appendix G Threshold (a))?*

b) *Result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan (CEQA Appendix G Threshold (b))?*

3.12.5 Methodology of Analysis

The following points were considered in the mineral resource evaluation:

- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- In identifying the area underlying the Project site as MRZ-2b, the State of California and the County General Plan have determined this area contains mineral deposits where geologic data show that significant measured or indicated resources are present, or where geologic

information indicates that significant inferred resources are present. Land included in the MRZ-2b category is of prime importance because it contains known economic mineral deposits. A typical MRZ-2b area would include an operating mine, or an area where extensive sampling indicates the presence of a significant mineral deposit. This site is also designated by the State as having aggregate deposits of regional significance.

3.12.6 Project-Level Impacts and Mitigation Measures

3.12.6.1 Loss of Availability of a Known Mineral Resource

Impact Statement

Impact MIN-1: *Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

Implementation of the Project would not result in the loss of availability of a known mineral resource that is either locally-important or of value to the residents in the region or the State. Rather, as a result of the need to excavate the Project site in order to construct the reservoir, the Project proposes to develop this resource.

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20 Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). The State Geologist, in accordance with the State Board's Guidelines for Classification and Designation of Mineral Lands, has classified the underlying land as MRZ-2b, which includes:

> *Areas underlain by mineral deposits where geologic data indicate that significant inferred resources are present. Areas classified MRZ-2b contain discovered mineral deposits that are either significant inferred resources or indicated reserves. Land included in MRZ-2b is of importance because it contains potential economic mineral deposits.*

An example of loss of availability in this instance would be the development of residential housing atop an area classified by the State Geologist as MRZ-2b. The excavation of lands so classified, and the subsequent processing of the resulting materials, is the utilization of such resources, which is consistent with an MRZ-2b classification.

The Project would have no impact on mineral resources.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.12.6.2 Conflict with Applicable Plans, Policies or Regulations

Impact Statement

Impact MIN-2: *Would the Project result in the loss of availability of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

See Section 3.12.6.1, above. Implementation of the Project would not result in the loss of availability of a known mineral resource that is either locally-important or of value to the residents in the region or the State. Rather, as a result of the need to excavate the Project site in order to construct the reservoir, the Project proposes to develop this resource.

The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone, 20 Acre Minimum), with a General Plan designation of Valley Agriculture, Mineral Resource Area (MRZ-2b). An example of loss of availability in this instance would be the development of residential housing atop an area classified by the State Geologist as MRZ-2b. The excavation of lands so classified, and the subsequent processing of the resulting materials, is the utilization of such resources, which is consistent with an MRZ-2b classification.

The Project would have no impact on mineral resources.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.12.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project (2 are existing aggregate mining operations, and 1 is a community plan update) while three (3) other projects are located within 3 miles of the Project (1 existing aggregate mining operation, 1 residential sub-division, and 1 stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in this Section, the Project would not result in the loss of availability of a known mineral resource that would be of value to the region and residents of the Tulare County or result in the loss of a locally-important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan. Conversely, the Project would facilitate the utilization of such resources, which is consistent with an MRZ-2b classification. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to mineral resources.

3.13 NOISE

3.13.1 Introduction

This section discusses the existing noise environment in the vicinity of the Project site and quantifies the potential noise impacts that may result from implementation of the Project. Analysis in this section is based on the State CEQA Guidelines (CCR Section 15000 et. Seq.), the Tulare County General Plan – 2030 Update (Tulare County, 2012), and other applicable federal and state guidelines related to noise and vibration. A Noise Impact Assessment (NIA) prepared by Sespe Consulting, Inc. (Sespe Consulting, Inc., 2021) is included in Appendix H and provides additional technical analysis.

3.13.1.1 Characteristics of Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second) they can be heard by the human ear and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure requires use of a large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the human hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 decibels (dB). Other sound pressure levels are divided by the reference pressure, and the logarithm is used to keep the dB values within a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness as presented in Table 3.13-1.

The perceived loudness of sound is dependent upon many factors, including sound pressure level (i.e., amplitude) and frequency of the sound waveform. However, within the usual range of environmental noise levels, frequency perception of loudness is relatively predictable, and can be approximated by weighing the sound level pressures between 1,000 and 5,000 Hz, which are the most sensitive frequencies perceived by a healthy human ear and coincidentally span the natural frequency range of human speech. This weighting comes in several varieties used for different purposes, but the A-weighting scale is applicable here. There is a strong correlation between A-weighted sound levels (expressed as dBA) and human response to noise. For this reason, the A-weighted sound level is the standard for environmental noise regulations and impact assessments. Noise levels reported in this section are A-weighted levels as required for comparison to applicable thresholds. Table 3.13-1 provides sound pressure levels of typical noise sources in units of dBA and micropascals (µPa) of pressure.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour or less). The L_{eq} is also the foundation of the Day-Night Average Level (L_{dn}) and the Community Noise Equivalent Level (CNEL) noise descriptors presented below, each of which has a strong correlation with community response to noise. The maximum sound level (L_{max}) represents the highest

instantaneous noise level recorded over a given time period (usually one hour or less), and may also be utilized to assess noise impacts.

Table 3.13-1. Typical A-Weighted Sound Levels of Common Noise Sources

Loudness Ratio	Micropascals (µPa)	dBA	Description
128	63,245,553	130	Threshold of Pain
64	20,000,000	120	Jet aircraft Take-Off at 100 feet
32	6,324,555	110	Riveting Machine at Operator's Position
16	2,000,000	100	Shotgun at 200 feet
8	632,456	90	Bulldozer at 50 feet
4	200,000	80	Diesel Locomotive at 300 feet
2	63,246	70	Commercial Jet Aircraft Interior During Flight
1	20,000	60	Normal Conversation Speech at 5-10 feet
0.5	6,325	50	Open Office Background Level
0.25	2,000	40	Background Level Within a Residence
0.125	632	30	Soft Whisper at 2 feet
0.0625	200	20	Interior of Recording Studio

Source: (US EPA, 1971) and (Federal Interagency Committee on Noise, 1992).

The Day-Night Average Level (L_{dn}) is the weighted average noise level over a 24-hour day, with a +10 dB penalty applied to noise occurring at night (10:00 p.m. to 7:00 a.m.). The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to smooth out short-term variations in the noise environment. L_{dn} based noise standards are commonly used to assess noise impacts associated with variable noise sources, such as transportation sources (i.e., traffic, railroad and aircraft noise).

Similar to L_{dn}, Community Noise Equivalent Level (CNEL) is also based upon the weighted average noise level over a 24-hour day, with a +5 dB penalty applied to noise during the evening (7:00 p.m. to 10:00 a.m.) and a +10 decibel penalty applied to noise during the night (10:00 p.m. to 7:00 a.m.). These penalties or weightings account for the noise sensitive time periods during the evening and night hours, when people are generally at home, possibly sleeping, and more sensitive to sound.

The maximum sound level (L_{max}) presents the highest instantaneous noise level recorded over a given time period (usually one hour or less) and is useful because it captures short and/or intermittent noise sources (e.g., railroads, aircraft noise) within a noise environment, which are of objectionable amplitude but would be lost with average L_{dn} or CNEL noise descriptors.

3.13.1.2 Characteristics of Groundborne Vibration

Vibration is like noise transmitted through movement of the ground rather than the air. Both involve a source, a transmission path, and a receptor. Both noise and vibration consist of a pressure value having an amplitude and frequency. A person's response to vibration depends on their individual sensitivity as

well as the amplitude and frequency of the source. Additionally, damage to structures can occur when exposed to groundborne vibration.

Vibration is usually described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of peak particle velocity (PPV), usually measured in inches per second (in/sec). Standards pertaining to human perception and damage to structures are expressed in terms of PPV. Although aggregate mining and processing vibration levels for this Project would be minimal due to the relatively large distances from Project sources to acoustically sensitive receptors, and the absence of blasting, an assessment of vibration levels at nearby receptors is nonetheless addressed.

According to the California Department of Transportation's (Caltran's) *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020), operation of construction equipment and certain construction techniques (e.g., pile driving) generate groundborne vibration. Traffic on roadways is also a source of vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage (e.g., crack plaster). Ground vibration can also be a source of annoyance to individuals who live and/or work in proximity to vibration-generating activities. Traffic, including heavy duty trucks (i.e., haul trucks) traveling on a highway, rarely generates vibration high enough to cause structural or cosmetic damage.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate by a few ten-thousandths to a few thousandths of an inch. Transmissivity of subsurface geology and distance from the source affect attenuation rate and the intensity of resulting vibration experienced by a receptor. Vibration amplitudes generally decrease with increasing distance. The velocity of particle movement is the commonly accepted descriptor of the vibration "strength." This is referred to as the peak particle velocity (PPV) and is typically measured in a unit of time (e.g., in/sec).

Human response to vibration varies. Vibration can be felt or heard well below the levels that would damage structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

Human and structural responses to vibration are influenced by a number of factors, including geology, construction materials, age of structure, distance between source and receptor, duration, and the number of perceived vibration events.

Table 3.13-2 displays the human response to transient vibration sources (i.e., construction/mobile equipment) in terms of PPV vibration levels.

Table 3.13-2. General Human Responses to Transient Vibration Levels

Human Response to Vibration	Peak Vibration Threshold (in./sec. PPV)
Severe	2.0
Strongly perceptible	0.9
Distinctly perceptible	0.24
Barely perceptible	0.035

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2013).

3.13.2 Environmental Setting

3.13.2.1 Regional Setting

The Project site is located in a semi-rural area of unincorporated Tulare County, in the easterly portion of the San Joaquin Valley, California. The existing ambient noise environment experienced by residential receptors closest to the Project site consists primarily of natural sounds (wind, birds, insects, etc.), local roadway traffic (e.g., SR-228/Lomitas Drive, SR-198/Sierra Drive, etc.), crop dusters/occasional commercial aircraft over-flights, aggregates mining and processing (e.g., Seaborn facility, CEMEX Lemon Cove facility, Kaweah South facility, etc.), and commercial agricultural operations. Nearby urban centers include the census-designated community of Lemon Cove (1.0 miles to the southeast) and the City of Woodlake (2.5 miles to the northwest); however, urban activities from these nearby communities are generally not audible at the Project site. The closest airports/airstrips are the Woodlake Airport, located approximately 2.4 miles away to the west, and the larger Exeter Airport, located approximately 11.3 miles away to the southwest. Neither airport has an appreciable influence on noise levels near the Project site. See Figure 3.13-1 and Figure 3.13-2 below which show the regional location of the Project site as well as nearby receptors of concern.

3.13.2.2 Local Setting

Local Vibration Environment

The existing ambient vibration environment in the immediate Project vicinity is extremely low, as would be expected in typical environments with no appreciable sources of local vibration. During field visits, Sespe staff could not detect any appreciable groundborne vibrations resulting from adjacent land uses, including the nearby aggregate and agricultural operations. Background vibration levels around the Project perimeter are less than the threshold of perception.

Local Noise Environment

The existing ambient noise environment is consistent with that of typical semi-rural areas. As discussed above, existing noise sources near the Project site receptors include equipment noise from aggregates mining and agricultural operations, vehicular noise from adjacent roadways, occasional aircraft over-flights, and natural sounds. The existing aggregate operations and surrounding noise sources constitute the existing physical conditions.

To quantify the existing ambient (i.e., baseline) noise environment experienced by neighboring receptors closest to the Project site, a total of sixteen (16) short-duration (15-minute) measurements and one (1)

long-duration (24-hour) reference noise measurement were collected at ten (10) locations surrounding the Project site on October 21st and 22nd, 2020 (see Figure 3.13-2). The noise measurements were recorded using two (2) Quest DL SoundPro, Type 2 noise meters (Serial #'s BGI04008, BIJ090010). Noise meters were programmed in "slow" mode, in "A" weighted form, and logging every minute. The microphones were equipped with a windscreen during measurements, and noise meters were calibrated using two (2) Quest QC-10 calibrators (Serial #'s QIB070141, QIJ090052) prior to, and following each, measurement taken.

As discussed in Section 3.13.3.3 – Local Regulatory Setting, noise sensitive land uses (i.e., receptors) are defined as "residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses" within the Tulare County General Plan (Tulare County, 2012). Per the County noise standards and General Plan criteria, noise impacts to nearby commercial and industrial receptors, specifically the Seaborn and CEMEX Lemon Cove aggregate facilities, resulting from the Project are not assessed. The locations of the baseline noise measurement and the corresponding Project site receptors are shown on Figure 3.13-2. The long-duration (i.e., 24-hour) measurement represents a receptor (R1), and was also utilized as a reference measurement to quantify the Day-Night Average (L_{dn}) noise levels at the other receptor locations where only short-duration measurements were collected. The details of these calculations are presented in Appendix H.

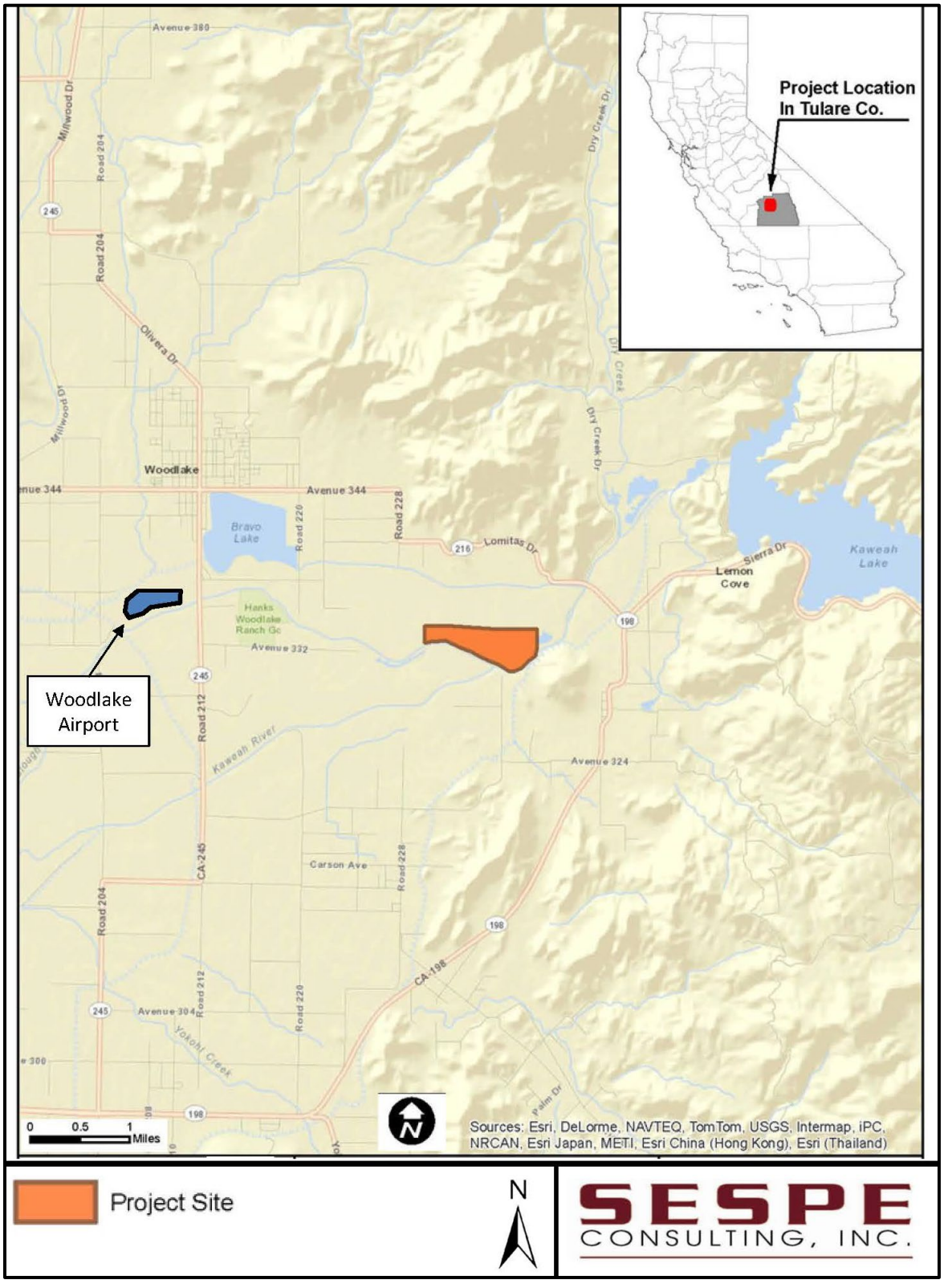
The monitoring locations and associated receptors are provided on Table 3.13-3. The closest relevant receptor in each direction from the Project site was included. Furthermore, measurements at these closest receptors conservatively account for potentially-affected receptors located at locations farther from the Project noise sources. When appropriate, receptors are grouped together and the noise impact at the worst-case portion of the group is determined. See Figure 3.13-2 for the locations of the Project site receptors respectively.

Table 3.13-3. Summary of Monitoring Locations

Receptor	Duration	Date(s) Measured	Time Start	Time Stop	Description
R1	24-hours	10/21/20 10/22/20	1:29 p.m. ---	--- 1:29 p.m.	Residence owned by Tulare Irrigation District (TID), south of Project Site.
R2	30-mins	10/21/20 10/22/20	5:29 p.m. 10:52 a.m.	5:44 p.m. 11:07 a.m.	Residence southwest of Project site, along Road 228.
R3	30-mins	10/21/20 10/22/20	5:08 p.m. 11:18 a.m.	5:23 p.m. 11:33 a.m.	Residence southeast of Project site, along Goodale Lane.
R4	30-mins	10/21/20 10/22/20	4:42 p.m. 11:18 a.m.	4:57 p.m. 11:33 a.m.	Residence(s) east of Project site, adjacent to SR-198.
R5	30-mins	10/21/20 10/22/20	3:27 p.m. 12:06 p.m.	3:42 p.m. 12:21 p.m.	Residence north/northeast of Project site, along a private dirt road connecting to SR-216.
R6	30-mins	10/21/20 10/22/20	3:27 p.m. 12:06 p.m.	3:42 p.m. 12:21 p.m.	Residence north of Project site, along a private dirt road connecting to SR-216.

Receptor	Duration	Date(s) Measured	Time Start	Time Stop	Description
R7	30-mins	10/21/20 10/22/20	3:03 p.m. 12:29 p.m.	3:18 p.m. 12:44 p.m.	Residence north of Project site, along a private dirt road connecting to SR-216.
R8	30-mins	10/21/20 10/22/20	2:43 p.m. 12:53 p.m.	2:58 p.m. 1:08 p.m.	Residence northwest of Project site, along Road 228.
R9	30-mins	10/21/20 10/22/20	5:50 p.m. 1:14 p.m.	6:05 p.m. 1:29 p.m.	Residence(s) west of Project site, along Avenue 335 west of the Seaborn facility.
R10	30-mins	10/21/20 10/22/20	10:25 a.m. 1:34 p.m.	10:40 a.m. 1:49 p.m.	Residence west of Project site, along Avenue 332.

Note: Figure 3.13-2 below shows the receptor locations.



Source: Provost & Pritchard Consulting Group (October 2013)

Figure 3.13-1 Location Map

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Source: *Noise Impact Assessment* (Sespe Consulting, Inc., 2021)

Figure 3.13-2 Noise Receptors & Measurement Locations

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Based on ambient noise measurements taken October 21st and 22nd, 2020, Table 3.13-4 presents the ambient noise levels at the receptors in the Project site vicinity. Noise from the existing aggregate operations is included in the ambient noise levels as the site was operating while the measurements were taken. Noise measurement logs and additional information regarding the background noise level determination are included in Appendix H. Project site monitoring locations are illustrated on Figure 3.13-2.

Long-term (i.e., 24-hour) measurements consist of daytime, evening and nighttime hours, and reveal average L_{eq} and L_{dn} noise levels. One (1) long-term measurement was collected at Receptor 1, a residence that is owned and rented out by the TID. This receptor is in close proximity to the Project site (approximately 250-feet to the south) but far away from any intermittent or high-intensity noise sources (i.e., roads, agricultural and mining operations, etc.), making it generally representative of existing ambient conditions near the Project site. The average hour L_{eq} value from long-term measurements during the applicable measurement periods, as well as the 24-hour L_{dn} are presented below in Table 3.13-4.

To estimate average L_{dn} noise levels for receptors where only short-duration (i.e., 15-minute) measurements were collected (i.e., R2 through R10), L_{eq} measurements collected at the long-duration (24-hour) reference location were compared to L_{eq} measurements at each short-duration receptor location(s) during the same time of day to determine the dBA difference between the two points. For example, Receptor 7 measurements (2 measurements, 15 minutes each) collected between 3:03 p.m. and 3:18 p.m. on 10/21/2020 and 12:29 p.m. and 12:44 p.m. on 10/22/2020, when compared to the L_{eq} values collected at the 24-hour reference point during the same time periods shows a noise level difference of +8.0 dBA and +1.8 dBA respectively (average noise difference equates to +4.9 dBA). This difference between the noise levels can be used as a correction factor, which is utilized to estimate the L_{dn} noise levels at each receptor where only short-duration measurements were collected. Additional details regarding these calculations are included in Appendix H. Using this concept, Table 3.13-4 shows the measured/estimated ambient noise levels (L_{eq} and L_{dn}) at each receptor.

Table 3.13-4. Ambient Noise in Project Site Vicinity (dBA)

Receptor	L_{eq}	Day-Night (L_{dn})
R1	43.8	47.6
R2	44.6	51.7
R3	50.2	59.3
R4	37.8	44.7
R5	56.5	57.4
R6	56.5	57.4
R7	47.0	52.5
R8	46.3	56.0
R9	41.1	51.8
R10	47.0	47.8

Source: Appendix H.

3.13.3 Regulatory Setting

Each level of government has some responsibility for reducing annoyances caused by noise and vibration. Each is discussed below.

3.13.3.1 Federal

The adverse impact of noise was officially recognized by the Federal government in the Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.), which serves three purposes:

- Promulgate noise emission standards for interstate commerce (i.e., vehicle noise standards).
- Assist state and local transportation system noise abatement efforts.
- Promote noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumes a significant role in noise control through its various operating agencies.

The Federal Aviation Administration (FAA) regulates noise from aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA) (formerly the Urban Mass Transit Administration). Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the Federal government actively advocates that local jurisdictions use their land use authority to arrange developments projects such that "noise sensitive" land uses are either prohibited from being sited adjacent to a highway or, alternately, that development projects are planned and constructed such that potential noise impacts are minimized.

Since the Federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the State and local governments may regulate transportation system noise by adopting nuisance abatement ordinances and through the land use planning process.

3.13.3.2 State

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regulatory tools that control and abate noise when implemented by local agencies. One significant tool is the "Land Use Compatibility for Community Noise Environments Matrix," which enables local agencies to more clearly delineate compatibility of sensitive uses with various levels of ambient noise.

Article 4 of the California Administrative Code (California Noise Insulation Standards, Title 24, Chapter 1) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) intended to prevent interior Day-Night (L_{dn}) and/or CNEL noise levels from exceeding

45 dBA. When such structures are located within a 60-dBA L_{dn} or CNEL noise contour, an acoustical analysis is required to ensure that interior levels will not exceed the 45-dBA limit.

State Government Code §65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The noise element must recognize the Land Use Compatibility Guidelines published by the State Department of Health Services, which rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

3.13.3.3 Local

In California, cities and counties are required to adopt a noise element as part of their general plan. Cities and counties can also adopt noise control requirements through their zoning ordinances or as a separate noise ordinance. The Project site is located within the County of Tulare; therefore, the County noise standards are utilized to determine the significance of Project noise impacts.

Tulare County does not have any specific development codes or zoning ordinances related to noise or vibration; therefore, the County General Plan criteria, as discussed in the following sections, represent the only applicable noise thresholds by which Project impacts can be compared.

Tulare County General Noise Policies & Guidelines

The *Tulare County General Plan – 2030 Update*, Noise Element (Section 10.8) has a number of policies related to noise (Tulare County, 2012). General Plan noise policies that apply to the Project are listed below. Please note, the General Plan defines "noise sensitive land use(s)/receptors" to include "residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses" (Tulare County General Plan, Section 10 – Health and Safety).

HS-8.1 **Economic Base Protection** – The County shall protect its economic base by preventing the encroachment of incompatible land uses on known noise-producing industries, railroads, airports, and other sources.

HS-8.2 **Noise Impact Areas** – The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB Ldn (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.

HS-8.3 **Noise Sensitive Land Uses** – The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB Ldn (or CNEL) or less within outdoor activity areas and 45 dB Ldn (or CNEL) or less within interior living spaces.

HS-8.4 **Airport Noise Contours** – The County shall ensure new noise sensitive land uses are located outside the 60 CNEL contour of all public use airports.

HS-8.6 **Noise Level Criteria** – The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).

Table 10.1: Land Use Compatibility for Community Noise Environments *(see Figure 3.13-3)*, is provided as a reference concerning the sensitivity of different land uses to their noise environment. It is intended to illustrate the range of noise levels which will allow the full range of activities normally associated with a given land use.

HS-8.7 **Inside Noise** – The County shall ensure that in instances where the windows and doors must remain closed to achieve the required inside acoustical isolation, mechanical ventilation or air conditioning is provided.

HS-8.8 **Adjacent Uses** – The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB Ldn (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.

HS-8.10 **Automobile Noise Enforcement** – The County shall encourage the CHP, Sheriff's office, and local police departments to actively enforce existing sections of the California Vehicle Code relating to adequate vehicle mufflers, modified exhaust systems, and other amplified noise.

HS-8.11 **Peak Noise Generators** – The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

HS-8.13 **Noise Analysis** – The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 *(see Figure 3.13-3)* of the Health and Safety Element).

HS-8.14 **Sound Attenuation Features** – The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.

HS-8.18 **Construction Noise** – The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7 pm, Monday through Saturday when construction activities are located near sensitive receptors.

No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 **Construction Noise Control** – The County shall ensure that construction contractors implement best practices guidelines (i.e., berms, screens, etc.) as appropriate and feasible to reduce construction-related noise impacts on surrounding land uses.

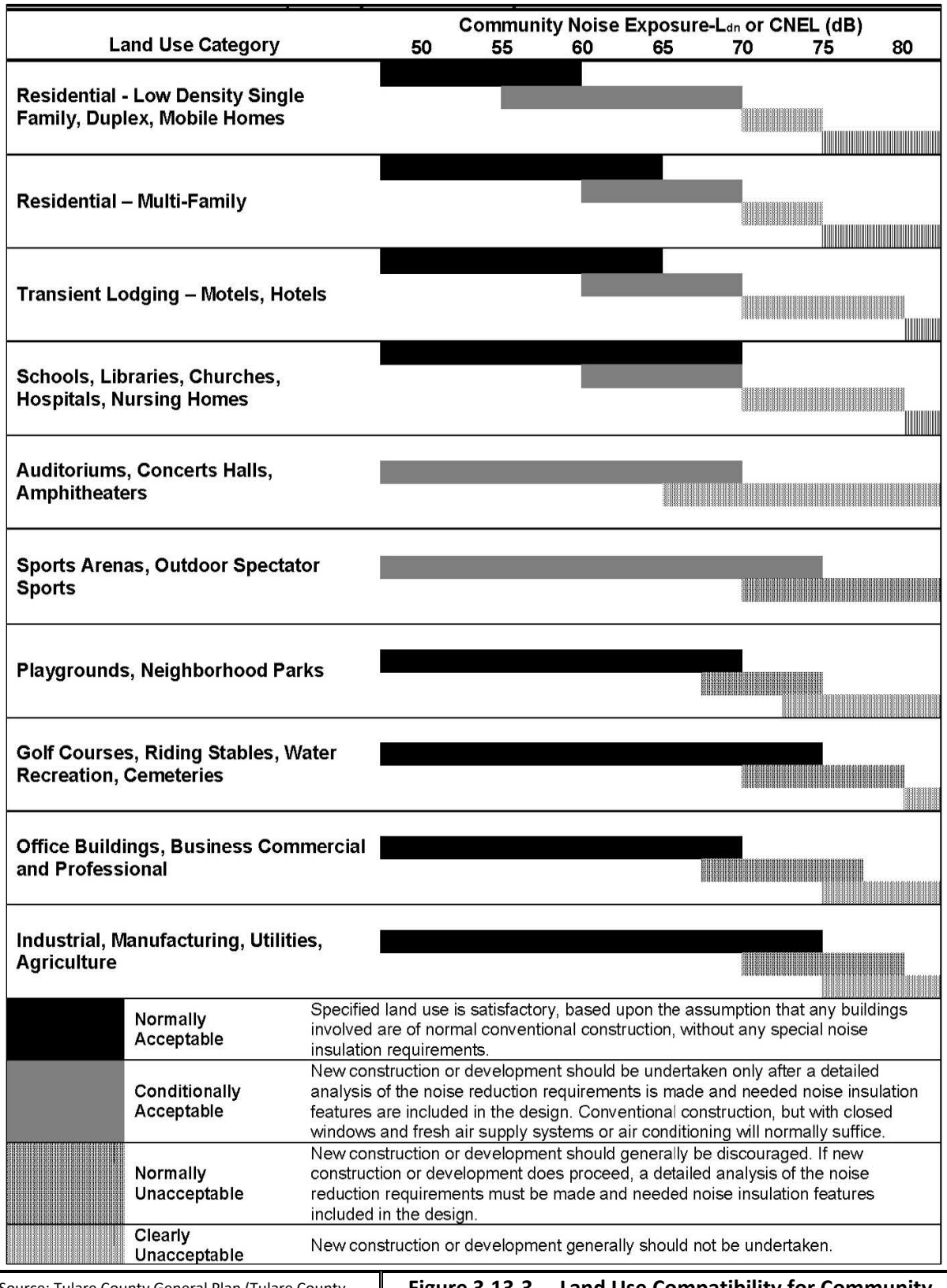
Vibration Criteria

Tulare County does not have any specific ordinances, policies, criteria or restriction related to groundborne vibration. However, the California Department of Transportation (Caltrans) has developed a set of criteria to assess the potential impacts caused by vibration-generating activities. Table 3.13-5 outlines threshold criteria for Project-related vibration impacts on nearby human populations, based on test subjects' responses to transient vibrations in terms of peak particle velocity (PPV) in units of inches per second (in/sec). These criteria form the basis of the groundborne vibration impact analysis in Section 3.13.6.8.

Table 3.13-5. Human Responses to Transient Vibration

PPV (inches/second)	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

Source: *Transportation and Construction Induced Vibration Guidance Manual* (Caltrans, 2020).



Source: Tulare County General Plan (Tulare County, 2012)

Figure 3.13-3 Land Use Compatibility for Community Noise Environments

3.13.4 Significance Thresholds

3.13.4.1 Appendix G Thresholds of Significance

According to Appendix G of the State CEQA Guidelines (CCR, Title 14, Division 6, Chapter 3, § 15000 – 15387), the Project would have a significant effect on public health and safety if there is:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Generation of excessive groundborne vibration or groundborne noise levels.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

3.13.4.2 Additional Thresholds of Significance

Tulare County Noise Regulations

As described in Sections 3.13.3.3, Tulare County has adopted various guidelines, requirements and policies related to noise in their General Plan. Tulare County does not have any specific development codes or zoning ordinances related to noise, therefore the County General Plan criteria represent the only applicable noise thresholds by which Project impacts can be compared. The Tulare County noise thresholds are utilized to address CEQA Checklist item *a)*.

Table 3.13-6 presents the applicable unadjusted Project noise thresholds, which are derived from the Tulare County regulatory standards presented in Section 3.13.3.3 above.

Table 3.13-6. Unadjusted Tulare County Noise Standards

Parameter/Description	Day-Night (L_{dn}) or CNEL Average Noise Limit
Policy HS-8.8: Noise level not to be exceeded at the boundary of areas designated and zoned for residential or other noise-sensitive uses as a result of the Project activities.	60 dB(A)

Source: (Tulare County, 2012)

Although not specified within the Tulare County General Plan, generally in cases where the existing ambient noise levels exceed the applicable standards, then the noise level standard would be increased at +3 dBA increments to encompass the ambient noise. This concept corresponds with the concept that a +3 dBA increase or decrease is generally accepted as the minimum perceptible change in noise. Additionally, if ambient noise levels are within ±1 dBA of the applicable significance threshold, the applicable County noise level standards are increased by +3 dBA increments to encompass the ambient (e.g., ambient level of 59.3 dB results in a significance threshold of 62.3 dB rather than 60 dB). Table 3.13-7 below presents the applicable Tulare County significance thresholds for each receptor, adjusted as needed to encompass the ambient noise levels presented in Table 3.13-4. Additional detail regarding

these calculations is included in Appendix H.

Table 3.13-7 below presents the applicable Tulare County significance thresholds for each receptor. These noise thresholds are utilized to address CEQA Checklist item *a)* in Section 3.13.6.7 below.

Table 3.13-7. Applicable Tulare County Noise Standards

Receptor	Measured Ambient Noise Level (L_{dn})	Tulare County General Plan Threshold	Adjusted Threshold to Account for Ambient
R1	47.6	60	---
R2	51.7	60	---
R3	59.3	60	62.3
R4	44.7	60	---
R5	57.4	60	60.4
R6	57.4	60	60.4
R7	52.5	60	---
R8	56.0	60	---
R9	51.8	60	---
R10	47.8	60	---

Note: Appendix H.

Vibration Significance Thresholds

As discussed in Section 3.13.3.3, Tulare County does not have any specific standards or criteria related to vibration. Therefore, the Caltrans vibration criteria presented in Section 3.13.3.3 is utilized to determine the significance of Project vibration impacts. Specifically, the peak particle velocity (PPV) of 0.24 inches per second (in/sec) presented in Table 3.13-9, which is considered a "distinctly perceptible" vibration level, is utilized to determine the significance of Project vibration impacts per CEQA Checklist item *b)*.

3.13.5 Methodology of Analysis

To quantify the noise generated by the Project noise sources (i.e., excavation, construction and reservoir maintenance equipment/structures) reference data was gathered from the Federal Highway Administration's (FHWA) *Roadway Construction Noise Model User Guide* (Federal Highway Administration, 2006) and other relevant sources. The following sections summarize the methodologies, assumptions and reference noise levels utilized in the analyses of each Project phase: 1) Reservoir Excavation; 2) Reservoir Construction; and, 3) Reservoir Operations. Also see Appendix H for more detail.

3.13.5.3 Reservoir Excavation

To determine the appropriate sound pressure levels generated during reservoir excavation activities, various noise reference data was utilized. Per information provided by TID and West Coast Sand and Gravel (WCSG), mobile equipment (e.g., loaders, excavators, haul trucks, etc.) would operate onsite during the reservoir excavation phase to mine and transport material. Mobile equipment source noise average (L_{eq}) and maximum (L_{max}) sound pressure levels were determined using FHWA reference data. Appendix H summarizes the FHWA source noise data utilized to quantify mobile equipment noise levels during reservoir excavation.

In addition to mobile equipment, an aggregate screen/wash plant and, as needed, a mobile crush/recycle plant (referred to as the processing plants) would also operate onsite during reservoir excavation. Noise levels associated with these plants are based on field measurements collected by Sespe Consulting, Inc. in 2020 from a comparable processing and recycling operation in Otay Mesa, California. In addition to these plants, other ancillary equipment, specifically haul trucks and loaders, were operating nearby simultaneously when these measurements were collected. Therefore, the measured noise levels represent a conservative overestimation of the noise generated by the Project's aggregate screen/wash plant and crush/recycle plant. Appendix H contains additional detail and relevant references for the processing plant noise sources.

Table 3.13-8 shows the type and quantity of equipment that would be utilized onsite during the reservoir excavation phase. Usage fraction (%) and maximum sound pressure level (L_{max}) noise data shown for mobile sources are FHWA default values. Source noise calculations in Appendix H provide additional detail.

Table 3.13-8. Reservoir Excavation – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders (x4)	80	40%	76
Excavator	85	40%	81
Haul Trucks (x2)	84	40%	80
Water Truck	84	40%	80
Processing Plants Sources			
Screen/Wash Plant	---	---	84.1
Crush/Recycle Plant	---	---	84.1

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006) and Otay Mesa Noise Study (Sespe Consulting, 2020). See Appendix H for more detail.

Per information provided by WCSG, reservoir excavation activities would be limited to Monday through Saturday, between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier). Because the County criteria applies to noise impacts over a 24-hour period (i.e., Day-Night [L_{dn}] noise levels), it was assumed that the onsite equipment summarized in Table 3.13-8 would operate simultaneously for up to 14-hours in a given day. Additionally, it was conservatively assumed that the equipment would operate at-grade in the onsite locations in closest proximity to each receptor (see Figure 3.13-2).

Noise Attenuation due to Excavation Pit Walls

To determined worst-case noise impacts during the reservoir excavation phase, it is assumed that the excavation and processing equipment summarized in Table 3.13-8 would operate simultaneously at-grade in the onsite location closest to each affected receptor (see Figure 3.13-2). Therefore, shielding and noise attenuation due to distance and intervening topography was conservatively not accounted for in the impact calculations. In reality, as the excavation progresses, the processing plants would operate within

the pit. Being located at the bottom of the pit would eventually block line-of-sight between equipment and nearby receptors.

As the excavation pit deepens, significant noise attenuation will be provided by the pit walls as they would sufficiently break line-of-sight between Project excavation noise sources (i.e., mobile equipment and processing plants) and nearby residential receptors. Barrier insertion loss calculations presented in Appendix H show that once reservoir excavation operations reach a depth of 16-feet bgs, assuming equipment is operating within the bottom of the pit, noise levels experienced at nearby receptors would be significantly attenuated (estimated to be a minimum -14.0 dBA reduction at Receptor 1 [R1]). Please see the discussion in Section 3.13.6 below and the calculations in Appendix H for additional detail.

3.13.5.4 Reservoir Construction

Once the pit is fully excavated and the basin/slopes stabilized, construction of the reservoir would commence. Specifically, this Project phase would involve construction of the inflow/outflow channels and chutes, installation of the electrically operated weirs and energy dissipation pools, and installation of other ancillary structures (e.g., perimeter berm/access road, aboveground storage tank [AST] tank and related generator/housing structure, etc.).

Per information provided by TID, Table 3.13-9 summarizes mobile equipment that would operate onsite during this Project phase. As with excavation, construction of the reservoir is estimated to occur between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier). Although much of the reservoir construction activities are expected occur below-grade within the excavation pit, conservatively it is assumed that the equipment presented in Table 3.13-9 would operate simultaneously, at-grade in the onsite locations in closest proximity to each receptor (see Figure 3.13-2). See Appendix H for the source noise calculations.

Table 3.13-9. Reservoir Construction – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders	80	40%	76
Excavator	85	40%	81
Backhoe	80	40%	76
Grader	85	40%	81
Trencher	80	40%	76
Compactor	80	20%	73
Crane	85	16%	77
Cement Truck	85	40%	81
Water Truck	84	40%	80
Generator	82	50%	79
Pumps	77	50%	74

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006). See Appendix H for more detail.

3.13.5.5 Reservoir Operations

Once the reservoir is constructed, the Owners would manage the operations remotely from TID's offsite administration office in Tulare, California. As needed, TID staff would perform onsite inspections to ensure the reservoir. During the operations and maintenance of the reservoir, there would be limited equipment usage. For example, equipment may be needed to perform minor grading of the access. TID estimates that onsite reservoir maintenance using mobile equipment would occur only a few times per year (approximately 1 to 2 days per year).

Mobile equipment summarized in Table 3.13-10 would be used onsite annually for intermittent reservoir maintenance operations. Reservoir operations and maintenance activities would be conducted by TID staff during normal working hours, specifically between the hours of 8:00 a.m. and 5:00 p.m.

Table 3.13-10. Reservoir Operations/Maintenance – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders	80	40%	76
Grader	85	40%	81
Dump Truck	84	40%	80
Generator	82	50%	79

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006). See Appendix H for more detail.

3.13.5.6 Project Design Features and Environmental Protection Measures

Numerous design features, best management practices (BMPs), operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental protective measures that were considered during this evaluation include, but are not limited to, the following:

1. Blasting would not be used for the excavation operations.
2. No excavation of material would take place within thirty (30) to fifty (50) feet from adjacent property lines (see Figure 2-5 in Section 2.0 – Project Description).
3. The processing of aggregate at the Project site has been designed not to exceed the production rates historically achieved at the Seaborn site.

Due to design feature Number 3, the number of haul trucks and employee vehicles on public roadways would not increase above existing levels as a result of the Project. Therefore, noise impacts resulting transportation sources are not analyzed in this DEIR.

3.13.6 Project-Level Impacts and Mitigation Measures

3.13.6.7 Generation of Ambient Noise Levels in Excess of Applicable Standards

Impact Statement

Impact NO-1: *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?* **(Appendix G Threshold Criteria (a))**

Impact Analysis

To address the CEQA Criteria *a)*, the applicable Tulare County General Plan criteria presented in Section 3.13.4.2 (also see Table 3.13-6 and Table 3.13-7) is utilized. The following sections summarize the Project noise impacts determined for each individual Project phase: 1) Reservoir Excavation; 2) Reservoir Construction; and, 3) Reservoir Operations. The predicted change in noise level experience at each receptor due to Project operations is quantified and compared to the applicable Tulare County thresholds to determine the significance of Project impacts. Where Project noise levels exceed applicable thresholds, feasible mitigation measures are proposed. The detailed methodology is provided in Section 3.13.5 and the calculations in Appendix H.

Reservoir Excavation

Table 3.13-11 below shows the predicted change in Day-Night (L_{dn}) noise level estimated at each receptor as a result of reservoir excavation operations. As discussed in Section 3.13.5.3, it is assumed that the excavation and processing equipment summarized in Table 3.13-8 would operate simultaneously at-grade in the onsite location closest to each affected receptor (see Figure 3.13-2) to determined worst-case noise impacts during this initial Project phase.

As shown in Table 3.13-11 below, worst-case, unmitigated noise levels during reservoir excavation exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptors R1, R5, and R6. The calculations in Appendix H provide additional detail. It is also important to note that these exceedances associated with the reservoir excavation operations are expected to be short-term and temporary in nature. Over time, as the excavation pit proceeds to a final depth of approximately 60-feet bgs, equipment noise would be increasingly shielded due to the attenuation provided by the deepening pit walls. Appendix H contains the calculations and details (e.g., receptor/equipment heights, noise transmission paths, etc.) used to estimate noise attenuation provided by the excavation pit walls.

Table 3.13-11. Reservoir Excavation – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	73.4	60	**Yes**	+13.4
R2	4,978	55.3	60	No	---
R3	3,980	60.6	62.3	No	---
R4	4,190	54.7	60	No	---
R5	2,560	61.0	60.4	**Yes**	+0.6
R6	2,539	61.1	60.4	**Yes**	+0.7

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R7	2,382	60.0	60	No	---
R8	3,262	59.3	60	No	---
R9	4,251	56.1	60	No	---
R10	3,891	55.7	60	No	---

Note: Values shown in **bold** represent a potentially significant impact. See Appendix H for more detail.

Referring to Table 3.13-11, noise levels during the Project excavation phase do not exceed the applicable County noise standards except at Receptors 1 (R1), 5 (R5) and 6 (R6). Please see the mitigation measures presented below.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

As shown in Table 3.13-11, at the initial stages of the excavation phase when mobile and processing equipment would be operating at-grade, noise impacts at Receptors R1, R5 and R6 exceed various County L_{dn} noise standards. As discussed in Section 3.13.5.3, at an approximate depth of 16-feet bgs, an estimated -16.3 dBA of noise attenuation would result at Receptor 1 (R1). Similar reductions would also be expected at the receptors. Therefore, once reservoir excavation reaches this depth (i.e., 16-feet bgs or lower), and the processing plants are relocated into the pit, Project noise levels would be less than the applicable Tulare County criteria at every receptor, and no additional mitigation measures would be required.

Nevertheless, to ensure noise levels do not exceed these applicable threshold criteria during Project's reservoir excavation operations occurring at 16-feet bgs or higher, control measures sufficient to obtain noise reductions ranging from -13.4 dBA's (i.e., L_{dn} at R1) to -0.6/-0.7 dBA's (L_{dn} at R5 and R6) would need to be implemented. The following discusses potential control measures:

- Because the Tulare County Day-Night (L_{dn}) noise criteria averages noise impacts over an adjusted 24-hour period, Project noise levels can also be controlled by limiting daily operational hours. This is especially true when prohibiting operations between the hours of 10:00 p.m. and 7:00 a.m., as the L_{dn} threshold adds a +10 dBA penalty to Project noise levels generating during those hours.
- As discussed above, the residence located at Receptor 1 (R1) is owned by TID and leased out periodically to tenants. Therefore, TID has the ability to control the occupancy of R1, set the terms of lease agreements, and inform the current occupants of any temporary noise impacts resulting from the Project.

Until the reservoir excavation operations reach a depth of 16-feet bgs and the processing plants are relocated, mitigation measures are required to ensure Project noise levels comply with the applicable Tulare County criteria. As discussed above, one such method would be restricting the operational hours when noise generating activities are occurring. Specifically, if at-grade onsite processing (i.e., screen/wash plant and crush/recycle plant) operations were prohibited between the hours of 4:00 a.m. and 7:00 a.m.,

noise impacts at affected receptors would be reduced. Table 3.13-12 presents the predicted Day-Night (L_{dn}) noise level experienced at each receptor, assuming processing operations were prohibited between the hours of 4:00 a.m. and 7:00 a.m. As discussed above, once excavation reaches a minimum depth of 16-feet bgs and the processing plants are relocated, the processing operations would not be restricted during these hours.

Mitigation Measure NO-1: *Onsite material processing operations occurring at or above a depth of 16-feet below ground surface shall be prohibited between the hours of 4:00 a.m. and 7:00 a.m.*

Table 3.13-12. Reservoir Excavation – Limited Processing Hours of Operation

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?
R1	465	**71.6**	**60**	**Yes**
R2	4,978	54.4	60	No
R3	3,980	60.2	62.3	No
R4	4,190	53.1	60	No
R5	2,560	60.1	60.4	No
R6	2,539	60.1	60.4	No
R7	2,382	58.6	60	No
R8	3,262	58.4	60	No
R9	4,251	55.1	60	No
R10	3,891	54.2	60	No

Note: Values shown in **bold** represent a potentially significant impact. See Appendix H for more detail.

As shown in Table 3.13-12, even with at-grade onsite processing operations prohibited between the hours of 4:00 a.m. and 7:00 a.m., estimated noise levels experienced at Receptor 1 (R1) still exceed the applicable County L_{dn} threshold by +11.6 dBA's. Therefore, in addition to the provisions outlined above, the following mitigation specific to Receptor 1 (R1) is required. As discussed previously, TID owns and leases the residential receptor located at R1. As with Mitigation Measure NO-1, this additional measure is only necessary if excavation/noise-generating operations are occurring at a depth of 16-feet bgs or higher.

Mitigation Measure NO-2: *In order to reduce the noise level at Receptor 1 (R1) to less than the significant, TID must utilize one of the following measures. This mitigation measure is not required once the processing plants or other sources of noise that could result in an exceedance of the noise threshold criteria are relocated to a minimum depth of 16-feet below ground surface:*

- *Vacate the residence located at Receptor R1 when noise exceedances would occur; or*
- *Inform the occupant of Receptor R1 that temporary elevated noise levels may result during certain periods of the Project, and obtain a signed waiver from the tenant indicating that they choose to remain in the house despite the temporary increase in noise levels. The waiver should describe the potential level of exceedance, times periods and approximate length of time that the exceedances could occur.*

Through the implementation of Mitigation Measures NO-1 or NO-2, or a combination thereof, reservoir excavation noise sources are expected to have a less than significant impact at nearby receptors with mitigation incorporated.

It is also important to note this analysis was designed to estimate conservative worst-case Project noise impacts at nearby receptors. In reality, when taking into account the shielding or absorption effects from intervening topography/vegetation, and the fact that most operations would not always occur simultaneously near the outermost Project site boundary or within direct line-of-sight of affected receptors (as was assumed in this analysis), noise levels are expected to be less than those calculated within this DEIR. Furthermore, as excavation progresses to a final depth of 60-feet bgs and the pit walls deepen, additional noise attenuation can be assumed.

Level of Significance After Mitigation

Less than significant.

Reservoir Construction

Impact Analysis

Table 3.13-13 below shows the predicted change in Day-Night (L_{dn}) noise level at each receptor during reservoir construction. As with the reservoir excavation analysis, it is conservatively assumed that the reservoir construction equipment summarized in Table 3.13-9 would operate simultaneously, at-grade in the onsite location closest to each affected receptor (see Figure 3.13-2). Additionally, onsite materials processing, specifically the screen/wash plant and crush/recycle plant, would no longer be required during the reservoir construction phase. As shown in Table 3.13-13, worst-case, unmitigated noise levels during onsite reservoir construction activities exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptor R1. Because this residence is owned by TID, as discussed above, implementation of Mitigation Measure NO-2 is sufficient to reduce the potential impact to less than significant.

Table 3.13-13. Reservoir Construction – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	71.9	60	**Yes**	+11.9
R2	4,978	54.5	60	No	---
R3	3,980	60.3	62.3	No	---
R4	4,190	53.4	60	No	---
R5	2,560	60.2	60.4	No	---
R6	2,539	60.3	60.4	No	---
R7	2,382	58.8	60	No	---
R8	3,262	58.5	60	No	---
R9	4,251	55.2	60	No	---
R10	3,891	54.4	60	No	---

Note: Values shown in **bold** represent a potentially significant impact. See Appendix H for more detail.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Upon implementation of Mitigation Measure NO-2 described above, Project impacts to nearby receptors would be less than significant.

Level of Significance After Mitigation

Less than significant.

Reservoir Operations

Impact Analysis

Table 3.13-14 below shows the predicted change in Day-Night (L_{dn}) noise level at each receptor during ongoing reservoir operations/routine maintenance. To determined worst-case noise impacts during this Project phase, it is assumed that maintenance equipment listed in Table 3.13-10 would operate at-grade in the onsite location closest to each affected receptor. Although onsite reservoir operations/maintenance activities would be very infrequent (approximately 1 to 2 times per year) and would generally not require the use of mobile equipment, conservatively this analysis assumed that all maintenance equipment listed in Table 3.13-10 would operate simultaneously for one full day (i.e., 8:00 a.m. to 5:00 p.m.).

As shown in Table 3.13-14, worst-case, unmitigated noise levels during reservoir operations/maintenance exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptor R1. As discussed above, Receptor R1 is owned by TID; therefore, implementation of Mitigation Measure NO-2 would be sufficient to reduce the potential impact to less than significant.

Table 3.13-14. Reservoir Operations – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	61.9	60	**Yes**	+1.9
R2	4,978	52.1	60	No	---
R3	3,980	59.4	62.3	No	---
R4	4,190	46.8	60	No	---
R5	2,560	57.8	60.4	No	---
R6	2,539	57.8	60.4	No	---
R7	2,382	53.7	60	No	---
R8	3,262	56.3	60	No	---
R9	4,251	52.3	60	No	---
R10	3,891	49.1	60	No	---

Note: Values shown in **bold** represent a potentially significant impact.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

Upon implementation of Mitigation Measure NO-2 described above, Project impacts to nearby receptors would be less than significant.

Level of Significance After Mitigation

Less than significant.

3.13.6.8 Generation of Excessive Groundborne Vibration

Impact Statement

Impact NO-2: *Generation of excessive groundborne vibration or groundborne noise levels?* **(Appendix G Threshold Criteria (b))**

Impact Analysis

The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (Federal Transit Administration, 2006) and Caltrans's *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020) documents provide guidelines for assessing vibration impacts resulting from construction activities. Table 3.13-15 below lists vibration source levels for common types of construction equipment, in terms of peak particle velocity (PPV) in units of inches per second at a distance of 25-feet.

Table 3.13-15. Vibration Source Level for Construction Equipment

Equipment	PPV (in/sec) @ 25-feet away
Vibratory Roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Vibratory Roller	0.210

Source: *Transportation and Construction Induced Vibration Guidance Manual* (Caltrans, 2020). *Transit Noise and Vibration Impact Assessment* (Federal Transit Administration, 2006).

To assess Project vibration impacts at each receptor location, the reference PPV value of 0.089 inches per second (i.e., large bulldozer) is utilized. It is assumed that nothing larger or more powerful than a large bulldozer would be utilized at the Project site in close proximity to nearby receptors. The distance shown represents the measured distance from the closest boundary of the active mining area to the nearest property line of the receptor. Using this information, Table 3.13-16 summarizes the predicted groundborne vibration impacts resulting from the Project. Significance was determined by comparing the

predicted change in groundborne vibration to the applicable County Code vibration threshold described in Section 3.13.4.1.

Table 3.13-16. Predicted Project Vibration Levels at Receptors

Receptors	Distance (feet)	Predicted Vibration – PPV (in/sec) [A]	Applicable San Bernardino County Significance Threshold – PPV (in/sec	Significant?
R1	465	0.0036	≤ 0.2	No
R2	4,978	0.0003	≤ 0.2	No
R3	3,980	0.0003	≤ 0.2	No
R4	4,190	0.0003	≤ 0.2	No
R5	2,560	0.0005	≤ 0.2	No
R6	2,539	0.0006	≤ 0.2	No
R7	2,382	0.0006	≤ 0.2	No
R8	3,262	0.0004	≤ 0.2	No
R9	4,251	0.0003	≤ 0.2	No
R10	3,891	0.0003	≤ 0.2	No

Note: See Appendix H for more detail.

A – The Project vibration levels shown above are considered "barely perceptible" per Caltrans guidance (Caltrans, 2020).

As shown in Table 3.13-16, predicted vibration impacts to nearby receptors were well below the applicable San Bernardino County vibration significance threshold. It should also be noted that predicted vibration impacts at nearby receptors are considered "barely perceptible" per Caltrans criteria (see Table 3.13-5) for human response (i.e., ≤ 0.035 PPV in/sec). Therefore, groundborne vibration impacts to nearby receptors resulting from Project operations are less than significant with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not Applicable.

3.13.6.9 Airport Land Use/Vicinity Analysis

Impact Statement

Impact NO-3: *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?* **(Appendix G Threshold Criteria (c))**

Impact Analysis

The proposed Project site is not located within 2.0 miles of any private or public airports or airstrips, or in an area governed by an airport land use plan. The closest airport/airstrip is Woodlake Airport, located approximately 2.4 miles west of the Project site. Please see Figure 3.13-1 which displays the location of this airport in relation to the Project site. Furthermore, the Project does not involve creation of a new noise-sensitive land uses (i.e., residences). Therefore, the Project would have no impact related to airport/airstrip noise levels.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not Applicable.

3.13.7 Cumulative-Level Impacts and Mitigation Measures

Table 3-1 identifies the other projects that the County and the City of Woodlake considered in regards to potential cumulative impacts. As noted in Table 3-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with noise and vibration impacts.

Generally, the context for cumulative impacts for noise and vibration impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the impact analysis (Section 3.13.6) above for each impact threshold, the Project was determined to have either no impact, a less than significant impact, or significant but mitigated to less than significant. Since the Project would present no significant impacts related to noise or vibration, there would be no cumulative impact in conjunction with the other cumulative projects.

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3.14 POPULATION AND HOUSING

3.14.1 Introduction

This section of the DEIR presents a discussion of population and housing resources. A review of potential Project impacts is provided in the following analysis.

3.14.2 Environmental Setting

3.14.2.1 Regional and Local Setting

Tulare County is located in a geographically diverse encompassing approximately 4,840 square miles of classified lands (lands with identified uses) and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and, a mountain region just east of the foothills. The eastern half of the County is generally comprised of public lands, including the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. Federal lands, which include wilderness, national forests, monuments and parks, along with County parks, make up 52% of the County. Agricultural uses, which include row crops, orchards, dairies, and grazing lands on the Valley floor and in the foothills total over 2,020 square miles or about 43% of the entire County. Urban uses such as incorporated cities, communities, hamlets, other unincorporated urban uses, and infrastructure rights-of-way make up the remaining land in the County.

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 mile to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map in Section 2.0 – Project Description). The figures in Section 2.0 – Project Description illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural and, to a limited extent, for rural residential purposes.

Because of the existence of high-quality aggregate in the alluvial soils in the area of the Project site there are also aggregate mining operations and processing facilities adjacent to the Project and throughout the immediate area.

3.14.3 Regulatory Setting

3.14.3.1 Federal

U.S. Department of Housing and Urban Development (HUD)

HUD's mission is to create strong, sustainable, inclusive communities and quality affordable homes for all. HUD works to strengthen the housing market to bolster the economy and protect consumers; meet the need for quality affordable rental homes: utilize housing as a platform for improving quality of life; build inclusive and sustainable communities free from discrimination; and transform the way HUD does business.

3.14.3.2 State

California Department of Housing and Community Development (HCD)

HCD's mission is to provide leadership, policies and programs to preserve and expand safe and affordable housing opportunities and promote strong communities for all Californians. In 1977, the State Department of Housing and Community Development (HCD) adopted regulations under the California Administrative Code, known as the Housing Element Guidelines, which are to be followed by local governments in the preparation of local housing elements. Assembly Bill (AB) 2853, enacted in 1980, further codified housing element requirements. Since that time, new amendments to State Housing Law have been enacted. Each of these amendments has been considered during development of this Housing Element.

California Relocation Assistance Act

The State of California adopted the California Relocation Assistance Act (California Government Code §7260 et seq.) in 1970. This State law, which follows the federal Uniform Relocation Assistance and Real Property Acquisition Act, requires public agencies to provide procedural protections and benefits when they displace businesses, homeowners, and tenants in the process of implementing public programs and Projects. This State law calls for fair, uniform, and equitable treatment of all affected persons through the provision of relocation benefits and assistance to minimize the hardship of displacement on the affected persons.

3.14.3.3 Local

Tulare County 2014 Regional Housing Needs Assessment Plan

Housing element law requires all local governments to adequately plan to meet their existing and projected housing needs including their share of the regional housing need. In Tulare County, the regional housing need is determined by the Tulare County Association of Governments (TCAG) through the Regional Housing Needs Assessment (RHNA) process. The RHNA planning period for this element is January 1, 2014 – September 30, 2023. The RHNA process specifies the number of housing units that must be accommodated in four income categories: very low, low, moderate and above moderate. RHNA is not a production quota; however, demonstration of adequate capacity for new dwelling units on vacant or underutilized sites is the basis for compliance with the RHNA component of housing element law.

Tulare County Regional Blueprint 2009

This Blueprint includes the following preferred growth scenario principals:

- Increase densities county-wide by 25% over the status quo densities;
- Establish light rail between cities;
- Extend Highway 65 north to Fresno County;
- Expand transit throughout the county;
- Maintain urban separators around cities; and
- Growth will be directed toward incorporated cities and communities where urban development exists and where comprehensive services and infrastructure are or will be provided.

Tulare County Housing Authority

The Housing Authority of the County of Tulare (HATC) has been officially designated as the local public housing agency for the County of Tulare by the Board of Supervisors and was created pursuant to federal and state laws. HATC is a unique hybrid: a public sector agency with private sector business practices. Their major source of income is the rents from residents. The HATC mission is "to provide affordable, well-maintained rental housing to qualified low and very low-income families. Priority shall be given to working families, seniors and the disabled. Tenant self-sufficiency and responsibility shall be encouraged. Programs shall be self-supporting to the maximum extent feasible." HATC provides rental assistance to very low and moderate-income families, seniors and the handicapped throughout the county. HATC offers many different programs, including the conventional public housing program, the housing choice voucher program (Section 8), the farm labor program for families with farm labor income, senior housing programs, and other programs. They also own or manage some individual subsidized rental complexes that do not fall under the previous categories, and can provide information about other affordable housing that is available in Tulare County. All programs are handicap accessible. Almost all of the complexes have 55-year recorded affordability covenants.

Tulare County General Plan

The Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)", with a General Plan designation of "Valley Agriculture". The Tulare County General Plan has a number of policies related to housing that apply to projects within County of Tulare. General Plan policies that relate to housing and population are listed as follows:

- ***Housing Guiding Principle 1.1:*** *Endeavor to improve opportunities for affordable housing in a wide range of housing types in the communities throughout the unincorporated area of the County.*
- ***Housing Policy 1.11:*** *Encourage the development of a broad range of housing types to provide an opportunity of choice in the local housing market.*
- ***Housing Policy 1.13:*** *Encourage the utilization of modular units, prefabricated units, and manufactured homes.*
- ***Housing Policy 1.14:*** *Pursue an equitable distribution of future regional housing needs allocations, thereby providing a greater likelihood of assuring a balance between housing development and the location of employment opportunities.*
- ***Housing Policy 1.15:*** *Encourage housing counseling programs for low income homebuyers and homeowners.*
- ***Housing Policy 1.16:*** *Review community plans and zoning to ensure they provide for adequate affordable residential development.*
- ***Housing Guiding Principle 1.2:*** *Promote equal housing opportunities for all persons regardless of race, religion, sex, marital status, ancestry, national origin, color, family status, disability, or any other arbitrary basis.*

- ***Housing Guiding Principle 1.3:*** *Strive to meet the housing needs of migrant and non-migrant farmworkers and their families with a suitable, affordable and satisfactory living environment.*
- ***Housing Policy 1.31:*** *Encourage the provision of farmworker housing opportunities in conformance with the Employee Housing Act.*
- ***Housing Policy 1.33:*** *Encourage and support a balance between housing and agricultural needs.*
- ***Housing Policy 1.51:*** *Encourage the construction of new housing units for "special needs" groups, including senior citizens, large families, single heads of households, households of persons with physical and/or mental disabilities, minorities, farmworkers, and the homeless in close proximity to transit, services, and jobs.*
- ***Housing Policy 1.52:*** *Support and encourage the development and improvement of senior citizen group housing, convalescent homes and other continuous care facilities.*
- ***Housing Policy 1.55:*** *Encourage development of rental housing for large families, as well as providing for other housing needs and types.*
- ***Housing Guiding Principle 1.6:*** *Assess and amend County ordinances, standards, practices and procedures considered necessary to carry out the County's essential housing goal of the attainment of a suitable, affordable and satisfactory living environment for every present and future resident in unincorporated areas.*
- ***Housing Policy 2.14:*** *Create and maintain a matrix of Infrastructure Development Priorities for Disadvantaged Unincorporated Communities in Tulare County thorough analysis and investigation of public infrastructure needs and deficits, pursuant to Action Program 9.*
- ***Housing Guiding Principle 2.2:*** *Require proposed new housing developments located within the development boundaries of unincorporated communities to have the necessary infrastructure and capacity to support the development.*
- ***Housing Policy 2.21:*** *Require all proposed housing within the development boundaries of unincorporated communities is either (1) served by community water and sewer, or (2) that physical conditions permit safe treatment of liquid waste by septic tank systems and the use of private wells.*
- ***Housing Guiding Principle 3.1:*** *Encourage "smart growth" designed development that serves the unincorporated communities, the environment, and the economy of Tulare County.*
- ***Housing Policy 3.11:*** *Support and coordinate with local economic development programs to encourage a "jobs to housing balance" throughout the unincorporated area.*
- ***Housing Policy 3.12:*** *Support locally initiated programs to provide neighborhood parks and recreational facilities for residential areas within unincorporated communities.*
- ***Housing Policy 3.13:*** *Encourage subdivision and housing unit design, which provides for a reasonable level of safety and security.*

- ***Housing Policy 3.16:*** *Actively seek federal, state, and private foundation grant funds for park and recreation facilities in unincorporated areas, including dual-use storm drainage ponding basins/recreation parks.*
- ***Housing Policy 3.23:*** *Prepare new and/or updated community plans that provide adequate sites for a variety of types of housing within the development boundaries of community.*
- ***Guiding Principle 4.1:*** *Support and encourage County ordinances, standards, practices and procedures that promote residential energy conservation.*
- ***Housing Policy 4.11:*** *Review residential projects for environmental impacts and impose conditions to reduce those impacts.*
- ***Housing Policy 4.12:*** *Facilitate land use policies and programs that meet housing and conservation objectives.*
- ***Housing Policy 4.13:*** *Promote energy efficiency and water conservation.*
- ***Housing Policy 4.14:*** *Enforce the requirements of County Ordinances regarding the disposal of construction and demolition debris.*
- ***Housing Policy 4.15:*** *Enforce energy Efficiency Standards for Residential and Non-Residential properties (Title 24).*
- ***Housing Policy 4.21:*** *Promote energy conservation opportunities in new residential development.*
- ***Housing Policy 4.22:*** *Enforce provisions of the Subdivision Map Act regulating energy-efficient subdivision design.*
- ***Housing Policy 5.21:*** *Administer and enforce the relevant portions of the Health and Safety Code.*
- ***Housing Policy 5.26:*** *Prohibit concentrations of dwelling units near potentially incompatible agricultural uses as defined in the Animal Confinement Facilities Plan.*

3.14.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Population and Housing" a project is considered to have a significant impact on the environment if it would:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) (CEQA Appendix G Threshold (a))?

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere (CEQA Appendix G Threshold (b))?

3.14.5 Methodology of Analysis

The following points were considered in the Population and Housing evaluation:

- The Project would create a water storage reservoir, which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.

3.14.6 Project-Level Impacts and Mitigation Measures

3.14.6.1 Induce Substantial Unplanned Population

Impact Statement

Impact POP-1: *Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

The Project would employ 7 to 12 people during the excavation and construction phases, which is less than the baseline of 10 to 18 employees associated with aggregate operations on the Seaborne site (baseline). The operation of the reservoir would be managed remotely primarily by TID employees from TID's offsite administrative office in Tulare, California. The Project would not require hiring additional TID employees. This would not induce substantial population growth in the area. The Project would not induce growth, growth would occur whether or not the Project is implemented.

The Project would have no impact on population and housing.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.14.6.2 Displace Substantial Numbers of Existing People/Housing

Impact Statement

Impact POP-2: *Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

There are no houses located on the Project site; therefore, the Project would not result in the displacement of any existing housing. The Project would have no impact on population and housing.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.14.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3-1 – Cumulative

Projects, only three (3) cumulative projects are within 1-mile of the Project (2 are existing aggregate mining operations, and 1 is a community plan update) while three (3) other projects are located within 3 miles of the Project (1 existing aggregate mining operation, 1 residential sub-division, and 1 stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the Project site. Therefore, these projects are not considered to have a potential cumulative impact related to population and housing.

As discussed in this Section, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies. The Project would have no impacts. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to population and housing.

3.15 PUBLIC SERVICE

3.15.1 Introduction

This section of the DEIR presents a discussion of public service resources. A review of potential Project impacts is provided in the following analysis.

3.15.2 Environmental Setting

3.15.2.1 Regional and Local Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map in Section 2.0 – Project Description). The figures in Section 2.0 – Project Description illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural and, to a limited extent, for rural residential purposes.

3.15.3 Regulatory Setting

3.15.3.1 Federal

There are no federal public service regulations that directly affect the Project.

3.15.3.2 State

There are no state public service regulations that directly affect the Project.

3.15.3.3 Local

Tulare County General Plan

The Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)", with a General Plan designation of "Valley Agriculture". The General Plan has a number of public service policies that apply to projects within Tulare County. General Plan policies that potentially relate to the proposed Project are listed below.

- ***PFS-7.1 Fire Protection:*** *The County shall strive to expand fire protection service in areas that experience growth in order to maintain adequate levels of service.*
- ***PFS-7.2 Fire Protection Standards:*** *The County shall require all new development to be adequately served by water supplies, storage, and conveyance facilities supplying adequate volume, pressure, and capacity for fire protection.*
- ***PFS-7.3 Visible Signage for Roads and Buildings:*** *The County shall strive to ensure all roads are properly identified by name or number with clearly visible signs.*

- ***PFS-7.5 Fire Staffing and Response Time Standards:*** *The County shall strive to maintain fire department staffing and response time goals consistent with National Fire Protection Association (NFPA) standards.*

Table 3.15-1. Fire Staffing and Reponses Time Standards

Land Use	Demographics	Staffing/Response Time	% of Calls
Urban	> 1,000 people/sq. mi.	15 FF/9 min.	15 FF/9 min.
Suburban	500-100 people/sq. mi.	10 FF/10 min.	80
Rural	< 500 people/sq. mi.	6 FF/14 min.	80
Remote*	Travel Dist. > 8 min.	4 FF/no specific response time	90
*Upon assembling the necessary resources at the emergency scene, the fire department should have the capacity to safety commence an initial attach within 2 minutes, 90% of the time. (FF = Fire Fighters) Source: Tulare County General Plan 2030 Update			

- ***PFS-7.6 Provision of Station Facilities and Equipment:*** *The County shall strive to provide sheriff and fire station facilities, equipment (engines and other apparatus), and staffing necessary to maintain the County's service goals. The County shall continue to cooperate with mutual aid providers to provide coverage throughout the County.*
- ***PFS-7.8 Law Enforcement Staffing Ratios:*** *The County shall strive to achieve and maintain a staffing ratio of 3 sworn officers per 1,000 residents in unincorporated areas.*
- ***PFS-7.9 Sheriff Response Time:*** *The County shall work with the Sheriff's Department to achieve and maintain a response time of:*
    - *Less than 10 minutes for 90 percent of the calls in the valley region; and*
    - *15 minutes for 75 percent of the calls in the foothill and mountain regions.*
- ***PFS-7.12 Design Features for Crime Prevention and Reduction:*** *The County shall promote the use of building and site design features as means for crime prevention and reduction.*
- ***PFS-8.1 Work with Local School Districts:*** *The County shall work with local school districts to develop solutions for overcrowded schools and financial constraints of constructing new facilities.*
- ***PFS-8.4 Library Facilities and Services:*** *The County shall encourage expansion of library facilities and services as necessary to meet the needs (e.g., internet access, meeting rooms, etc.) of future population growth.*

3.15.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Public Services" a project is considered to have a significant impact on the environment if it would:

a) Result in physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain

acceptable service ratios, response times or other performance objectives for any of the public services (CEQA Appendix G Threshold (a)):

i. Fire protection?
ii. Police protection?
iii. Schools?
iv. Parks?
v. Other public facilities?

3.15.5 Methodology of Analysis

The following points were considered in the Public Service evaluation:

- The Project would create a water storage reservoir, which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.

3.15.6 Project-Level Impacts and Mitigation Measures

3.15.6.1 Physically Altered Governmental Facilities

Impact Statement

Impact PUB-1: *Would the Project result in physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services* **(CEQA Guidelines – Appendix G Threshold Criteria (a))***:*

vi. Fire protection?
vii. Police protection?
viii. Schools?
ix. Parks?

x. Other public facilities?

Impact Analysis

The Project would not result in additional employee and vendor vehicles/on-road haul trucks on public roadways above baseline levels. Therefore, the Project would not interfere with public services such as fire and police protection. The Project would not involve any activities that would impacts schools, parks, public services or communications. Potential impacts associated with noise, air quality, odor, and water quality are fully evaluated in Section 3.0 – Environmental Impact Analysis.

Therefore, the Project would have no impact on public services.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.15.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in this Section, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to public services.

3.16 RECREATION

3.16.1 Introduction

This section of the DEIR presents a discussion of recreation resources. A review of potential Project impacts is provided in the following analysis.

3.16.2 Environmental Setting

3.16.2.1 Regional and Local Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 mile to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map). These figures illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural and, to a limited extent, for rural residential purposes.

Most of the Project site is vegetated with non-native grasses except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs. The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. The Project site topography is relatively level with a depression in the southeast corner. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The Project site elevation decreases from approximately 472-feet above mean sea level (amsl) on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end.

3.16.3 Regulatory Setting

The Project is subject to a variety of land use regulatory requirements and designations, which are discussed fully in the sections to follow.

3.16.3.1 Federal

United States National Park Service (NPS)

The National Park Service (NPS) is a bureau of the U.S. Department of the Interior. The NPS manages the 397 units of the National Park System. The NPS also helps administer dozens of affiliated sites, the National Register of Historic Places, National Heritage Areas, National Wild and Scenic Rivers, National Historic Landmarks, and National Trails.

3.16.3.2 State

California Department of Parks and Recreation

The California Department of Parks and Recreation aims to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

California's state parks and the recreational programs supported by the California Department of Parks and Recreation and its divisions of Boating and Waterways, Off-Highway Motor Vehicle Recreation, and Office of Historic Preservation, are gateways to these benefits and to opportunities to connect with families, friends, and communities. With 280 state park units, over 340 miles of coastline, 970 miles of lake and river frontage, 15,000 campsites, and 4,500 miles of trails, the department contains the largest and most diverse recreational, natural, and cultural heritage holdings of any state agency in the nation.

More than 75 million people annually visit California's State Park System. The system includes:

- Beaches Museums
- Coastal Beaches Natural and Cultural Preserves
- Conference Centers Natural Reserves
- Ghost Towns Off-Highway Vehicle Recreation Areas
- Historic Homes Parks
- Historic Monuments Recreation Areas
- Historic Parks Seashores
- Lakes and Reservoirs Spanish-era Adobe Buildings
- Lighthouses Visitor Centers
- Marine parks

Together, state park system lands protect and preserve an unparalleled collection of culturally and environmentally sensitive structures and habitats, threatened plant and animal species, ancient Native American sites, historic structures and artifacts.

3.16.3.3 Local

Tulare County General Plan

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that potentially relate to the proposed Project are listed below.

- ***ERM-5.2 Park Amenities:*** *The County shall provide a broad range of active and passive recreational opportunities within community parks. When possible, this should include active sports fields and facilities, community center/recreation buildings, children's play areas, multiuse areas and trails, sitting areas, and other specialized uses as appropriate.*

- ***ERM-5.3 Park Dedication Requirements:*** *The County shall require the dedication of land and/or payment of fees, in accordance with local authority and State law (for example the Quimby Act), to ensure funding for the acquisition and development of public recreation facilities.*
- ***ERM-5.5 Collocated Facilities:*** *The County shall encourage the development of parks near public facilities such as schools, community halls, libraries, museums, prehistoric sites, and open space areas and shall encourage joint-use agreements whenever possible.*
- ***ERM-5.11 Cooperation with Federal and State Agencies:*** *The County shall work with Federal and State agencies that manage land within the County, as appropriate.*
- ***ERM-5.12 Meet Changing Recreational Needs:*** *The County shall promote the continued and expanded use of national and State forests, parks, and other recreational areas to meet the recreational needs of County residents.*
- ***ERM-5.15 Open Space Preservation:*** *The County shall preserve natural open space resources through the concentration of development in existing communities, use of cluster development techniques, maintaining large lot sizes in agricultural areas, discouraging conversion of lands currently used for agricultural production, limiting development in areas constrained by natural hazards, and encouraging agricultural and ranching interests to maintain natural habitat in open space areas where the terrain or soil is not conducive to agricultural production.*

3.16.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Recreation" a project is considered to have a significant impact on the environment if the following are found to be true:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated (CEQA Appendix G Threshold (a))?

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment (CEQA Appendix G Threshold (b))?

3.16.5 Methodology of Analysis

The following points were considered in the Recreation evaluation:

- The Project would create a water storage reservoir, which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.

- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.

3.16.6 Project-Level Impacts and Mitigation Measures

3.16.6.1 Increase use of regional parks/other recreational facilities

Impact Statement

Impact REC-1: *Would the Project would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

The number of employees needed for the Project operations would be a decrease from baseline. As a result, any use of recreational facilities resulting from Project implementation would not result in physical deterioration, and thus no impacts would result.

The Project does not include or require recreational facilities; therefore, no impacts would result.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.16.6.2 Require Construction/Expansion of Recreational Facilities

Impact Statement

Impact REC-2: *Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

The number of employees needed for the Project operations would be a decrease from baseline. As a result, any use of recreational facilities resulting from Project implementation would not result in physical deterioration, and thus no impacts would result.

The Project does not include or require recreational facilities; therefore, no impacts would result.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.16.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Specifically, as summarized in Table 3-1 – Cumulative Projects, only three (3) cumulative projects are within 1-mile of the Project (2 are existing aggregate mining operations, and 1 is a community plan update) while three (3) other projects are located within 3 miles of the Project (1 existing aggregate mining operation, 1 residential sub-division, and 1 stormwater retention basin). The remainder of cumulative projects considered are located greater distances from the

Project site. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in this Section, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to recreational facilities.

3.17 TRANSPORTATION

3.17.1 Introduction

This section of the DEIR presents a discussion of transportation. A review of potential Project impacts is provided in the following analysis. Additionally, see the traffic report prepared by Associated Transportation Engineers (ATE) and the Vehicle Miles Travelled (VMT) analysis prepared by Sespe Consulting, Inc. (Sespe) in Appendix I for additional detail.

3.17.2 Environmental Setting

3.17.2.1 Regional and Local Setting

Tulare County is located in a geographically diverse encompassing approximately 4,840 square miles of classified lands (lands with identified uses) and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and, a mountain region just east of the foothills. The eastern half of the County is generally comprised of public lands, including the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. Federal lands, which include wilderness, national forests, monuments and parks, along with County parks, make up 52% of the County. Agricultural uses, which include row crops, orchards, dairies, and grazing lands on the Valley floor and in the foothills total over 2,020 square miles or about 43% of the entire County. Urban uses such as incorporated cities, communities, hamlets, other unincorporated urban uses, and infrastructure rights-of-way make up the remaining land in the County.

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map in Section 2.0 – Project Description). The figures in Section 2.0 – Project Description illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural and, to a limited extent, for rural residential purposes.

Excavated and processed materials would be loaded directly on to on-road haul trucks within the Project site. Once loaded, the on-road haul trucks would exit the Project site via the privately owned access road on the Seaborn site (owned by TID and CPDC) which connects to Road 222. From there the material would be transported to West Coast Sand and Gravel's (WCSG's) customers via public roads. The number of on-road haul trucks on public roads associated with WCSG's sale of the processed material would not increase from the baseline level of on-road truck traffic (160 trips per day) leaving from TID's access road. The number of on-road haul trucks carrying the processed aggregate as well as the number of on-road trucks needed for the transport of other materials (recycled concrete and asphalt, excess fines, blending materials) being exported or imported to or from the site would not be allowed to exceed the baseline production rate from the previous operations at the Seaborn site (average of 500,000 TPY and a maximum

of 650,000 TPY). A copy of the applicable traffic analyses prepared by ATE and Sespe are provided in Appendix I.

The excavation phase of the Project would require only 7 to 12 onsite employees. This would be consistent with the baseline number of employees previously required during the mining and processing activities at the Seaborn site. For evaluation purposes, it is assumed that each employee would make 2 trips per day (inbound and outbound). This would result in a maximum of 24 trips on peak days, assuming all 12 employees are onsite as compared to the 35 employee trips per day during mining and processing activities at the Seaborn site. As a result, the Project would generate only nominal automobile traffic on public roadways, which would not result in a significant increase from baseline operations at the Seaborn site (see analyses provided in Appendix I).

Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site (Figure 2-5 – Project Excavation Site Plan in Section 2.0 – Project Description).

Note that a single-way trip is referred to as a "trip" and a round trip (going from the WCSG facility to their customers and the return trip by the on-road truck back to the facility) is referred to as a "load" (two one-way trips).

3.17.3 Regulatory Setting

The Project is subject to a variety of land use regulatory requirements and designations, which are discussed fully in the sections to follow.

3.17.3.1 Federal

There are no federal transportation regulations that directly affect the Project.

3.17.3.2 State

Caltrans: Transportation Concept Reports

The California Department of Transportation (Caltrans) has prepared a number concept reports for State Routes, Interstate Routes, and U.S. Routes for each of its California Districts. Tulare County is located in Caltrans District 06. The concept reports that apply to the proposed Project include State Route (SR) 63 and SR 201.

Caltrans Guide for the Preparation of Traffic Impact Studies

Caltrans has developed this "Guide for the Preparation of Traffic Impact Studies" in response to a survey of cities and counties in California. The purpose of that survey was to improve the Caltrans local development review process (also known as the Intergovernmental Review/California Environmental Quality Act or IGR/CEQA process). The survey indicated that approximately 30 percent of the respondents were not aware of what Caltrans required in a traffic impact study (TIS).

Senate Bill (SB) 743

The California legislature enacted Senate Bill (SB) 743 in 2013, which required, among other things, that the Office of Planning and Research (OPR) adopt the new CEQA Guidelines Section 15064.3 – Determining the Significance of Transportation Impacts for assessing transportation impacts. OPR has replaced roadway capacity and vehicle delay measures, often displayed as Level of Service (LOS), with VMT, which estimates the total distance people drive by vehicle. Additionally, the Natural Resources Agency adopted revisions to the CEQA Guidelines, which included updates to the Appendix G, Environmental Checklist Form. The revisions were approved by the Office of Administrative Law and filed with the Secretary of State on December 28, 2018. This DEIR section includes the new Appendix G questions for the transportation impact area.

OPR developed interim guidance in December 2018 entitled, "Technical Advisory on Evaluating Transportation Impacts in CEQA" (Technical Advisory) for automobile VMT (i.e., light-duty vehicles). The OPR Technical Advisory provides non-binding technical advice, and is not a formal administrative regulation, like the CEQA Guidelines. However, it does provide a reasonable framework for lead agencies as they implement the updated transportation CEQA Guidelines. This VMT analysis applies the thresholds provided in this OPR Technical Advisory document.

3.17.3.3 Local

Tulare County Transportation Control Measures (TCM)

Transportation Control Measures (TCM) are designed to reduce vehicle miles traveled, vehicle idling, and/or traffic congestion in order to reduce vehicle emissions. Currently, Tulare County is a nonattainment region under the Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA). Both of these acts require implementation of TCMs. These TCMs for Tulare County are as follows:

- Rideshare Programs;
- Park and Ride Lots;
- Alternate Work Schedules;
- Bicycle Facilities;
- Public Transit;
- Traffic Flow Improvement; and
- Passenger Rail and Support Facilities.

Tulare County Association of Governments (TCAG)

The Regional Transportation Plan is a long-range plan that every Metropolitan Planning Organization (MPO) is required to complete. The plan is meant to provide a long-range, fiscally constrained guide for the future of Tulare County's transportation system. The long-range plan extends to the year 2042 in its scope. The plan accomplishes its goals by forecasting future growth, identifying regional priorities, and planning for infra-structure improvements. This plan is required to include four elements; those elements include: the policy element, the sustainable community element, the action element and the financial element. These elements have been mandated by law, but do not keep MPOs from including more

elements to their plan de-pending on local characteristics. Tulare County's 2018 RTP/SCS also includes chapters on goods movement and valley wide characteristics in addition to the required plan elements. The RTP/SCS is not the only plan in effect dealing with transportation issues, but is the holistic plan that integrates more specific plans into a larger framework for the county. The Tulare County Association of Government has prepared the 2018 Regional Transportation Plan.

Tulare County General Plan

The Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)", with a General Plan designation of "Valley Agriculture". The Project is also located within a designated Mineral Resource Area (MRZ-2b) as determined by the California Department of Conservation (Department of Conservation, 1997) and referenced in County General Plan (Tulare County, 2012).

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that potentially relate to the proposed Project are listed below.

LU-7.3 Friendly Streets: *The County shall encourage new streets within UDBs to be designed and constructed to not only accommodate traffic, but also serve as comfortable pedestrian and cyclist environments. These should include, but not be limited to:*

1. *Street tree planting adjacent to curbs and between the street and sidewalk to provide a buffer between pedestrians and automobiles, where appropriate,*
2. *Minimize curb cuts along streets,*
3. *Sidewalks on both sides of streets, where feasible,*
4. *Bike lanes and walking paths, where feasible on collectors and arterials, and*
5. *Traffic calming devices such as roundabouts, bulb-outs at intersections, traffic tables, and other comparable techniques.*

LU-7.4 Streetscape Continuity: *The County shall ensure that streetscape elements (e.g., street signs, trees, and furniture) maintain visual continuity and follow a common image for each community.*

LU-7.6 Screening: *The County shall require landscaping to adequately screen new industrial uses to minimize visual impacts.*

TC-1.14 Roadway Facilities: *As part of the development review process, new development shall be conditioned to fund, through impact fees, tonnage fees, and/or other mechanism, the construction and maintenance of roadway facilities impacted by the project. As projects or locations warrant, construction or payment of pro-rata fees for planned road facilities may also be required as a condition of approval.*

TC-1.15 Traffic Impact Study: *The County shall require an analysis of traffic impacts for land development projects that may generate increased traffic on County roads. Typically, applicants of projects generating over 100 peak hour trips per day or where LOS "D" or worse occurs, will be required to prepare and submit this study. The traffic impact study will include impacts from all vehicles, including truck traffic.*

TC-1.16 County Level of Service (LOS) Standards: *The County shall strive to develop and manage its roadway system (both segments and intersections) to meet a LOS of "D" or better in accordance with the LOS definitions established by the Highway Capacity Manual.*

TC-5.3 Provisions for Bicycle Use: *The County shall work with TCAG to encourage local government agencies and businesses to consider including bicycle access and provide safe bicycle parking facilities at office buildings, schools, shopping centers, and parks.*

TC-5.4 Design Standards for Bicycle Routes: *The County shall utilize the design standards adopted by Caltrans and as required by the Streets and Highway Code for the development, maintenance, and improvement of bicycle routes.*

TC-5.8 Multi-Use Trails: *The County shall encourage the development of multi-use corridors (such as hiking, equestrian, and mountain biking) in open space areas, along power line transmission corridors, utility easements, rivers, creeks, abandoned railways, and irrigation canals.*

HS-1.9 Emergency Access: *The County shall require, where feasible, road networks (public and private) to provide for safe and ready access for emergency equipment and provide alternate routes for evacuation.*

Complete Streets Policies

Complete Street Goals

The purpose of the RMA Complete Streets Policy is to create a comprehensive and uniform Complete Streets vision and policy for Tulare County. This will allow the implementing entities to incorporate Complete Streets guidelines and standards into both development and redevelopment actions. The County's goals are:

- *Tulare County's transportation network will be supported through a variety of feasible transportation choices, which allows for sustainable growth.*
- *The livability of neighborhoods and commercial centers located along the County's transportation corridors will be enhanced by a safe and inviting pedestrian environment.*
- *The design of multimodal roadway facilities will not compromise the needs of larger vehicles such as transit vehicles, fire trucks and freight delivery trucks.*
- *Inclusion of Complete Streets design elements will allow for design flexibility on different street functions and neighborhood contexts.*
- *Inclusion of Complete Streets design elements will improve the integration of land use and transportation, while encouraging economic revitalization through infrastructure improvements.*

Complete Streets Objectives

- *To create an integrated and connected transportation network that supports transportation choices and sustainable growth.*
- *To ensure that all transportation modes are accommodated to the extent possible in all public roadway facilities in the County.*
- *To develop and use the latest design standards and guidelines in the design of Complete Streets.*
- *To provide flexibility in the implementation of this policy so that streets chosen for implementation of Complete Streets elements can be developed to fit within the context of their*

principal purpose and surroundings without compromising the safety of users and needs of larger vehicles.

Tulare County General Plan Policies

The Tulare County General Plan Update (2030) in complying with AB 1358 calls for 4 Complete Streets related principles including:

- *Principle 1: County-wide Collaboration - Support countywide transportation plans that provide choices in travel modes.*
- *Principle 2: Connectivity - Emphasize connectivity among cities, communities, and hamlets to ensure County residents have access to jobs and services.*
- *Principle 3: Community Circulation - Anticipate and provide transit, traffic, and roadway connections that support the interconnectivity of all communities.*
- *Principle 4: Pedestrian and Bicycle Facilities - Plan for the development and expansion of pedestrian paths and bicycle facilities that provide residents with alternative modes of travel.*

These principles are expressed mainly in following policies including:

- *TC-1.6 Intermodal Connectivity*
- *TC-1.7 Intermodal Freight Villages*
- *TC-5.1 Bicycle/Pedestrian Trail System*
- *TC-5.2 Non-motorized Modes in Planning and Development*

3.17.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Transportation" a project is considered to have a significant impact on the environment if it would:

a) *Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities (CEQA Appendix G Threshold (a))?*

b) *Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) (CEQA Appendix G Threshold (b))?*

c) *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (CEQA Appendix G Threshold (c))?*

d) *Result in inadequate emergency access (CEQA Appendix G Threshold (d))?*

3.17.5 Methodology of Analysis

The following points were considered in the Transportation evaluation:

- The Project would create a water storage reservoir which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.

- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.
- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from existing baseline levels.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.

3.17.6 Project-Level Impacts and Mitigation Measures

3.17.6.1 Conflict With Program Plan

Impact Statement

Impact TRAN-1: *Would the Project conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

Because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would not be increased. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. Therefore, the Project would not interfere with transportation or result in an increase of local traffic. The routine operation of the reservoir would be conducted remotely from TIDs offsite office and would not result in a significant increase in TID employees.

The distance or vehicle mile traveled (VMT) to and from the site to deliver product to WCSG's customers in the region would not significantly change from the VMT associated with the Seaborn operations.

The Project would not include design features that would increase hazards on the public roads. The existing access road has been and would continue to provide adequate emergency access to and from the Project site.

Therefore, the Project would have no impact on transportation or traffic. Refer to the traffic report prepared by ATE and the VMT analysis prepared by Sespe which provide additional detail and analysis to

support the determination that there would be no Project impacts related to transportation and/or traffic (Appendix I).

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.17.6.2 Inconsistent with CEQA Guidelines Section 15064.3

Impact Statement

Impact TRAN-2: *Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

As discussed above and in the VMT analysis prepared by Sespe (Appendix I2), because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would not be increased. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. Therefore, the Project would not interfere with transportation or result in an increase of local traffic. The routine operation of the reservoir would be conducted remotely from TIDs offsite office and would not result in a significant increase in TID employees. Additionally, the distance or vehicle mile traveled (VMT) to and from the site to deliver product to WCSG's customers in the region would not significantly change from the VMT associated with the Seaborn operations.

In accordance with Section 15064.3 of the CEQA Guidelines, as well as the requirements of SB 743 described above, the Tulare County advisory provides "screening thresholds" for identifying whether a land use project should be expected to result in a less than significant transportation impact under CEQA. Projects meeting one or more of these criteria would not be required to undergo a detailed VMT analysis. One of the screening thresholds is described as "Small Projects". Small projects are presumed to have a less than significant transportation impact. The County guidelines define a small project to be a project that generates less than 500 trips per day.

The proposed Project would fall within the small project category since the Project is expected to generate 24 daily automobile trips on peak days, which is less than the 500-trip threshold. Therefore, the project would "screen out", and be expected to have less than significant transportation impacts.

For these reasons, the Project would have no impact on transportation or traffic. Refer to the traffic report prepared by ATE and the VMT analysis prepared by Sespe to support the determination that there would be no impact related to transportation and/or traffic (Appendix I2).

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.17.6.3 Substantially Increase Hazards Due to a Geometric Design

Impact Statement

Impact TRAN-3: *Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?* **(CEQA Guidelines – Appendix G Threshold Criteria (c))**

Impact Analysis

Because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would not be increased. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. Therefore, the Project would not interfere with transportation or result in an increase of local traffic.

The Project would not include design features that would increase hazards on the public roads. Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site (Figure 2-5 – Project Excavation Site Plan in Section 2.0 – Project Description). There are no proposed or required changes to existing public roadways, intersections, or other public access points. The existing access road has been and would continue to provide adequate emergency access to and from the Project site.

For these reasons, the Project would have no impact on transportation or traffic.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.17.6.4 Inconsistent with CEQA Guidelines Section 15064.3

Impact Statement

Impact TRAN-4: *Would the Project result in inadequate emergency access?* **(CEQA Guidelines – Appendix G Threshold Criteria (d))**

Impact Analysis

See responses to CEQA Criteria *a)* through *c)* above. Because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would not be increased. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. Therefore, the Project would not interfere with transportation or result in an increase of local traffic. The routine operation of the reservoir would be conducted remotely from TIDs offsite office and would not result in a significant increase in TID employees.

As discussed above, the Project would not include design features, nor would it alter any existing roadways or access points that would increase hazards on the public roads. Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site. The existing access road has been and would continue to provide adequate emergency access to and from the Project site.

Therefore, the Project would have no impact on transportation or traffic. A traffic report was prepared by ATE to support the determination that there would be no impact related to transportation and/or traffic (Appendix I).

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.17.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in this Section, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to transportation.

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3.18 TRIBAL CULTURAL RESOURCES

3.18.1 Introduction

This section of the DEIR addresses potential effects that may cause a substantial adverse change in the significance of a tribal cultural resource as required by the California Public Resource Code (PRC) section 21074, commonly referred to as Assembly Bill (AB) 52. AB 52 requires a lead agency (in this instance, the Tulare Irrigation District) to evaluate a project's potential to impact tribal cultural resources and establishes a consultation process for California Native American Tribes that are traditionally and culturally affiliated with the geographic area of certain proposed projects. The lead agency must initiate the formal AB 52 consultation process if requested in writing by the tribe. This section of the DEIR describes the AB 52 process that TID has conducted in consultation with the County, and the response(s) from potentially affected tribes.

Tribal cultural resources are also discussed in a more generally in DEIR Section 3.3 – Cultural Resources.

3.18.2 Environmental Setting

As discussed in Section 3.3 – Cultural Resources, cultural resources consist of remains and sites associated with past human activities. These include prehistoric Native American archaeological sites, historic archaeological sites, and historic sites, buildings, structures or objects. They also include traditional cultural properties or areas such as Native American sacred sites that have been, and often continue to be, of special economic and/or religious significance.

The distinction between Cultural Resources and Tribal Cultural Resources (TCR) is that Cultural Resources are generally considered as archaeological or paleontological resources which are typically beneath the surface of the ground and are discovered or uncovered through disturbance of the site, whereas TCRs are described as a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a Native American tribe. TCRs are not necessarily visible or archaeological and are often religious or spiritual in nature. In addition, a tribe that may have TCRs that could be affected and may not be located near a proposed project site. The appropriate regional and project setting to be included in the evaluation of TCRs is determined by discussions and interactions between the County, the Native American Heritage Commission (NAHC) and Tribes as identified by the NAHC.

3.18.2.1 Regional Setting

The Project is located on the north side of the confluence of the St. Johns River and the Lower Kaweah River, near Woodlake in Tulare County. The Kaweah River flows from a canyon in the Sierra Nevada approximately 3 miles to the northeast. The Kaweah is one of a number of rivers (including the Kern, Tule, and Kings) that deposit low-gradient fans along the eastern San Joaquin Valley and drain the western slopes of the Sierra Nevada range.

Regionally, natural conditions and resources have greatly influenced human occupation and resource utilization. The presence of archaeological and historic resources, including TCRs, would generally be most likely along rivers and streams and in other areas with ground cover or other features which could have invited and sustained habitation. Extensive accounts of California and local prehistory, ethnography, and history are provided below and in the Cultural Resource Investigation (Applied EarthWorks, Inc., 2021) in Appendix E.

As discussed in Section 3.3 – Cultural Resources, the Project area is within the homeland of the Gáwea (or Kaweah) Yokuts (Kroeber 1976: 480; Latta 1999:187–188), one of the many autonomous tribes that make up the Southern Valley Yokuts ethnolinguistic group. At the time of first contact with the Spanish missionaries, the Yokuts people, including northern valley and foothill groups, collectively inhabited the San Joaquin Valley as well as the eastern foothills of the Sierra Nevada from the Calaveras River southward to the Kern River (Wallace 1978a, 1978b). The Yokuts language belongs to the broader Penutian family, which subsumes a relatively diverse assemblage of languages, including Miwok, Costanoan, Maiduan, and Wintuan (Silverstein 1978). Compared to other Penutian languages, however, Yokuts shows considerable internal linguistic homogeneity, especially given the extent of its geographic distribution. Dialects differ minimally and were mutually intelligible, at least among individuals from contiguous groups. This relative lack of linguistic differentiation suggests that ancestors of the Yokuts entered California after the arrival and subsequent radiation of the more linguistically diverse Penutian groups such as the Miwok and Costanoan (Moratto 1984:554).

The basic unit of Yokuts society was the nuclear family, which was identified with a totem symbol specific to the paternal line. Within each tribe, lineage totems were further grouped into one of two moieties, designated by the overarching symbols of the eagle and coyote (Wallace 1978b:453). The basic political unit was the tribe or tribelet, which encompassed a single village or several settlements (Kroeber 1976).

Tulare Lake and its tributary rivers, including the Kaweah and the St. Johns, were a central part of Southern Valley Yokuts subsistence, providing food, building material, and avenues of travel for small watercraft. Not surprisingly, most Yokuts villages were situated near major waterways or around Tulare Lake (Wallace 1978b:448). For example, the main Gáwea village, also known as Gáwea, was situated on the north side of the Kaweah River at the current location of Terminus Dam (Latta 1999:188). The rivers provided fish, waterfowl, and other game attracted to the fresh water. The tule stalk was used in the manufacture of mats, baskets, and other goods (Wallace 1978b:451).

Most flaked stone artifacts were fashioned from obsidian and other imported material (Wallace 1978b:452). Ground stone artifacts, inclusive of handstones and milling slabs/slicks as well as mortars and pestles, were manufactured of granitic and metavolcanics rock. Where suitable outcrops were available, milling slicks and bedrock mortars were manufactured on bedrock. Where bedrock was not available, portable mortars and slabs manufactured from large cobbles and small boulders were used.

At the broader interregional level, the villages of the Southern Valley Yokuts profited from the east-west trade of goods that flowed between the Pacific coast and the high Sierra and Great Basin (Davis 1961).

The Yokuts bartered their local staples (e.g., freshwater fish, acorns, and tule reeds) to obtain such goods as Olivella beads and other shell material from the west as well as obsidian from the east.

As with other Indian groups in California, the lifeways of the Yokuts were dramatically altered as a result of contact with Spanish explorers and missionaries, miners, ranchers, and other immigrants who entered the San Joaquin Valley after 1700. In 1856, the Tule River Indian Reservation was established for the Koyeti and Yaudanchi tribes. The reservation was moved from its original site just east of Porterville, designated as State Historical Landmark #388, to its present location in 1873 (Tule River Indian Tribe 2011). As late as 1926, adobe ruins from the original reservation were still present (Small 1926:469). The introduction of European culture and new diseases proved devastating to the native population. In the 1860s, smallpox decimated Indians living at the Cobble Lodge site (CA-TUL-145) near Lake Kaweah (Moratto 1984:331).

There are several Native American tribal groups with ancestral ties to the Project area, including the Santa Rosa Rancheria Tachi Yokut Tribe, Tule River Indian Tribe, and the Wuksache Indian Tribe/Eshom Valley Band. Several Southern Valley Yokuts tribes have survived the effects of colonization. Yokuts today have developed language apprenticeship programs and early childhood education centers to serve tribal members, including the Wukchumne of the Tule-Kaweah near Porterville, Choynimni speakers of the Kings River tribes, Chukchansi at the Picayune and Table Mountain rancherias near Fresno, and Yawelmani speakers of the Tule River Reservation (Golla 2011:154). Several Yokuts tribal groups are governed by elders' councils and operate auxiliary departments that serve local tribal populations in areas of healthcare, education, and cultural resource management.

3.18.2.2 Vicinity Setting

As described in Section 3.3 – Cultural Resources, Applied EarthWorks, Inc. (*Æ*) conducted various records searches to determine the presence of prehistoric or historic resources, including Native American cultural resources, on and in the vicinity of the Project. Specifically, a cultural resources records search, additional research, intensive-level pedestrian field survey, and a Sacred Lands File Search with the Native American Heritage Commission were conducted. Extensive accounts of California and local prehistory, ethnography, and history are provided in the Cultural Resources Survey (Applied EarthWorks, Inc., 2021), which is provided in Appendix E, and should be consulted for more detailed information. The results of these searches and field surveys are described in Sections 3.18.2.2 and 3.18.5 below.

3.18.2.3 Project Site Setting

As described in Section 3.3 – Cultural Resources, the existing Project site and surrounding survey area is currently used as a cow pasture and is covered in seasonal grasses with a sparse scatter of live oaks, maples, and cottonwood trees. Cattle have recently eaten most of the grass cover, and mineral soil is visible throughout the proposed reservoir locations. Vegetation is dense in the reserved habitat area in the southeastern portion of the Project area. Approximately 90 percent of the survey area exhibited 60 percent or better ground visibility. The one exception is the westernmost end of the reserved habitat area, where dense berry vines and oak and maple trees resulted in poor ground visibility and prevented systematic transects. At these locations, the crew walked existing cattle trails, venturing into denser

vegetation where feasible to look for features and artifacts. Ground visibility in the western portion of the reserved habitat area was approximately 10 percent.

Æ archaeologists conducted a detailed pedestrian survey of the Project area using 15- to 20-meter transects on October 7 and 11, 2013. A follow up pedestrian survey of the Project area was conducted by *Æ* on January 12, 2021. The approximately 175-acre survey area encompassed the 168 acres proposed for the Project, including the reservoir locations and habitat area (Figure 3.3-1). *Æ* also surveyed the banks of the St. Johns River adjacent to the Project's southern boundary.

To determine the potential presence of prehistorical and TCR at or near the Project site, *Æ* archaeologists conducted intensive-level pedestrian field survey(s) of the Project area using 15- to 20-meter transects in 2013 and subsequently in 2021. The approximately 175-acre survey area encompassed the 168 acres proposed for the Project, including the reservoir locations and habitat area. *Æ* also surveyed the banks of the St. Johns River adjacent to the Project's southern boundary (see the Cultural Resource Investigation in Appendix E). *Æ*'s survey for the Project resulted in the discovery of two (2) isolated artifacts – one (1) from the historic era (P-54-005095/AE-2193-2) and one (1) that is prehistoric P-54-005096 (AE-2193-3). P-54-005096 is an isolated basalt flake (Figure 3.3-2 through Figure 3.3-8 in Section 3.3 – Cultural Resources). The flake is 4.5 centimeters long by 1.3 centimeters wide by 0.8 centimeters thick. It appears to be a secondary core reduction flake with no cortex. Three flake scars are present on its dorsal side.

According to *Æ*'s report (Appendix E), this isolated basalt flake is not considered a TCR. Isolates by definition lack association with other artifacts or features and cannot typically be associated with specific individuals or historic events. There were no other potential TCRs discovered within or near the Project site.

3.18.3 Regulatory Setting

3.18.3.1 Federal

Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3001-3013) describes the rights of Native American lineal descendants, Indian tribes, and Native Hawaiian organizations with respect to the treatment, repatriation, and disposition of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (referred to collectively as cultural items), with which they can show a relationship of lineal descent or cultural affiliation.

One of the major purposes of the statute is to provide greater protection for Native American burial sites and more careful control over the removal of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony on Federal and tribal lands. The kinds of remains and the artifacts covered by provisions of the statute are: (1) human remains and associated funerary objects; (2) unassociated funerary objects; (3) sacred objects; and (4) objects of cultural patrimony. NAGPRA requires that Indian tribes or Native Hawaiian organizations be consulted whenever archeological investigations encounter, or are expected to encounter, Native American cultural items or when such items are

unexpectedly discovered on Federal or tribal lands (Sec. 3). Excavation or removal of any such items also must be done under procedures required by the Archaeological Resources Protection Act (Sec. 3 (c)(1)).

3.18.3.2 State

California Public Resources Code Sections 5020-5029

As discussed in Section 3.3 – Cultural Resources, the California Public Resources Code (PCR) Sections 5020-5029 (inclusive) provide the regulatory framework for State agencies regarding the inventory, evaluation and protection of historical properties and resources of significance. The Code states:

> "*No state agency shall alter the original or significant historical features or fabric, or transfer, relocate, or demolish historical resources on the master list maintained pursuant to subdivision (d) of Section 5024 without, early in the planning process, first giving notice and a summary of the proposed action to the State Historic Preservation Officer (SHPO) who shall have 30 days after receipt of the notice and summary for review and comment."* (Public Resources Code § 5024.5a)

Resources listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) are resources that are required to be given consideration in the CEQA process. A resource listed in, or eligible for listing in, the CRHR is presumed to be historically or culturally significant: this includes listed archaeological resources. The CRHR is an authoritative guide to the State's historical resources, and listed properties are considered significant for purposes of CEQA. The CRHR includes resources listed in or formally determined eligible for listing in the National Register of Historic Places (NRHP), as well as some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts), or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA, unless a preponderance of evidence indicates otherwise (Pub. Resources Code § 5024.1, 21084.1, 14 CCR § 15064.5).

However, a resource does not need to have been identified previously either through listing or survey, to be considered significant under CEQA. In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources (Pub. Resources § 21084.1, 14 CCR § 15064.5(3)). Generally, a resource will be considered by the lead agency to be "historically significant" if it meets the criteria for listing on the CRHR (Pub. Resources Code § 5024.1, Title 14 CCR 4852) including the following:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

Historic resources eligible for listing in the CRHR must meet one of the criteria of significance described above and, like the NRHP, must retain enough of their historic character to be recognizable and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility. Alterations over time to a resource or historic changes in its use may themselves have historical, cultural, or architectural significance. It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the NRHP, but they may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR, if it maintains the potential to yield significant scientific or historical information or specific data.

California Health and Safety Code Section 7050.5 (b) – Human Remains

As discussed in Section 3.3 – Cultural Resources, in accordance with California Health and Safety Code Section 7050.5 (b), if human remains are discovered during ground disturbing activities, the County Coroner must be notified. Section 7050.5 (b) states that "*there shall be no further excavation or disturbance of the site or any nearby area reasonably expected to overlie adjacent remains*" until the coroner has made certain determinations as required by California Government Code, commencing with Section 27460. Health and Safety Code Section 7050.5 (c) states: "*If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC).*"

Upon notification by the coroner, the NAHC must comply with Public Resources Code § 5097.98:

(a) Whenever the commission receives notification of a discovery of Native American human remains from the county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code:

1. *It shall immediately notify those persons it believes to be most likely descended from the deceased Native American.*
2. *The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend… means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48-hours of being granted access to the site.*

(b) Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section, with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner

shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

Public Resources Code Sections 21074, 5024.1 – AB 52

On September 25, 2014 Governor Brown signed Assembly Bill No. 52 (AB 52), which among other things, created a new category of environmental resources, specifically TCRs, which must be considered under CEQA. The law went into effect on July 1, 2015. AB 52 created new requirements for consultation with tribal governments regarding projects that may affect TCRs. As discussed in Section 3.18.2 above, AB 52 includes a definition of TCRs, a tribal consultation process and identification of mitigation measures as agreed upon with tribal representatives.

Under AB 52, California tribes have the ability to establish, through a formal notice letter, a standing request to consult with a Lead Agency regarding any proposed project subject to CEQA in the geographic area with which the tribe is traditionally and culturally affiliated. Upon receiving a request letter from a tribe, an agency may first contact the NAHC to verify that the requesting group is a California Native American tribe and that the agency potentially has lead decision-making authority over a project(s) in that tribe's area of traditional and cultural affiliation (PRC § 21080.3.1(c)). Once this has been verified, the Lead Agency would then add the tribe to the agency's notice list and make sure that all staff are aware of the agency's AB 52 notice and consultation obligations to that tribe regarding CEQA projects for which the agency serves a lead that have potential cultural resource impacts.

California law defines consultation as the "meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and, where feasible, seeking agreement" (Gov. Code § 65352.4). AB 52 also allows for the possibility of project applicant participation in the consultation process, but agencies should not view this as an opportunity to delegate their consultation duties to the applicant (PRC § 21080.3.2(d)). AB 52 requires Lead Agencies to remain fully responsible for the consultation process.

A Lead Agency must provide written notification to requesting tribes on its notice list within 14 days of a decision to undertake a project or a determination that a project application is complete. Notice to the tribes must include a brief project description, the project location, and the lead agency's contact information. A tribe then has 30 days to request consultation. If the tribe does not respond in that period or writes to decline consultation, the lead agency has no further obligation. If the tribe requests consultation, the lead agency must begin the consultation within 30 days and prior to the release of a CEQA document for that proposed project (PRC § 21080.3.1). This timeline allows the agency to consider the information it receives during consultation in determining the proposed project's impacts and the appropriate level of CEQA review.

Senate Bill (SB) 18

Similar to AB 52 described above, SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of

a general plan or a specific plan, or the designation of open space (Gov. Code §65352.3). If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space, it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. Consultation should be concluded at the point in which: (a) The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or (b) Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005)).

3.18.3.3 Local

Tulare County General Plan – 2030 Update

As discussed previously in Section 3.3 – Cultural Resources, the Tulare County General Plan (Tulare County, 2012) includes goals and policies directed toward protecting TCRs in the County. Policies found in the Planning Framework (Section 2) and Environmental Resources Management (Section 8) sections seek to preserve the tribal cultural and archeological resources located in the County through consultation and coordination with affected tribal entities. Select goals and policies relevant to this analysis are listed below.

Section 2.6 – Coordination and Cooperation

Goal PF-6: To work with agencies, districts, utilities, and Native American tribes to promote consistency with the County's General Plan.

Policy PF-6.1 – Plans for Jurisdictions, Agencies, District, Utilities, and Native American Tribes: The County shall work with Tulare County cities; adjacent counties and cities; Federal, State, and regional agencies; local districts; utility providers; Native American tribes; and the military to ensure that their plans are consistent with Tulare County's General Plan to the greatest extent possible.

Policy PF-6.2 – Intergovernmental Coordination: The County shall work with Federal, State, and regional agencies; local districts; utility providers; Native American tribes; and the military to ensure that the County and the public are involved, as appropriate, throughout any planning process and that agency and public input is requested.

Goal ERM-6 – Evaluation of Cultural and Archaeological Resources: The County shall participate in and support efforts to identify its significant cultural and archaeological resources using appropriate State and Federal standards.

Policy ERM-6.2 – Protection of Resources with Potential State or Federal Designations: The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National

Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of Statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.

Policy ERM-6.3 – Alteration of Sites with Identified Cultural Resources: When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and mitigation measures proposed for any impacts the development may have on the resource.

Policy ERM-6.4 – Mitigation: If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.

Policy ERM-6.5 – Cultural Resources Education Programs: The County should support local, State, and national education programs on cultural and archaeological resources.

Policy ERM-6.6 – Historic Structures and Sites: The County shall support public and private efforts to preserve, rehabilitate, and continue the use of historic structures, sites, and parks. Where applicable, preservation efforts shall conform to the current Secretary of the Interior's Standards for the Treatment of Historic Properties and Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.

Policy ERM-6.7 – Cooperation of Property Owners: The County should encourage the cooperation of property owners to treat cultural resources as assets rather than liabilities, and encourage public support for the preservation of these resources.

Policy ERM-6.8 – Solicit Input from Local Native Americans: The County shall continue to solicit input from the local Native American communities in cases where development may result in disturbance to sites containing evidence of Native American activity and/or to sites of cultural importance.

Policy ERM-6.9 – Confidentiality of Archaeological Sites: The County shall, within its power, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

Policy ERM-6.10 – Grading Cultural Resources Sites: The County shall ensure all grading activities conform to the County's Grading Ordinance and California Code of Regulations, Title 20, § 2501 et. seq.

Tulare County Code

The Tulare County Code does not contain any regulations or requirements specific to TCRs.

3.18.4 Significance Thresholds

3.18.4.1 Appendix G Thresholds from the State CEQA Guidelines

Appendix G of the State CEQA Guidelines provides thresholds of significance for determining whether a project could have a significant effect on the environment. According to Appendix G, a project could have a potentially significant impact on TCRs if the project would:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.18.4.2 Additional Thresholds of Significance

Requirements identified in the County policies and plans are addressed by the CEQA Appendix G significance criteria above. There are no additional thresholds of significance related to the topical environmental issue.

3.18.5 Methodology of Analysis

This analysis is based on the review of applicable Federal, State and local requirements, Project design features, BMP's, operating practices, previously identified mitigation measures identified in this DEIR and other environmental protection measures that have been incorporated into the Project to minimize potential impacts on the environment.

Impacts to TCRs are assessed based on the potential for a project to adversely affect existing known and unknown cultural and archaeological resources. This requires an analysis of whether there are significant TCRs that could be affected by the Project that would result in a substantial adverse change (i.e., physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings) in the significance of a resource. This also requires consultation with local tribes who have a historical connection to the Project area to determine if development of the site would potentially impact resources of tribal significance. The significance of TCRs is defined in Section 3.18.6.

Æ prepared the Cultural Resource Investigation, presented in Appendix E, based on accepted professional practices and standards in the fields of cultural and archaeology history. The Cultural Resource Investigation was completed under the provisions of CEQA, the Public Resources Code (PRC) Chapter 2.6,

Section 21083.2, and California Code of Regulations (CCR) Title 14, Chapter 3, Article 5, Section 15064.5. While the Cultural Resource Investigation does not directly address tribal consultation and outreach program under AB 52, relevant results of Æ's site survey and records search are included in this section.

In accordance AB 52, and in coordination with the County, TID conducted tribal consultation and outreach with the potentially affected tribes with historical ties to the Project area. Refer to Section 3.18.5.5 below.

3.18.5.3 Records Search

As previously discussed in Section 3.3 – Cultural Resources, Æ requested records searches from the California Historical Resources Information System Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield in October 2013 and November 16, 2020. These searches encompassed all land within a 0.5-mile radius of the Project area. Sources consulted included archaeological site and survey base maps, reports of previous investigations, cultural resource records, the listings of the National Register of Historic Places, the Historic Property Data File (3/18/2013), the California Historical Landmarks, the California Register of Historical Resources, the California Inventory of Historic Resources, the California Points of Historical Interest, and the Built Environment Resources Directory (see Appendix E).

Æ's record search revealed one (1) prehistoric habitation site located across the Kaweah River (P-54-000316). The site record describes P-54-000316 as a "village site" but provides no information regarding the site constituents. Documentation of the records searches is included in Appendix E. The records search did not identify any formally recorded TCRs of tribal significance within the Project area.

Tribal Cultural Resources

Æ contacted the NAHC requesting a Sacred Lands File search and Native American contacts list. On October 2, 2013, the NAHC responded to Æ's request and stated that the Sacred Lands File did not indicate the presence of sacred sites in the Project area. The NAHC provided Æ with a list of individuals and organizations to be contacted regarding information on Native American cultural resources in the Project area. Æ sent a letter soliciting concerns about the Project to the each of the individuals and tribes on October 2, 2013. Follow-up phone calls were made and emails sent on October 14, 2013. No further outreach was undertaken in 2020. The TID, in coordination with the County, are responsible for government-to-government Native American consultation pursuant to CEQA and AB 52.

In 2013, Æ received responses from two of the seven individuals contacted. The responses received in 2013 are summarized in Table 3.18-1 below. A copy of Æ's Native American outreach log is provided in Appendix E.

Table 3.18-1. Excerpt from the Native American Outreach Log

Individual / Organization	Contact	Comments	Date Received
Santa Rosa Rancheria Tachi Yokut Tribe	Shana Brum	Shana Brum stated that the Project is in a highly sensitive area and requested an on-site meeting and Native American monitoring during ground-disturbing activities. Brum further recommended that the Project proponent contact the Wukchumni Tribe.	10/7/13
Wuksache Tribe	Johnny Sartuche	Johnny Sartuche stated that the Project area is sensitive for cultural resources and requested that he be notified of any resources identified. He further recommended that the Project not proceed due to the sensitivity of the area.	10/14/13

3.18.5.4 Field Surveys

As discussed in Section 3.3 – Cultural Resources and above, Æ conducted an intensive-level cultural resources field survey of the Project site on October 7 and 11, 2013, and subsequently on January 12, 2021. The pedestrian cultural resources site surveys were intended to locate and document previously recorded or new cultural resources, including TCRs. Please see Appendix E for more details regarding Æ's field surveys and related methodology.

During the cultural resource pedestrian surveys, Æ archaeologists examined the Project site for TCRs (e.g., flaked stone tools, tool-making debris, stone milling tools, fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions, and features indicative of the former presence of structures or buildings (e.g., postholes, foundations) or historic debris (e.g., metal, glass, ceramics). Æ did not identify any TCRs during the field surveys of the Project site.

3.18.5.5 Tribal Consultation PRC Section 21074 – AB 52

As the Lead Agency under CEQA and in compliance with PRC 21074 – AB 52, TID is responsible for contacting the California Native American tribes in the vicinity of a proposed project. TID also worked closely with the County to complete appropriate tribal consultation pursuant to AB 52. If a tribe requests formal consultation regarding the proposed project, the lead agency shall proceed with consultation per the requirements of PRC 21074 – AB 52. In accordance with both AB 52 and SB 18, in September 2021 TID contacted the NAHC and various California Native American tribes that the County and the NAHC indicated are traditionally and culturally affiliated with the geographic area of the Project. Of the seven tribal entities notified about the Project by TID, one response was received; a voicemail from the Dunlap Band of Mono Indians, indicated that their tribal organization had no further comments nor would they request further consultation. In addition to these specific tribes, an informational response letter was also received from the NAHC.

In accordance PRC Section 21074 – AB 52, the TID contacted the following tribes, summarized in Table 3.18-2 below, to obtain their input and concern with potential impacts to TCR as a result of the Project.

As discussed in Section 3.18.6.2 below, to date TID has only received one formal response from the tribes contacted under PRC Section 21074 – AB 52, specifically from the Dunlap Band of Mono Indians indicating they had no comments and would not request further consultation on the Project.

Table 3.18-2. Tribes Consulted (PRC Section 21074 – AB 52)

Date Notified	Tribe	Status/Response
9/16/2021	Big Sandy Rancheria of Western Mono Indians	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/20/2021. No response or request for further consultation was received from this tribal entity.
9/16/2021	Kern Valley Indian Community – Kawaiisu Tubatulabal	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/24/2021. No response or request for further consultation was received from this tribal entity.
9/16/2021	Dunlap Band of Mono Indians	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/17/2021. Dirk Charlie of the Dunlap Band of Mono Indians contacted TID via phone/voicemail and indicated that tribe had no comments on the proposed Project, nor would they request further consultation.
9/16/2021	Santa Rosa Rancheria Tachi Yokut Tribe	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/20/2021. No response or request for further consultation was received from this tribal entity.
9/16/2021	Tubatulabals of Kern Valley	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 10/4/2021. No response or request for further consultation was received from this tribal entity.
9/16/2021	Tule River Indian Tribe	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/21/2021. No response or request for further consultation was received from this tribal entity.
9/16/2021	Wuksache Indian Tribe/Eshom Valley Band	Formal notification was sent by certified mail on 9/16/2021, and TID received a mailing receipt/delivery confirmation on 9/20/2021. No response or request for further consultation was received from this tribal entity.

3.18.5.6 Human Remains

During the field surveys, Æ also looked for any evidence of human remains and none were identified.

3.18.5.7 Project Design Features, BMPs and Environmental Protection and Minimization Measures

As discussed in Section 2.4.13, numerous design features, BMPs, operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental protective measures that were considered during this evaluation include, but are not limited to, the following:

- Employee training programs will be conducted to educate personnel of sensitivity issues including but not limited to cultural resources.
- Blasting would not be used for the mining operations.

3.18.6 Project-Level Impacts and Mitigation Measures

3.18.6.1 Issues Found to Have No Impact

All identified thresholds and potential effects were evaluated as described in Section 3.18.6.2 below.

3.18.6.2 Tribal Cultural Resources

Impact Statement

Impact TCR-1: *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

i. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

ii. Would the Project cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe? ***(CEQA Guidelines Threshold Criteria (a))***

Impact Analysis

As discussed above, during the field survey Æ carefully inspected the Project site for TCRs and none were identified. While the Æ study/cultural surveys have not indicated sensitivity for TCRs within the Project site, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface during previous surveys.

In accordance PRC Section 21074 – AB 52, TID in coordination with the County contacted seven tribes, summarized in Table 3.18-2 above, to obtain their input and concern with potential impacts to TCR as a result of the Project. As discussed above, of the seven tribes contacted, only the one tribe responded,

specifically Dirk Charlie with the Dunlap Band of Mono Indians, contacted TID via phone/voicemail and indicated that the Dunlap Band of Mono Indians did not have any comments on the Project as proposed, and would not require further tribal consultation. To date, no other responses or input has been received from the other tribes consulted through PRC Section 21074 – AB 52. As such, the Project impacts to TCRs would be less than significant, with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.18.7 Cumulative-Level Impacts and Mitigation Measures

The geographical context for the analysis of potentially cumulative impacts to TCRs is the geographical area where the Project is located and includes the County of Tulare, as well as the nearby City of Woodlake.

The destruction and/or loss of such resources could be cumulatively significant if not collectively addressed by individual projects. All the cumulative projects are required to comply with local, State, and Federal regulations and policies, including PRC section 21074 – AB 52. The County General Plan includes policies requiring the identification and mitigation of tribal cultural and archeological resources on a project-by-project basis as a means of protecting those resources countywide. Therefore, overall cumulative impacts associated with TCRs are considered less than significant.

Additionally, the Project design features, BMPs and mitigation measures would prevent impacts to tribal cultural and archeological resources from becoming significant at the project level. Therefore, the Project's contribution would also be cumulatively less than considerable. No additional mitigation measures are necessary. For these reasons, the Project would not contribute to cumulatively significant impacts related to TCRs.

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3.19 UTILITIES AND SERVICE SYSTEMS

3.19.1 Introduction

This section of the DEIR presents a discussion of utilities and service systems. A review of potential Project impacts is provided in the following analysis.

3.19.2 Environmental Setting

3.19.2.1 Regional and Local Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map in Section 2.0 – Project Description). Figures in Section 2.0 – Project Description illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are primarily used for agricultural and, to a limited extent, for rural residential purposes.

Most of the Project site is vegetated with non-native grasses except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs. The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. The Project site topography is relatively level with a depression in the southeast corner. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The Project site elevation decreases from approximately 472-feet above mean sea level (amsl) on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end.

Because of the existence of high-quality aggregate in the alluvial soils in the area of the Project site there are also aggregate mining operations and processing facilities adjacent to the Project and throughout the immediate area.

3.19.3 Regulatory Setting

The Project is subject to a variety of land use regulatory requirements and designations, which are discussed fully in the sections to follow.

3.19.3.1 Federal

There are no federal utility or service system regulations that directly affect the Project.

3.19.3.2 State

State Water Quality Control Board

The State Water Resources Control Board (State Water Board) was created by the Legislature in 1967. The joint authority of water allocation and water quality protection enables the State Water Board to provide comprehensive protection for California's waters. The State Water Board consists of five full-time salaried members, each filling a different specialty position. Board members are appointed to four-year terms by the Governor and confirmed by the Senate. The task of protecting and enforcing the many uses of water, including the needs of industry, agriculture, municipal districts, and the environment is an ongoing challenge for the State and Regional Water Quality Control Boards.

Regional Water Quality Control Board (RWQCB)

There are nine Regional Water Quality Control Boards (Regional Boards). The mission of the Regional Boards is to develop and enforce water quality objectives and implementation plans that will best protect the State's waters, recognizing local differences in climate, topography, geology and hydrology. Each Regional Board has seven part-time members appointed by the Governor and confirmed by the Senate. Regional Boards develop "basin plans" for their hydrologic areas, issue waste discharge requirements, take enforcement action against violators, and monitor water quality. The task of protecting and enforcing the many uses of water, including the needs of industry, agriculture, municipal districts, and the environment is an ongoing challenge for the State and Regional Water Quality Control Boards.

State NPDES General Construction Permit

The State National Pollutant Discharge Elimination System (NPDES) General Construction Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that uses storm water "Best Management Practices" to control runoff, erosion and sedimentation from the site both during and after construction. The SWPPP has two major objectives: (1) to help identify the sources of sediments and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of practices to reduce sediment and other pollutants in storm water discharges.

3.19.3.3 Local

County of Tulare Solid Waste Services

Tulare County operates two active landfills: Visalia and Teapot Dome. The Visalia landfill has enough capacity to provide at least 140 years (2014-2154) of disposal capacity (Scott Pfanstiel, Solid Waste Department; retired).

Assembly Bill 939 (AB 939) requires cities and counties to reduce their solid waste volumes by 25 percent by 1995 and 50 percent by the year 2000. To achieve this reduction in volume, AB 939 requires local entities to devise a materials recovery facility by composting organic materials; recycling paper, metal, glass, and plastic; and by diverting household hazardous waste to the Kettlemen Hills waste facility.

Tulare County General Plan

The Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)", with a General Plan designation of "Valley Agriculture". The Project is also located within a designated Mineral Resource Area (MRZ-2b) as determined by the California Department of Conservation (Department of Conservation, 1997) and referenced in County General Plan (Tulare County, 2012).

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan utility and service system policies that potentially relate to the proposed Project in this resource are listed as follows.

- ***PFS-2.1 Water Supply:*** *The County shall work with agencies providing water service to ensure that there is an adequate quantity and quality of water for all uses, including water for fire protection, by, at a minimum, requiring a demonstration by the agency providing water service of sufficient and reliable water supplies and water management measures for proposed urban development.*
- ***PFS-2.2 Adequate Systems:*** *The County shall review new development proposals to ensure that the intensity and timing of growth will be consistent with the availability of adequate production and delivery systems. Projects must provide evidence of adequate system capacity prior to approval.*
- ***PFS-2.3 Well Testing:*** *The County shall require new development that includes the use of water wells to be accompanied by evidence that the site can produce the required volume of water without impacting the ability of existing wells to meet their needs.*
- ***PFS-2.4 Water Connections:*** *The County shall require all new development in UDBs, UABs, Community Plans, Hamlet Plans, Planned Communities, Corridor Areas, Area Plans, existing water district service areas, or zones of benefit, to connect to the community water system, where such system exists. The County may grant exceptions in extraordinary circumstances, but in these cases, the new development shall be required to connect to the water system when service becomes readily available.*
- ***PFS-2.5 New Systems or Individual Wells:*** *Where connection to a community water system is not feasible per PFS-2.4: Water Connections, service by individual wells or new community systems may be allowed if the water source meets standards for quality and quantity.*
- ***PFS-3.1 Private Sewage Disposal Standards:*** *The County shall maintain adequate standards for private sewage disposal systems (e.g., septic tanks) to protect water quality and public health.*
- ***PFS-3.2 Adequate Capacity:*** *The County shall require development proposals to ensure the intensity and timing of growth is consistent with the availability of adequate wastewater treatment and disposal capacity.*
- ***PFS-3.3 New Development Requirements:*** *The County shall require all new development, within UDBs, UABs, Community Plans, Hamlet Plans, Planned Communities, Corridor Areas, Area Plans, existing wastewater district service areas, or zones of benefit, to connect to the wastewater*

system, where such systems exist. The County may grant exceptions in Tulare County General Plan. The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project in this resource are listed as follows.

- ***PFS-2.1 Water Supply:*** *The County shall work with agencies providing water service to ensure that there is an adequate quantity and quality of water for all uses, including water for fire protection, by, at a minimum, requiring a demonstration by the agency providing water service of sufficient and reliable water supplies and water management measures for proposed urban development.*
- ***PFS-2.2 Adequate Systems:*** *The County shall review new development proposals to ensure that the intensity and timing of growth will be consistent with the availability of adequate production and delivery systems. Projects must provide evidence of adequate system capacity prior to approval.*
- ***PFS-2.3 Well Testing:*** *The County shall require new development that includes the use of water wells to be accompanied by evidence that the site can produce the required volume of water without impacting the ability of existing wells to meet their needs.*
- ***PFS-2.4 Water Connections:*** *The County shall require all new development in UDBs, UABs, Community Plans, Hamlet Plans, Planned Communities, Corridor Areas, Area Plans, existing water district service areas, or zones of benefit, to connect to the community water system, where such system exists. The County may grant exceptions in extraordinary circumstances, but in these cases, the new development shall be required to connect to the water system when service becomes readily available.*
- ***PFS-2.5 New Systems or Individual Wells:*** *Where connection to a community water system is not feasible per PFS-2.4: Water Connections, service by individual wells or new community systems may be allowed if the water source meets standards for quality and quantity.*
- ***PFS-3.1 Private Sewage Disposal Standards:*** *The County shall maintain adequate standards for private sewage disposal systems (e.g., septic tanks) to protect water quality and public health.*
- ***PFS-3.2 Adequate Capacity:*** *The County shall require development proposals to ensure the intensity and timing of growth is consistent with the availability of adequate wastewater treatment and disposal capacity.*
- ***PFS-3.3 New Development Requirements:*** *The County shall require all new development, within UDBs, UABs, Community Plans, Hamlet Plans, Planned Communities, Corridor Areas, Area Plans, existing wastewater district service areas, or zones of benefit, to connect to the wastewater system, where such systems exist. The County may grant exceptions in control non-point source water pollution contained in the U.S. Environmental Protection Agency National Pollution Discharge Elimination System (NPDES) program.*
- ***PFS-5.1 Land Use Compatibility with Solid Waste Facilities:*** *The County shall ensure that solid waste facility sites (for example, landfills) are protected from the encroachment by sensitive and/or incompatible land uses.*

- ***PFS-5.3 Solid Waste Reduction:*** *The County shall promote the maximum feasible use of solid waste reduction, recycling, and composting of waste, strive to reduce commercial and industrial waste on an annual basis, and pursue financing mechanisms for solid waste reduction programs.*
- ***PFS-5.4 County Usage of Recycled Materials and Products:*** *The County shall encourage all industries and government agencies in the County to use recycled materials and products where economically feasible.*
- ***PFS-5.8 Hazardous Waste Disposal Capabilities:*** *The County shall require the proper disposal and recycling of hazardous materials in accordance with the County's Hazardous Waste Management Plan.*
- ***PFS-5.9 Agricultural Waste:*** *The County shall investigate waste disposal and reuse needs for agricultural wastes for energy and other beneficial uses and shall change County plans accordingly.*

3.19.4 Significance Thresholds

Under the Appendix G of the CEQA Guidelines category of "Utilities and Service Systems" a project is considered to have a significant impact on the environment if it would:

a) *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects (CEQA Appendix G Threshold (a))?*

b) *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years (CEQA Appendix G Threshold (b))?*

c) *Result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments (CEQA Appendix G Threshold (c))?*

d) *Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructures, or otherwise impair the attainment of solid waste reduction goals (CEQA Appendix G Threshold (d))?*

e) *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste (CEQA Appendix G Threshold (e))?*

3.19.5 Methodology of Analysis

The following points were considered in the Utilities and Service Systems evaluation:

- The Project would create a water storage reservoir, which would allow for the enhanced management of surface water supplies by increasing the long-term availability of irrigation supplies, and groundwater recharge supplies.
- The land underlying the Project is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a General Plan designation of Valley Agriculture. The Project site is also located within a

designated MRZ-2b zone, as determined by the California Department of Conservation and referenced in the County General Plan.

- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.

3.19.6 Project-Level Impacts and Mitigation Measures

3.19.6.1 Relocation or Construction of New/Expanded Utilities

Impact Statement

Impact UTL-1: *Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?* **(CEQA Guidelines – Appendix G Threshold Criteria (a))**

Impact Analysis

Because the production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. The Project would not result in an increase of onsite employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. Other than a small/temporary extension of an existing Southern California Edison (SCE) electrical connection to accommodate the onsite processing equipment during the reservoir construction phase, the Project would not require the relocation or construction of new or expanded electric power or telecommunication facilities. The Project would not generate significant amount of waste that would exceed the capacity of the local landfills. Portable toilet facilities would be provided at the site and waste disposed of at an approved facility. The Project would not rely on existing storm water drainage systems, nor would it require the construction of new or expanded storm water drainage systems. As discussed in Section 3.7 – Hydrology and Water Quality, the Project would have sufficient water supplies available to use for dust suppression during excavation, construction and operations.

Therefore, the Project would have no impact on utilities and services systems.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.19.6.2 Sufficient Water Supplies

Impact Statement

Impact UTL-2: *Would the Project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?* **(CEQA Guidelines – Appendix G Threshold Criteria (b))**

Impact Analysis

As discussed above, because the production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. The Project would not result in an increase of onsite employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. As discussed in Section 3.7 – Hydrology and Water Quality, the Project would have sufficient water supplies available to use for dust suppression during excavation, construction and operations.

Therefore, the Project would have no impact on utilities and services systems.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.19.6.3 Wastewater Treatment

Impact Statement

Impact UTL-3: *Would the Project result in a determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?* **(CEQA Guidelines – Appendix G Threshold Criteria (c))**

Impact Analysis

As discussed above, because the production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. Portable toilet facilities would be provided at the site and waste disposed of at an approved facility.

Therefore, the Project would have no impact on utilities and services systems.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.19.6.4 Solid Waste

Impact Statement

Impact UTL-4: *Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructures, or otherwise impair the attainment of solid waste reduction goals?* **(CEQA Guidelines – Appendix G Threshold Criteria (d))**

Impact Analysis

As discussed above, because the materials extraction and the processing/production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. The Project would not result in an increase of onsite employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. The Project would not generate significant amounts of waste

that would exceed the capacity of the local landfills. Portable toilet facilities would be provided at the site and waste disposed of at an approved facility. The Project would not rely on existing storm water drainage systems, nor would it require the construction of new or expanded storm water drainage systems.

Therefore, the Project would have no impact on utilities and services systems.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.19.6.5 Management, Reduction Statutes, and Regulations Related to Solid Waste

Impact Statement

Impact UTL-5: *Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?* **(CEQA Guidelines – Appendix G Threshold Criteria (e))**

Impact Analysis

As discussed above, because the production rate of aggregate would not increase from baseline, the requirements for services such as utilities would not significantly change during reservoir excavation, and the subsequent construction phase would require less utilities than the excavation phase. The reservoir operation would be manned remotely from the TID office and would not result in a change in the TID office utility and service system requirements. The Project would not result in an increase of onsite employees, a change in the number of on-road haul trucks or the energy consumption from the baseline conditions. The Project would not generate significant amount of waste that would exceed the capacity of the local landfills. Portable toilet facilities would be provided at the site and waste disposed of at an approved facility. The Project would not rely on existing storm water drainage systems, nor would it require the construction of new or expanded storm water drainage systems.

Therefore, the Project would have no impact on utilities and services systems.

Level of Significance before Mitigation

No Impact.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.19.7 Cumulative-Level Impacts and Mitigation Measures

Cumulative impacts are determined to be considerable if the incremental effects of an individual project are considerable when viewed in connection with the effects of past, present, and reasonably foreseeable probable future projects within the vicinity of the proposed project (CEQA Guidelines Section 15065(a)(3). A list of proposed projects that are considered reasonably foreseeable and located in the general vicinity of the Project was obtained from the Tulare County Resource Management Agency (RMA) and City of Woodlake's respective websites. In addition, the cumulative impacts associated with the existing and/or approved mining projects in the immediate vicinity of the Project have been included in the cumulative analysis. The cumulative projects are listed in Table 3-1 – Cumulative Projects List and their location provided in Figure 3.0-1.

The majority of the cumulative projects within the County and City of Woodlake are located some distance from the Project and involve activities that are not similar to the Project such as minor divisions of land, rezoning, or amendments to the General Plan. Therefore, these projects are not considered to have a potential cumulative impact related to land use and planning.

As discussed in Section 3.8 – Land Use and Planning, the Project was determined to be consistent with the County General Plan and Zoning designations for the Project site, and with the County's General Plan policies. The Project impacts are less than significant. Therefore, the Projects contribution to potential cumulative impacts would not be considerable, and there would be no significant cumulative impacts related to utilities and service systems.

3.20 WILDFIRE

3.20.1 Introduction

This section of the DEIR describes the local and regional wildfire conditions that occur in the vicinity of and at the Project site. Potential resources and impacts related to wildfire are identified within the Project area, the potential effects that the Project may have on these resources and/or wildfire risks are discussed, and mitigation measures to address potentially significant impacts are identified.

3.20.2 Environmental Setting

3.20.2.1 Regional Setting

The Project site is located in a semi-rural area of unincorporated Tulare County, near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Project site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek, before draining into the Tulare Lake bottom near Corcoran.

The *Foothill Growth Management Plan Element* of the *Tulare County General Plan* (Tulare County, 2012) describes the area climate as typical of the foothill region, with cool rainy winters having a mean daily temperature ranging from 40° to 50° Fahrenheit (F) and hot dry summers where daytime temperatures can exceed 100° F.

During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the foothills. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and ranges from approximately 10 inches at the base to 25 inches at 3,000-feet. Most of this precipitation occurs between the months of November and April.

During daytime there is a dominant southeasterly wind flow pattern towards the Tehachapi Mountains. At night, this flow is reversed by winds that flow from the Sierra mountains and foothill canyons.

Biological resources in the region have been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley oak and interior live oak on higher ground. Herbaceous wetland bottoms and upland native grassland communities were common in this vegetation mosaic. The extensive oak forests and riparian/wetland habitats hosted a diverse and abundant wildlife community. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation.

Currently in the foothills, the vegetation ranges from annual grasses in open areas to dense shrubs and trees. Much of the native vegetation in the area has been replaced by introduced species or has been

eliminated by cultivation and overgrazing. Agriculture is currently the main land use in the region, although narrow strips of riparian vegetation grow along remnant tributaries.

3.20.2.2 Vicinity Setting

Surrounding land uses adjacent to the Project site include aggregate mining and auxiliary facilities, as well as open space/agricultural land and scattered rural residences. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility has been operating immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 miles to the southwest of the Project site (Figure 2-2 – Project Site and Surrounding Land Use Map).

The Project is located in unincorporated Tulare County, 1.0 miles northwest of the community of Lemon Cove and 2.5 miles southeast of the community of Woodlake (Figure 1-1 – Location Map). The Owners propose to construct and operate the Project on the north side of the divergence of the Lower Kaweah River and St. Johns River (North Parcel) adjacent to and downstream of McKay Point (Figure 2-2 – Project Site and Surrounding Land Use). The area around the Project site has historically been used for agriculture, cattle grazing and aggregate mining. The Project site itself has primarily been used for cattle grazing under lease agreement.

3.20.2.3 Project Site Setting

The majority of the Project site is vegetated with non-native grasses except for a small portion of ground adjacent to the Kaweah River above McKay Point, which is vegetated by oak woodlands trees and shrubs. The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Grasses and small trees are present and these increase in density with proximity to the nearby rivers. In addition, some of these existing plant communities are dry and stressed due to years of drought conditions, creating an area that contains tinder and kindling making it potentially prone to wildfires.

The Project site topography is relatively level with a depression in the southeast corner. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The Project site elevation decreases from approximately 472-feet above mean sea level (amsl) on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end. Figure 2-2 and 2-4 in Section 2.0 – Project Description show the vicinity setting and layout of the proposed Project.

The California Department of Forestry and Fire Protection (CalFire) publishes Fire Hazard Severity Zones (FHSZ) maps which designated areas of the state determined to pose a significant wildfire hazard risk based on fuel availability, terrain, weather and other relevant factors (https://calfire.ca.gov). CalFire's FHSZ maps for Tulare County were reviewed, and the Project site is not located in a State Responsibility Area (SRA) or a designated Very High Fire Hazard Severity Zone (VHFHSZ)" area. However, a designated SRA "High FHSZ" is located approximately 0.6 miles north/northeast of the Project site

(https://osfm.fire.ca.gov/media/6830/fhszs_map54.pdf). Additionally, the southern portion of the Project is located within a Local Responsibility Area (LRA), specifically a designated LRA "Moderate FHSZ" as designated by CalFire. There are no high-voltage power lines located on or near the Project site.

3.20.3 Regulatory Setting

3.20.3.1 Federal

There are no federal regulations applicable to the Project with regard to wildfire hazards.

3.20.3.2 State

Senate Bill 1241

California's increasing population and the expansion of development into previously undeveloped areas has created more "wildland-urban interface" issues with a corresponding increased risk of loss to human life, natural resources and economic assets associated with wildland fires. Additionally, the changing climate, specifically rising temperatures and increasing temporal variability of water availability has substantially increased wildfire risk in many areas around the State. To address these State-wide concerns, Senate Bill (SB) 1241 (Kehoe, 2012) was passed in September 2013 which required the Office of Planning and Research (OPR), the Natural Resource Agency, and CalFire to develop "*amendments to the initial study checklist of the [CEQA Guidelines] for the inclusion of questions related to fire hazard impacts for projects located on lands classified as state responsibility areas (SRAs), as defined in Section 4102, and on lands classified as very high fire hazard severity zones (VHFHSZ), as defined in Subdivision (i) of Section 51177 of the Government Code.*" (Public Resources Code, § 21083.01).

SB 1241 also requires that the Safety Elements of local general plans be revised, upon the next update to the Housing Element, to address SRAs and VHFHSZs. The revisions must include information about wildfire hazards, as well as goals, policies, and objectives and feasible implementation measures for the protection of the community from the unreasonable risk of wildfire.

California Department of Forestry and Fire Protection

CalFire protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. The Office of the State Fire Marshal supports CalFire's mission by focusing on fire prevention. It provides support through a wide variety of fire safety responsibilities including by regulating buildings in which people live, congregate, or are confined; by controlling substances and products which may, in and of themselves, or by their misuse, cause wildfire related accidents; by providing statewide direction for fire prevention in wildland areas; by regulating hazardous liquid pipelines; by reviewing regulations and building standards; and by providing training and education in fire protection methods and responsibilities.

California Fire Plan

The California Fire Plan is the statewide plan for reducing the risk of wildfire. The plan's basic principles are as follows: involve the community in the fire management planning process; assess public and private resources that could be damaged by wildfire; and develop pre-fire management solutions and implement cooperative programs to reduce the community's potential wildfire losses.

One of the more important objectives of the California Fire Plan pertains to pre-fire management solutions. Included within the scope of pre-management solutions are fuel breaks, the establishment of wildfire protection zones, and prescribed fires to reduce the availability of fire fuels. In addition, the plan recommends that clearance laws, zoning, and related fire safety requirements implemented by State and local authorities address fire-resistant construction standards, hazard reduction near structures, and infrastructure.

The California Fire Plan does not contain any specific requirements or regulations. It acts as an assessment of current fire management practices and standards and recommends methods for how to best improve the practices and standards in place.

California Fire Code

The 2016 California Fire Code (Title 24, Part 9 of the California Code of Regulations) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The Fire Code also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the California Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout California. The California Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire service features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and wildland-urban interface areas. Additionally, The County has adopted various requirements found within the California Fire Code through their current Ordinance Code and implements these standards through its permitting process.

California Public Resources Code

Sections 4201-4204

Public Resources Code (PRC) Sections 4201–4204 and Government Code Sections 51175–51189 direct CalFire to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildland fires. As described in Section 3.11.2.3, the Project site is located near (approximately 0.6 miles away) a State-designated FHSZ.

Section 4290

PRC Section 4290 was adopted to establish minimum wildfire protection standards in conjunction with building, construction, and development in SRAs. Under Section 4290, the future design and construction of structures, subdivisions, and developments in SRAs must provide for basic emergency access and specified perimeter wildfire-protection measures. These measures include road standards for emergency access; signing and building numbering; water supply reserves; and fuel breaks and greenbelts. Local standards that exceed those of PRC Section 4290 supersede the measures presented therein.

Section 4291

PRC Section 4291 applies to a person who owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area; lands covered by forest, brush, or grass; or land that is covered with flammable material. If a structure is located in a SRA, Section 4291 states the owner is responsible for ensuring their property is in compliance with California's building and fire codes that call for homeowners to take proactive steps to protect their property from a wildfire. Section 4291 mandates that those who own homes and business in wildland areas maintaining defensible space of 100-feet from each side of the structure, but not beyond the property line. The amount of fuel modification necessary must also account for the flammability of the structure as affected by building material, building standards, location, and type of vegetation.

3.20.3.3 Local

Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

The intent of Tulare County's 2017 Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) is to assess the natural, technological, and human-caused risks to County communities, and to reduce the potential impact of the hazards by creating mitigation strategies. Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as "*any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.*" FEMA also defines a "hazard" as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss."

The County's 2017 MJLHMP represents the County's commitment to create a safer, more resilient community by taking actions to reduce risk and by committing resources to lessen the effects of hazards on the people and property of the County. The County MJLHMP is a "living document" that is reviewed, monitored, and updated to reflect changing conditions and new information. As required by law, the MJLHMP is updated every five years to remain in compliance with regulations and federal mitigation grant conditions. The current County MLJHMP was approved by the County's Board of Supervisors and subsequently by FEMA in March 2018.

Tulare County Ordinance Code

The Tulare County Ordinance Code contains various provisions related to fire prevention and wildfire abatement. The provisions found in County Code, Chapter 11 (Fire Hazardous Weeds and Rubbish) are

meant to "*protect the lands, fields, lots, buildings and homes within this County from the danger of fire, which may spread from one property to another.*" (Tulare County Code, Part IV, Chapter 11 – Section 4-11-1005). Specifically, the County Code states that "*It is the duty of every owner of private property within the unincorporated areas of Tulare County to prevent a nuisance from arising on, or existing upon, his or her property.*" (Tulare County Code, Part IV, Chapter 11 – Section 4-11-1075), where "nuisance" is defined as "*Weeds, grass, rank growths and combustible rubbish growing or accumulating upon private property which do, or will when dry, create a fire hazard and which by virtue thereof constitute a danger to neighboring property or the health or welfare of residents of the vicinity.*" (Tulare County Code, Part IV, Chapter 11 – Section 4-11-1065).

As discussed in Section 3.11.6 below, certain requirements found in Chapter 11 of the Tulare County Code do not apply to this Project. Chapter 11 and associated General Plan goals and policies are further discussed in Section 3.11.6.

Tulare County Fire Hazard Abatement Program

The Tulare County Fire Department's Hazard Abatement Program outlines specific fire abatement standards for property owners within the designated County LRA areas in the valley and the SRA areas in the foothills. The primary function of the Hazard Abatement Program is to reduce the risk of fires within these areas by proactively establishing defensible space and reducing/removing flammable materials (e.g., weeds, grass, rubbish, etc.) on applicable properties. The County's hazard abatement standards are not a one-time observance, but rather property owners would likely need to have their property addressed more than once during the year in order to meet the standards. Although required throughout the year, it is extremely critical that properties be maintained during the high fire months, usually from April through October. Applicable property owners are required to demonstrate compliance with the Hazard Abatement Program through submittal of online forms on an annual basis. Additionally, County Fire conducts compliance checks throughout the year, and issues corrective actions for those properties that do not meet the applicable hazard abatement standards.

Tulare County General Plan

The Health and Safety element (Chapter 10) of the Tulare County General Plan – 2030 Update (Tulare County, 2012) outlines goals and policies to achieve community protection from risks associated with natural and man-made hazards, including wildfire hazards. The General Plan contains general hazard and risk reduction strategies and policies to minimize potential dangers to residents, workers, and visitors; reduce the level of property loss resulting from potential disasters; and identify ways to respond and evacuate during crisis situations. Relevant General Plan wildfire goals and policies that potentially apply to the proposed Project are listed below.

Section 10.6 – Urban and Wildland Fire Hazards

Goal HS-6: To minimize the exposure of County residents, visitors, and public and private property to the effects of urban and wildland fires.

Policy HS-6.1 – New Building Fire Hazard: The County shall ensure that all building permits in urban areas, as well as areas with potential for wildland fires, are reviewed by the County Fire Chief. The following minimum requirements should be met to review developments or uses within areas of varying fire hazards:

a. Very High Hazard – Extreme caution should be used in allowing development, particularly critical facilities.
b. High Hazard – Strict compliance with existing State statutes and local ordinances should provide adequate fire protection.
c. Moderate Hazard – Development should be allowed, with recommendations for mitigation of hazard by Fire Warden.

Policy HS-6.2 – Development in Fire Hazard Zones: The County shall ensure that development in very high or high fire hazard areas is designed and constructed in a manner that minimizes the risk from fire hazards and meets all applicable State and County fire standards. This shall include promoting the use of fire-resistant materials designed to reduce fire vulnerability within high or very high fire hazard areas through use of Article 86-A of the 2001 California Fire Code, SRA Fire Safe Regulations, and other nationally recognized standards, as may be updated periodically. Special consideration shall be given to the use of fire-resistant-materials and fire-resistant construction in the underside of eaves, balconies, unenclosed roofs and floors, and other similar horizontal surfaces in areas with steep slopes. Ensure new development proposals contain specific fire protection plans, actions, and codes for fire engineering features for structures in Very High Fire Hazard Safety Zones including automatic sprinklers as required by applicable codes.

Policy HS-6.3 – Consultation with Fire Service Districts: The County shall consult the appropriate fire service district in areas identified as subject to high and very high fire hazard, for particular regulations or design requirements prior to issuance of a building permit or approval of subdivisions.

Policy HS-6.5 – Fire Risk Recommendations: The County shall encourage the County Fire Chief to make recommendations to property owners regarding hazards associated with the use of materials, types of structures, location of structures and subdivisions, road widths, location of fire hydrants, water supply, and other important considerations regarding fire hazard that may be technically feasible but not included in present ordinances or policies.

Policy HS-6.6 – Wildland Fire Management Plans: The County shall require the development of wildland fire management plans for projects adjoining significant areas of open space that may have high fuel loads.

Policy HS-6.7 – Water Supply System: The County shall require that water supply systems be adequate to serve the size and configuration of land developments, including satisfying fire flow requirements. Standards as set forth in the subdivision ordinance shall be maintained and improved as necessary.

Policy HS-6.9 Fuel Modification Programs: The County shall actively support fuel modification and reduction programs on public and private lands throughout the County, including vacant residential lots and greenbelts and, with the relevant partners, on adjacent private wildlands or federal lands with fire hazards that threaten the entity's jurisdiction as feasible and appropriate.

Policy HS-6.12 Weed Abatement: The County shall continue to encourage weed abatement programs throughout the County in order to promote fire safety.

Policy HS-6.20 – Fire Suppression Defense Zones: The County shall support the creation of wildfire defense zones for emergency services, including fuel breaks or other staging areas where WUI firefighting tactics could be most effectively deployed as appropriate consistent with the strategies identified in the Multi-Jurisdictional Local Hazard Mitigation Plan.

Tulare County Emergency Operations Plan

The Tulare County Emergency Operations Plan (EOP) was prepared to outline response activities in the event of a large-scale emergency or disaster. The EOP identifies existing conditions and infrastructure, identifies threats and hazards, and then describes the process and roles for the response and recovery actions. The EOP also implements the California Standardized Emergency Management System (SEMS), and provides organizational structure and functional guidance through the Initial Response, Extended Response, and Recovery phases of emergency operations.

The EOP provides a comprehensive, single source of guidance and procedures for the County to prepare for and respond to significant or catastrophic natural, environmental or conflict-related risks that produce situations requiring coordinated response. It further provides guidance regarding management concepts relating to response and abatement of various emergencies, identifies organizational structures and relationships, and describes responsibilities and functions necessary to protect life and property.

Tulare County Zoning Ordinance

As discussed in Section 2.0 – Project Description, the Project site is located in a semi-rural area on unincorporated Tulare County, upon lands zoned "AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum)". The County Zoning Ordinance contains both "General Provisions (Chapter 3, Section 15)" applicable to all land uses, as well as requirements specific to areas zoned "AE-20 (Chapter 3, Section 9.6)" such as the Project site. Please see Section 3.11.6 below for further discussion of the requirements of the Tulare County Zoning Ordinance specific to wildfire risks and applicable to the Project.

3.20.4 Significance Thresholds

3.20.4.1 Appendix G Thresholds from the State CEQA Guidelines

According to Appendix G of the State CEQA Guidelines, a Project may have a potentially significant impact related to wildfire if it occurs in or near a State Responsibility Area (SRA) or lands classified as Very High Fire Hazard Severity Zones (VHFHSZ). Because the Project site is located near a SRA areas classified as a

"High FHSZ" (located approximately 0.6 miles to the north/northeast of the Project site), the Project would have a significant effect if it would:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

d) Expose people or structures to significant risk, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

3.20.4.2 Additional Thresholds of Significance

There are no additional thresholds of significance related to the wildfire environmental issue. Requirements identified in the applicable Tulare County policies, plans and ordinances are addressed by the significance criteria above.

3.20.5 Methodology of Analysis

The analysis is based on the review of applicable federal, state and local requirements, Project design features, best management practices (BMPs), operating practices and other environmental protection measures that have been incorporated into the Project to minimize potential impacts on the environment.

As discussed in Section 3.11.4.1 above, the CEQA Appendix G criteria related to wildfire only apply to project's "*located in or near a state responsibility area or lands classified as very high fire hazard severity zones.*" As shown in Figure 3.11-1, per the most recent Fire Hazard Severity Zone map for Tulare County adopted by CalFire on November 7, 2007, the Project site is located near (approximately 0.6 miles away) a "state responsibility area (SRA)" designated as a "high fire hazard severity zone (FHSZ)" and is therefore subject to the CEQA wildfire criteria (see Section 3.11.6 for more detail).

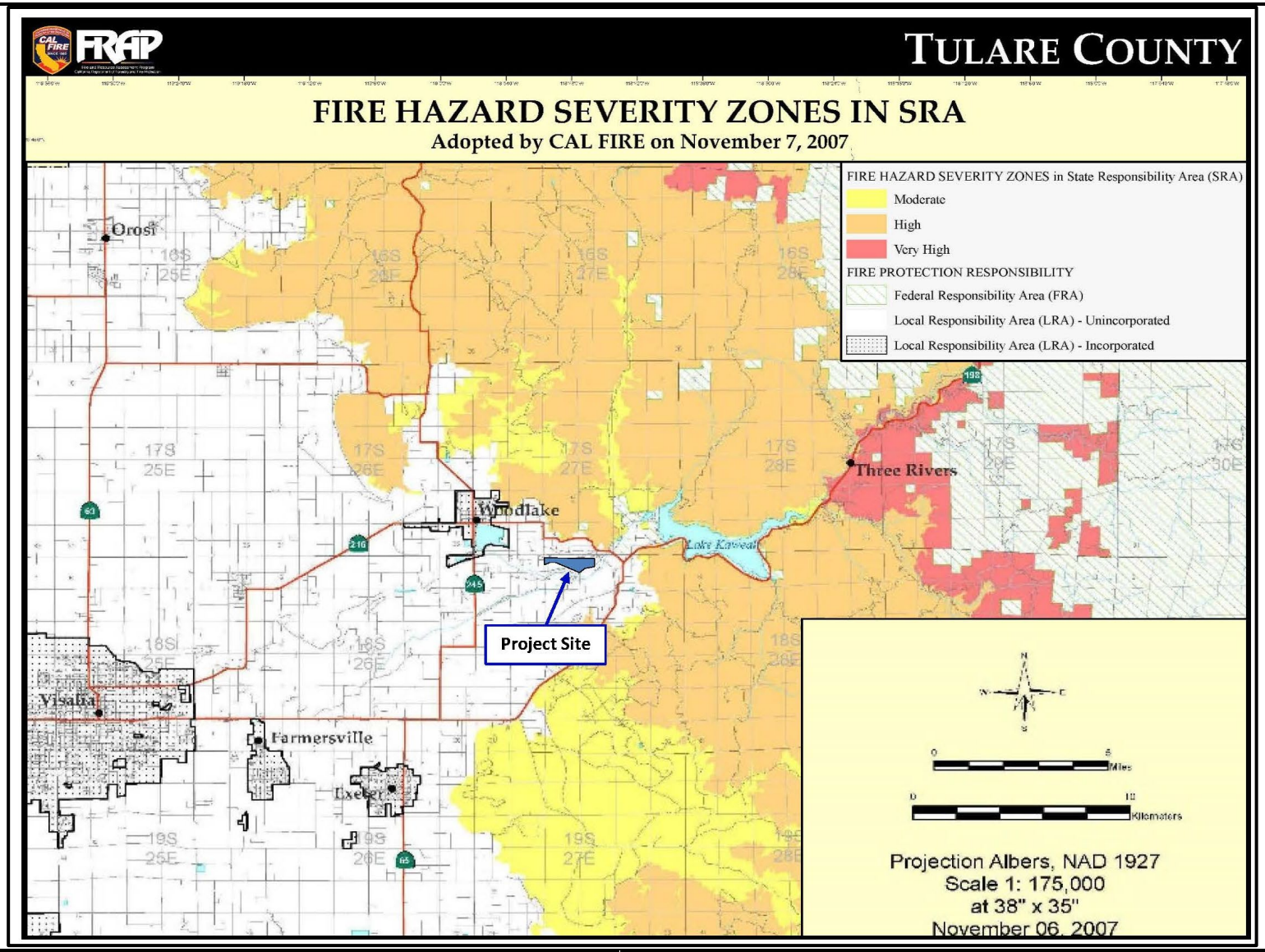
Although not subject to CEQA, the southern portion of the Project is located within a Local Responsibility Area (LRA), specifically an "Moderate" FHSZ as designated by CalFire. There are no areas on or near the Project site that have been designated "very high fire hazard severity zone (VHFHSZ)" by CalFire. The closest VHFHSZ is located approximately 7.0 miles away to the east, near the unincorporated community of Three Rivers.

3.20.5.3 Project Design Features and Environmental Protection Measures

Numerous design features, BMPs, operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental

protective measures that were considered in the evaluation of impacts related to wildfire include, but are not limited to, the following:

- Excavation equipment would be inspected, maintained and repaired to ensure that the equipment is operating properly, and leaks are prevented to the maximum extent feasible.
- Major maintenance and repairs of equipment and vehicles would be conducted off-site.
- Hazardous materials and hazardous waste would be managed in accordance with applicable local, state and federal regulations. Any hazardous waste generated at the site would be disposed of at a permitted off-site facility.
- Blasting would not be used for the reservoir excavation operations.



Base Map Source: CalFire (November 7, 2007)

Figure 3.11-1 FHSZs & SRAs – Tulare County

3.20.6 Project-Level Impacts and Mitigation Measures

3.20.6.4 Impair Emergency Response/Evacuation Plan

Impact Statement

Impact WI-1: *Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?* **(CEQA Guidelines Threshold Criteria (a))**

Impact Analysis

As discussed in Section 3.11.3.3, the Project is subject to the applicable requirements outlined in adopted emergency response and evacuation plans for the area. Additionally, the Tulare County General Plan and County Code of Ordinances contains various goals, policies, and maps that specify emergency response procedures, evacuation routes, etc.

As discussed in Section 1.0 – Introduction, the Project would not increase traffic on public roadways, specifically on-road haul trucks and employee/contractor vehicles, above the current baseline levels associated with the adjacent Seaborn facility. On-road haul trucks and employee vehicles would enter onto and exit the Project site via the existing access road through the Seaborn facility, which connects to Road 222. Because the Project has been designed to not exceed the historical Seaborn site activities and existing access roads would continue to be utilized, implementation of the Project would not result in an increase in on-road haul trucks/vehicles on public roads or a change the manner in which on-road haul trucks have historically accessed the adjacent Seaborn site.

The ingress and egress route to the Project site is in the western portion of the Project site, connecting to the existing Seaborn facility which connects to Road 222. Figure 2-2 in Section 2.0 – Project Description shows the location of this existing access road. This road would continue to serve as the single ingress and egress point for the Project and would be used by on-road haul trucks as well as the employees and other small work trucks and vehicles. In the event a wildfire threatens the Project site, evacuation from the Project site would occur from this access point to Road 222 to the west.

According to the Tulare County General Plan Figure 10-2 - Fire Threat (Tulare County, 2012), the Project site and adjacent areas are designated as either “Non-Fuel” or “Moderate” fire threat areas, which are the lowest County-designated risk levels. Although the wildfire threat is considered low per the County General Plan, because the Project is a mining/excavation operation and new structures or buildings are proposed (i.e., reservoir/dam structures), determined that many of the general development standards in County General Plan may apply. Notwithstanding, the Project is consistent with the applicable general development standards, as discussed below.

Per General Plan Policies HS-6.1 and HS-6.5, because the Project site is in a County-designated “Moderate Hazard” fire threat zone, the Project will be reviewed by the County Fire Chief prior to the issuance of any building permits associated with the reservoir structures. If needed, mitigations related to wildfire hazard recommended by the County Fire Chief/Warden as part of their Project review would be implemented

onsite. Potential recommendations provided by the County Fire Chief could include use of materials, types of structures, location of structures and subdivisions, road widths, location of fire hydrants, water supply, and other important considerations regarding fire hazard that may be technically feasible but not included in present other County ordinances or policies. Additionally, if determined necessary by the County per General Plan Policy HS-6.6, the Owners would develop a wildland fire management plans for the Project.

Although only specifically required for sites located in the County's Foothill and Mountain Plan Areas (the Project is located in the County's "Valley Region"), the County/Fire Department also recommends that vegetation and flammable materials be removed to maintain a minimum 100-foot-wide defensible space around homes and structures. As discussed previously, the site would be cleared of vegetation during the majority of excavation and reservoir construction/maintenance operations. Based on the design of the Project, including the excavation pit and the reservoir structures, the site is not expected to present an increased wildfire risk compared to existing conditions (e.g., undeveloped grassland, stressed/dry plant communities, etc.). Additionally, no Project construction activities, operations or revegetation planting would occur within 100-feet of an existing structure, residence or proposed development. Accordingly, the Project would be considered consistent with the County's fuel break/defensible space provisions.

In the event of an emergency or wildfire that would require evacuation of the Project site, the existing access road connecting to the adjacent Seaborn site and Road 222 to the west would be utilized. Due to the limited number of haul trucks and associated employees and/or guests/vendors (approximately 4-8) that would be onsite and need to be evacuated from McKay Point site at any given time , and that potential wildfire hazards would most likely originate from the undeveloped foothills/open space areas north and east of the Project site (Figure 3.11-1), the use of a single evacuation point in the western portion of the Project site connecting to the Seaborn facility would be considered consistent with the County's evacuation route and emergency evacuation requirements.

While Tulare County has not designated specific evacuation routes, State Route (SR) 216 located approximately 0.5 miles north of the Project site is considered the main arterial roadway/evacuation route that would serve the Project area in the event of a wildfire. The Project access road connects to Road 222, which eventually connects to SR-216 to the north, and Project employees would travel this route in the event of a wildfire evacuation. The existing access road from the Project site, Road 222 and SR-216 have sufficient capacity to safely evacuate the small number of onsite employees and/or visitors in a timely manner. Additionally, none of the physical improvements or site design features proposed by the Project would adversely affect these existing evacuation routes along Road 222/SR-216 (e.g., reduce visibility, impact existing traffic flow, etc.) or impede evacuations from surrounding agricultural, industrial and residential areas.

As discussed in Section 3.11.3.3, the County's Emergency Operations Plan (EOP) provides a comprehensive, single source of guidance and procedures for the County to prepare for and respond to significant or catastrophic natural, environmental or conflict-related risks that produce situations requiring coordinated response. It further provides guidance to County agencies and first responders

regarding management concepts relating to response and abatement of various emergencies, identifies organizational structures and relationships, and describes responsibilities and functions necessary to protect life and property.

For the reasons outlined above, the Project would not create any new impediments to existing evacuation routes or result in unsafe conditions in the event of a wildfire. The existing access point on the western boundary of the Project site, as well as the existing access road through the Seaborn facility, would allow for the safe evacuation of onsite employees and guests/vendors onto Road 222 and SR-216. Additionally, the Project would not conflict with any of the applicable emergency response or evacuation plans, policies and procedures found in the County's General Plan/Ordinance Code or other emergency plans, nor would it impede evacuation of people and vehicles originating from neighboring properties. Therefore, the Project would have a less than significant impact with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.20.6.5 Exacerbate Wildfire Risks & Expose Occupants to Uncontrolled Wildfire

Impact Statement

Impact WI-2: *Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of wildfire?* **(CEQA Guidelines Threshold Criteria (b))**

Impact Analysis

As shown on Figure 3.11-1, the Project site is located near (approximately 0.6 miles away) SRAs areas designated as "high" FHSZs. Although the Project site is not within a State- or County-designated fire hazard zone, past land uses (i.e., cattle grazing) have resulted in most of the existing Project site being converted to non-native grassland and disturbed natural plant communities. These plant communities are also currently stressed due to years of drought conditions, resulting in an area that contains a substantial amount of tinder and kindling. Thus, existing conditions at the Project site are highly prone to wildfires and present a fire hazard.

Through development of the site (i.e., excavation and construction of the reservoir), the Project site would be cleared and residual debris would be removed in accordance with local, state and federal regulations.

The site would also be completely cleared of existing vegetation, and no landscaping or revegetation of the site is proposed. Other than the reservoir structures (e.g., check dams, channels, weirs, etc.), all of which would be constructed of non-flammable concrete, there will be no large permanent buildings or structures installed within the McKay Point site that would create or exacerbate a fire hazard. A 10,000-gallon diesel aboveground storage tank (AST) will be installed in the southern portion of the Project site; however, this tank will be reinforced and installed within a protective structure. Additionally, as shown on Figure 2-4, the diesel AST will be installed on the southern portion of the Project site adjacent to the St. Johns and Kaweah Rivers, away from adjacent open spaces where wildfires may originate. Ultimately, because the site will be cleared of all existing stressed vegetation, the 10,000-gallon diesel AST will be properly protected, and no other flammable structures would be constructed onsite, the Project is expected to decrease wildfire risk to Project personnel and surrounding properties compared to the existing onsite conditions.

In addition, the Project site would have steep pit walls as reservoir excavation progresses to a final pit depth of 60-feet below ground surface (bgs). Cleared and excavated mining areas would be barren soil, devoid of vegetation, and would therefore serve as a barrier between the agricultural areas and associated residences within the community of Lemon Cove to the south and west in the event of a wildfire originating from the open spaces/foothills located farther to the north and east. As discussed above, existing conditions onsite conditions include drought stressed vegetation. These existing conditions present more of a fire hazard than would the proposed Project. Conversely, once the Project site is excavated and the concrete reservoir structures constructed, the site would act as a "fire break" or "safe zone" minimizing the spread of a fire. Thus, the Project would potentially reduce the risk of wildfire hazards to nearby areas compared to the conditions that currently exist onsite.

During operation of the Project, flammable materials would be managed in accordance with applicable federal, state, and local regulations.

The fire station closest to the Project site is Tulare County Fire Department Station #13 located at 32490 CA-198, Lemon Cove, California 93244, approximately 1.2 miles to the southeast. Additionally, the Project site could receive fire response assistance from the City of Woodlake's Fire Department Headquarters (located at 216 E. Naranjo Boulevard, Woodlake, California 93286), approximately 2.5 miles to the northwest through the County's mutual aid/response agreements with various cities through Tulare County. In the unlikely event of a fire originating on or near the Project site, response time to the Project site would typically be within 5 minutes.

For these reasons, the Project would result in a less than significant impact and is not expected to exacerbate a wildfire risk or expose Project personnel and vendors to increased risk due to uncontrolled wildfire.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.20.6.6 Require Installation of Infrastructure that may Exacerbate Fire Risk

Impact Statement

Impact WI-3: *Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?* **(CEQA Guidelines Threshold Criteria (c))**

Impact Analysis

The only permanent buildings or structures proposed within the Project site would be the various reservoir structures (e.g., channels, chutes, weirs, etc.) the majority of which would be constructed with concrete. Additionally, a 10,000-gallon diesel AST would be installed onsite at the beginning of the reservoir operations phase, but this AST would be built to code, using nonflammable materials and with all applicable safety devices. Early in the reservoir excavation, the portable screen/wash plant and the crushing/recycle plant would also be installed in the bottom of the excavation pit. The plants would be constructed of nonflammable materials. Once excavation operations are complete, these temporary structures would be dismantled and removed.

Electrical service required for the onsite aggregate processing plant would be provided by Southern California Edison (SCE) and obtained from the existing electrical infrastructure/connections located along the northern boundary of the Project site. The electrical demand for the aggregate processing operations at the McKay Point site during reservoir excavation would be consistent with the historical electrical demand associated with the adjacent Seaborn facility. Other than the proposed SCE connection for the aggregate processing plants, no other utility infrastructure (natural gas, sewer, etc.) would be located within the Project site.

During the reservoir excavation phase, a mobile fuel and/or maintenance truck may be brought onsite to conduct minor maintenance and refuel mobile equipment. As discussed in Section 3.6 – Hazards and Hazardous Materials, a site-specific Storm Water Pollution Prevention Plan (SWPPP) and BMPS would be prepared for the Project. The SWPP will specifically address the prevention and, if needed, response to onsite spills of hazardous materials, including fuels and flammable materials (e.g., use of catch trays, cleanup measures in the event of a spill, etc.). Additionally, due to the installation of the 10,000-gallon diesel AST, a site-specific Spill Prevention, Control, and Countermeasure (SPCC), which would also outline preventative and cleanup measures related to oil storage and spill cleanup. Implementation of the

procedures outlined in these plans would mitigate the potential for fires due to hazardous releases during equipment fueling and maintenance.

The clearing of the site to allow for excavation of the reservoir basin would result in a type of "fire break" or "safe zone" that would help prevent the spread of a wildfire originating from areas adjacent to the Project site. In addition, existing draught-stressed vegetation and grassland onsite would be would be cleared to allow for the proposed Project; thus, further reducing a potential fire hazard onsite. Therefore, in addition to having a less than significant impact, the Project would also minimize the potential of hazards associated with a wildfire.

Since the Project would not involve the installation of any permanent new infrastructure that may exacerbate fire risk, and because installation/maintenance of the diesel AST as well as mobile equipment fueling and maintenance within the Project site would be conducted in accordance with the safety and spill prevention plans (e.g., SWPPP, SPCC, HMBP, etc.), the Project would have a less than significant impact in terms of potential to generate onsite fires due to concerns related to installation of new infrastructure or exacerbating risks due to ongoing Project activities. Therefore, impacts are considered less than significant with no mitigation required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.20.6.7 Expose People or Structures to Significant Risks due to Post-Fire Instability

Impact Statement

Impact WI-4: *Would the project expose people or structures to significant risk, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?* **(CEQA Guidelines Threshold Criteria (d))**

Impact Analysis

As discussed in Section 3.11.6.6 above, other than construction of the concrete reservoir structures and installation of the diesel AST, implementation of the Project would not involve the placement of permanent structures on the Project site. Now of these structures would be occupied, therefore the Project would not expose people or structures onsite to significant risks. In addition, the pit/basin resulting from the reservoir excavation operations would direct any flood waters, drainage and/or

landslides into the bottom of the excavated pit away from people and structures located offsite. Furthermore, the reservoir itself would help contain potential flooding due to any runoff or post-fire instability originating upstream (i.e., Kaweah River). The excavated Project site and reservoir structures would therefore act as a barrier that would contain any post-fire instability, such as changes to drainage and/or generation of landslide materials. The excavated Project site would also minimize impacts to the rural-residences/residential neighborhoods to the south resulting from upstream post-fire events, such as flooding, runoff and landslides originating from Lake Kaweah or the Kaweah River. For these reasons, the Project would not expose people or structures to significant risks associated with flooding or landslides. Conversely, the Project could potentially reduce the risk to people and structures in the surrounding areas compared to existing conditions. The Project would have a less than significant impact related to runoff, post-fire instability, or drainage after wildfires.

In addition, as discussed in Section 3.4 – Geology and Soils, the pit slopes would comply with the Surface Mining and Reclamation Act (SMARA) slope stability requirements and the slopes would be inspected by a California Certified Engineering Geologist (CEG) for unsafe slope conditions following a natural disaster, such as wildfire, prior to restarting excavation and/or reservoir construction activities. Due to the stability of the proposed pit design (i.e., 3H:1V [horizontal to vertical] slopes) and proposed ongoing slope inspections/maintenance, the Project would ensure that safe onsite slope conditions would be maintained following the unlikely event of a wildfire, and no additional mitigation is required.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance after Mitigation

Not applicable.

3.20.7 Cumulative-Level Impacts and Mitigation Measures

Table 3-1 identifies the other projects that were identified on the County and the City of Woodlake webpage that could be considered cumulative projects in regard to potential cumulative impacts. In addition, the existing and approved mining projects in the immediate vicinity of the Project were considered in the cumulative analysis. As noted in Table 3-1, none of the cumulative projects meet the criteria to be further evaluated in relation to cumulative impacts associated with wildfire hazards.

The context for cumulative impacts for wildfire impacts is the immediate area encompassing the site vicinity (1- to 3-mile radius from the Project site). As discussed in the impact analysis, specifically Section 3.11.6.5 through Section 3.11.6.8 above, the Project was determined to have either no impact or a less

than significant impact. Since the Project would present less than significant impacts related to wildfire, there would be no cumulative impact in conjunction with the other cumulative projects.

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4.0 ALTERNATIVES

This section describes a range of Project alternatives and compares the associated potential environmental impacts of alternatives considered to those of the Project. Section 4.1 discusses the California Environmental Quality Act (CEQA) requirements for considering alternatives to the Project, Section 4.2 provides a summary of the Project objectives, Section 4.3 discusses the alternatives considered but rejected from further analysis, Sections 4.4 and 4.5 provide analyses of the alternatives as compared to the Project, and Section 4.6 identifies the environmentally superior alternative, as required by CEQA.

4.1 CEQA Requirements for Analysis of Alternatives

As discussed in Section 1.10, the CEQA Guidelines specify that an Environmental Impact Report (EIR) must describe a reasonable range of alternatives to a project, or to the location of a project, which could feasibly attain most of the basic project objectives (Guidelines §15126.6(a)). The EIR must focus on alternatives that are capable of eliminating or substantially reducing the significant adverse impacts caused by a project (Guidelines §15126.6(c)), and alternatives to the "whole of the project" rather than the project's component parts. An EIR must include an alternatives analysis even if the EIR concludes that a project will not cause any significant adverse impacts.

The "no project" alternative, which considers impacts that would occur if existing conditions continue, must be considered (Guidelines §15126.6(e)), and the EIR must also identify the environmentally superior alternative. If the "no project" alternative is the environmentally superior alternative, the EIR must identify an environmentally superior alternative from among the other alternatives (Guidelines §15126.6(e)(2)). The EIR should not consider alternatives "*whose effect cannot be reasonably ascertained and whose implementation is remote and speculative*" (Guidelines §15126.6(f)(3)). An EIR need not evaluate an alternative that is considered speculative, theoretical, or unreasonable. Not every potentially feasible alternative need be considered; rather, the relevant test is whether a "reasonable range" of feasible alternatives is considered for that particular project (Guidelines §15126.6(a)).

4.2 Project Objectives

As discussed in Section 1.2, the Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.

- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet as part of the proposed Project.
- Deliver water back to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with West Coast Sand and Gravel (WCSG) to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the construction and development costs.

Once the reservoir is constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Kaweah and St. Johns River Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.

4.3 Alternatives Considered and Rejected from Further Analysis

CEQA Guidelines Section 15126.6(c) requires that an EIR identify alternatives that were considered and rejected as infeasible, and briefly explain the reasons for rejection. Among the factors that may be used to eliminate alternatives from detailed consideration in any EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts. The following alternatives were initially considered but were eliminated from further consideration in this EIR because they do not meet project objectives and/or were infeasible.

4.3.1 Alternative Location

CEQA Guidelines Section 15126.6(f)(2)(b) states the following:

> *"If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. For example, in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location."* (Guidelines 15126.6(f)(2)(b)).

The Project needs to be located in immediate proximity to the McKay Point Check Structures and where the Kaweah River diverges into the Lower Kaweah River and St. Johns River in order to achieve the Project objectives of capturing and re-regulating released from Lake Kaweah. For this reason, alternative locations are considered infeasible and were not considered further.

4.3.2 Reduced Reservoir Depth Alternative

CEQA Guidelines Section 15126.6(f)(1) states that one of the factors that may be taken into account when addressing the feasibility of alternatives is "*economic viability*". Additionally, CEQA Guidelines Section 15126.6(f)(2)(a) states that only alternatives "*that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR*".

Depth is of particular importance in that it permits reservoir construction to occur in such a way as to minimize groundwater inflows to the reservoir through seepage when the reservoir is dry, and corresponding reservoir outflows when the reservoir is full. If sufficient depth is not achieved, the reservoir cannot be operated without high levels of bi-directional seepage, which would not realize Project objectives. Regardless of reservoir depth, the slurry wall would need to be constructed to the appropriate design depth to reduce seepage. This is because a slurry wall constructed to an incorrect depth would not properly control seepage, since water would pass into and out of the reservoir under the slurry wall. Were that to occur, it would likely result in regulatory issues and/or significant impacts related to water quality. Refer to the Hydrology and Water Quality Technical Study (SLR, 2022) in Appendix G for additional detail related to the prescribe slurry wall design.

A reservoir's volume is three-dimensional, which means changes in depth result in significant changes in total reservoir storage capacity as well as the total volume of material to be excavated. A portion of the

high cost of construction of the slurry wall and other reservoir structures is expected to be offset by the royalties received for the excavated material. Since a lesser depth would not provide the volume nor the royalties needed to offset a larger portion of the reservoir construction costs, this alternative is economically infeasible.

A shallower reservoir would also significantly reduce the storage volume, which in turn would minimize the effectiveness of storm water layoff, flood prevention, and ability to capture and re-regulate water released from Lake Kaweah, all of which areas directly related to the depth and resulting storage volume of the proposed reservoir.

For these reasons, an alternative reservoir (reduced or lesser) depth is considered technically and economically infeasible and was not evaluated further.

4.3.3 Reduced Reservoir Size Alternative

Size is also an important consideration directly tied to depth for determining Project feasibility, as the resulting storage capacity corresponds to the captured flood flows when water is released from Terminus Dam. A much larger project had been considered to maximize use of the Owners' property, but was reduced to the proposed size (approximately 110 acres) in order to retain most of the mixed oak-riparian woodland which occur in the southeastern portion of the Project site, and additional lands along the river (Figure 3.4-1 – Biological Study Area in Section 3.4 – Biological Resources).

As discussed above, a reservoir's volume is three-dimensional, which means reducing reservoir size would result in significant changes in storage capacity and excavated volume. The high cost of construction of the slurry wall and other reservoir infrastructure is expected to be partially offset by the royalties the Owners will receive from WCSG for the excavated material. Since a lesser size would not provide the volume nor the royalties needed to offset a larger portion of the overall construction costs, including those associated with the slurry wall, this alternative is economically infeasible.

A smaller reservoir would also significantly reduce the storage volume, which in turn would minimize the effectiveness of storm water layoff, flood prevention, and ability to capture and re-regulate water released from Lake Kaweah), all of which areas directly related to the depth and resulting storage volume of the proposed reservoir.

For these reasons, similar to the “Reduced Reservoir Depth Alternative” described in Section 4.3.2, an alternative reservoir (reduced or lesser) size is considered technically and economically infeasible and was not evaluated further.

4.4 Alternatives Considered for Evaluation

The following Project alternatives are analyzed in this DEIR and are described in more detail below:

- No Project Alternative;
- Wet Excavation Method Alternative; and
- Clay Liner Installation Alternative.

4.4.1 Mitigation Measures Common to Project Alternatives

Except for the "No Project Alternative", all of the mitigation measures identified throughout Section 3.0 of the DEIR apply to the alternatives presented below. Upon implementation of these mitigation measures, potentially significant impacts identified therein would be mitigated to less than significant levels, unless otherwise noted.

4.5 Analysis of the Project Alternatives

The analyses of alternatives presented below disclose the differences identified in the impacts associated with each alternative, when compared to those identified for the Project throughout Section 3.0 as listed below.

- Air Quality (Section 3.3);
- Biological Resources (Section 3.4);
- Cultural Resources (Section 3.5);
- Geology/Soils (Section 3.7);
- Greenhouse Gas Emissions (Section 3.8);
- Hazards and Hazardous Materials (Section 3.9);
- Hydrology/Water Quality (Section 3.10);
- Land Use and Planning (Section 3.11);
- Noise (Section 3.13);
- Tribal Cultural Resources (Section 3.18); and
- Wildfire (Section 3.20).

In most instances, the impacts were the same. The differences that were identified are described both below, within the discussion of each alternative, and within the individual resource analyses throughout Section 3.0. With the exception of the "No Project Alternative", each of the alternatives discussed below would meet Project objectives.

4.5.1 No Project Alternative

The discussion and evaluation of a "No Project (No Development) Alternative" is required by the CEQA Guidelines. The "no project" alternative compares the environmental impacts of the Project with the environmental impacts of not approving the Project. (Guidelines § 15126.6(e)(1). According to the CEQA Guidelines:

> The "no project" analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, as well as what would be ***reasonably expected to occur in the foreseeable future if the project were not approved***, based on current plans and consistent with available infrastructure and community services. (Guidelines § 15126.6(e)(2) [emphasis added].)

The "no project" analysis differs depending on the proposed project. For development projects on identifiable property, such as the current Project:

> [T]he "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment. (Guidelines § 15126.6(e)(3)(B)

Because the Project is a development project on identifiable property, this "no project" analysis compares the environmental effects of the property remaining in its existing state against environmental effects which would occur if the Project is approved. If the Project is not approved, the existing conditions are reasonably expected to occur into the foreseeable future, as the Owners have no other plans for the Project site, and no other development plans for the Project site exist. The only predictable consequence of Project disapproval is the continuation of the existing environment at the Project site.

Under the "No Project Alternative", the Project site would remain in its relatively undisturbed and undeveloped condition. The "No Project Alternative" would be considered environmentally superior because it would have no site impacts to Air Quality; Biological Resources; Cultural Resources; Geology/Soils; and Noise.

However, the "No Project Alternative", by definition, would not meet the Owners' Project objectives, nor would it result in the Project benefits as described in Section 4.2. Furthermore, as required by CEQA Guidelines Section 15126.6(e)(2), "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." As discussed below in Section 4.6 below, the environmentally superior alternative is the "Project".

4.5.2 Wet Excavation Method Alternative

Under the "Wet Excavation Method Alternative", the slurry wall installation would be deferred until the majority of the excavation is completed. This would allow groundwater seepage to flow into the pit which would require the use of "wet excavation" methods. Draglines would most likely be used to remove the aggregate from the pit. Additionally, material processing (i.e., processing/wash plant and portable crush/recycle plant) directly within the excavation pit would no longer be feasible, and excavated material would have to be transported offsite for processing.

Key construction differences under the "Wet Excavation Method Alternative" as compared to the Project include the following:

- Seepage would be allowed to flow into the excavation pit until equilibrium is reached with the surrounding aquifer.
- Excavation would occur below the water elevation using "wet excavation" equipment and techniques (i.e., underwater dredging).
- Excavated material would have to be transported offsite for processing.
- No dewatering would be conducted until wet excavation is completed.
- Slurry wall installation would be deferred until the end of the excavation phase.
- Upon completing wet excavation, dewatering would be implemented to create the conditions needed required to complete reservoir excavation by conventional methods.
- Dewatering would involve the pumping of approximately 3,500 acre-feet back into the aquifer via one of the following measures:
    - A series of onsite infiltration galleries consisting of ditches located on the Project site that would be covered with granular materials to minimize evaporation;
    - Infiltration at one or more of the immediately adjacent ponds and/or infiltration galleries on the CEMEX facility (north of the Project site); and/or
    - Infiltration at one or more of the immediately adjacent ponds on the Seaborn facility (west of the Project site).
- After dewatering, the slurry wall would be installed and seepage would be the same as described for the Project.

Potential changes in environmental impacts associated with this "Wet Excavation Method Alternative" as compared to the Project are summarized below.

Air Quality: The "Wet Excavation Method Alternative" would result in the same air quality impacts as those described for the Project in Section 3.3, except for the following:

- Although short-term equipment combustion emissions resulting from construction of the slurry wall early in the excavation phase would be avoided under the "Wet Excavation Method

Alternative", ultimately wet excavation methods (e.g., using a dragline), would result in greater combustion emissions over the life of the Project. This is because the excavated material contains water, which is not present in materials derived from dry excavation methods. The weight of the additional water requires more engine horsepower (HP) to both lift the material out of the excavation pit and to transport it to the onsite processing plant(s). This would result in greater emissions of ozone precursors (e.g., NOx) and diesel particulate matter (PM), which is the primary toxic air contaminant of concern for this Project. Risk of health effects would be greater for the "Wet Excavation Method Alternative" than for the Project due to increased diesel PM emissions. However, this increase is expected to result in less than significant impacts. Prior to the material drying after being excavated, there would be less fugitive dust emissions during excavation.

Additionally, material processing using the processing/wash plant and portable crush/recycle plant directly within the excavation pit would not be feasible, as the pit would be partially inundated with groundwater due to seepage. As such, excavated material would have to be transported offsite using haul trucks for processing. Similar to the use of the dragline, this would also result in greater combustion emissions and diesel fuel consumption during the excavation phase of the Project, due to the increased use and travel distances of haul trucks.

As shown in Table 3.3-31 in Section 3.3, health risk from the Project is less than significant at all receptors except. However, the acute and chronic non-cancer health risks were assessed for dry mining conditions where wet excavation methods using a dragline and increase haul truck activity would not occur. As was the case for the Project, the "Wet Excavation Method Alternative's" health risk impacts are expected to be less than significant; however, due to the increase in NOx emissions, which is the primary toxic air contaminant of concern, the "Wet Excavation Method Alternative" is expected to result in higher health risk impacts to nearby receptors compared to the Project.

Biological Resources: Because the "Wet Excavation Method Alternative" would have the same footprint of disturbance (approximately 110 acres) as the Project, this alternative would result in the same biological resource impacts as those described for the Project in Section 3.4.

Cultural Resources: Because the "Wet Excavation Method Alternative" would have the same footprint of disturbance (approximately 110 acres) and would reach the same final depth (60- to 80-feet below ground surface [bgs]) as the Project, the "Wet Excavation Method Alternative" would result in the same cultural resource impacts as those described for the Project in Section 3.5.

Geology and Soils: The "Wet Excavation Method Alternative" would result in the same impacts to geology and soil resources as those described for the Project in Section 3.7, except for the following:

- ***Slope Stability:*** The factor of safety for the "Wet Excavation Method Alternative" was calculated to be 2.0 under static conditions, which is in excess of the stability criterion established at 1.5. The pseudo-static factor of safety was calculated to be 1.1 under a seismic coefficient of 0.1 g (half the peak ground acceleration [PGA] for the 2,475-year event), meeting the minimum

criterion of 1.1. The factor of safety under saturated or drawdown conditions was calculated to be 1.3, meeting the stability criterion 1.3. This means the "Wet Excavation Method Alternative" meets or exceeds factor of safety threshold criteria under all conditions. As such, it was determined that the "Wet Excavation Method Alternative" would be stable and safe as designed. In addition, the relatively massive alluvial deposits have a low susceptibility to landsliding or lateral spreading due to the lack of geologic structures such as joints, contacts, and bedding, which may present preferred shear surfaces. The "Wet Excavation Method Alternative" is expected to result in less than significant impacts related to the slope stability, on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse during reservoir excavation, construction, and operation (SLR, 2015).

Greenhouse Gas Emissions: The "Wet Excavation Method Alternative" would result in the same greenhouse gas emissions impacts as those described for the Project in Section 3.8, except for the following:

- Wet excavation methods, using a dragline, would result in greater combustion emissions and fewer dust emissions. This is because the excavated material contains water, which is not present in materials derived from dry excavation methods. The weight of the additional water requires more engine HP to lift the material out of the excavation and to transport it to the onsite processing plant(s). Additionally, excavated material would have to be transported offsite using haul trucks for processing, which would also result in greater combustion emissions and diesel fuel consumption during the excavation phase of the Project, due to the increased use and travel distances of haul trucks. These changes would result in greater emissions of carbon dioxide, which is the primary greenhouse gas emitted by such a Project. However, because these emissions are fairly minor when compared to overall Project emissions and the baseline (see Section 3.8), this increase is expected to result in less than significant impacts.

Hazards and Hazardous Materials: The "Wet Excavation Method Alternative" would not require the use of additional hazardous materials, nor would wet mining operations generate additional hazardous wastes compared to the Project. Therefore, this alternative would result in the same hazards and hazardous waste impacts as those described for the Project in Section 3.9.

Hydrology/Water Quality: The "Wet Excavation Method Alternative" would result in the same impacts to hydrology and water quality resources as those described for the Project in Section 3.10, except for the following:

- ***Evaporation:*** Groundwater discharging into the excavation would be exposed to the atmosphere, whereas minimal exposure occurs when the groundwater is within the pore spaces of the subsurface. Water in the excavation would therefore be subject to more evaporation than under baseline conditions. As water evaporates from the excavation, more groundwater would discharge into the excavation to maintain equilibrium. An estimated 580 acre-feet (AF) per year (equivalent to approximately 360 gallons per minute [gpm]) of evaporation would occur while the excavation maintains equilibrium through groundwater discharge. This rate is minimal (less than

0.005%) compared to the groundwater in storage within the Kaweah Subbasin (to a depth of 300-feet) of 11,600,000 AF (DWR, 2003). This rate is also negligible (less than 0.07%) compared to the 862,000 AF (699,000 AF of which is groundwater) delivered annually by TID to their customers for irrigation purposes (Fugro, 2007).

Under the "Wet Excavation Method Alternative", an incremental loss of up to 580 AF per year could occur through evaporation under this Project alternative. This is the maximum estimated evaporation using wet excavation methods, which is based on the full lateral extent of the excavation being reached. This incremental loss would not be permanent, and would cease by the time reservoir operations begin (approximately 20 years). Because this loss is minimal compared to the total storage in the basin and compared to the amount of water delivered for irrigation purposes in Tulare County/TID's region, the "Wet Excavation Method Alternative" is expected to result in negligible incremental groundwater losses. As such, the "Wet Excavation Method Alternative" is expected to result in less than significant impacts on groundwater evaporation.

Land Use and Planning: Because the "Wet Excavation Method Alternative" would have the same footprint of disturbance (approximately 110 acres) and would not involve any changes to the land uses/land uses designations considered under the Project, this alternative would result in the same land use and planning impacts as those described for the Project in Section 3.11.

Noise: The "Wet Excavation Method Alternative" would result in the same noise impacts as those described for the Project in Section 3.13, except for the following:

- Short-term equipment noise impacts resulting from construction of the slurry wall early in the excavation phase would be avoided under the "Wet Excavation Method Alternative". However, wet excavation methods, using a dragline, would result in increased long-term equipment noise because the excavated material contains water, which is not present in materials derived from dry excavation methods. The weight of the additional water requires more engine HP to lift the material out of the excavation, which in turn produces increase noise impacts. Additionally, the majority of dredging equipment would operate at-grade without any natural noise attenuation provided by the excavation pit walls, as would be the case under the Project.

Tribal Cultural Resources: Because the "Wet Excavation Method Alternative" would have the same footprint of disturbance (approximately 110 acres) and would reach the same final depth (60- to 80-feet below ground surface [bgs]) as the Project, the "Wet Excavation Method Alternative" would result in the same impacts to undiscovered tribal cultural resources as those described for the Project in Section 3.18. Additionally, implementation of this alternative would not alter the tribal consultation process considered under the Project. Therefore, this alternative would result in the same impacts to tribal cultural resources as those described for the Project in Section 3.18.

Wildfire: The "Wet Excavation Method Alternative" would have the same footprint of disturbance (approximately 110 acres) as the Project and would not create and/or avoid any Project-related impacts

to wildfire resources or related hazards. The "Wet Excavation Method Alternative" would result in the same wildfire impacts as those described for the Project in Section 3.20.

4.5.3 Clay Liner Installation Alternative

Under the "Clay Liner Installation Alternative", the site would be developed in the same manner as the Project with one notable change. Specifically, under this alternative, early as feasible in the excavation phase, clay liners would be installed in lieu of the slurry walls around the perimeter of the excavation pit/reservoir to minimize groundwater seepage into/out of the reservoir, and to maintain conditions dry enough to continue excavation activities. Due to the nature of the clay material present at the Project site, a clay liner could feasibly be used as an alternative to a slurry wall and is expected to keep the infiltration rate below the required 500 gpm. As with the slurry walls, the clay liner would consist of below-grade barriers that restrict groundwater flow or support excavations and structures, using bentonite clay generated by excavation operations and collected onsite.

As with the slurry wall, clay liner construction would require clearing and grubbing of approximately 26 acres, and excavating approximately 109,000 cubic yards of native soil to form the trench where the clay liner would be installed. However, rather than importing bentonite and other silty/clay materials to the Project site, as is proposed with the slurry wall, these materials would be generated onsite to construct the clay liner. Specifically, excavated soils would be screened and mix onsite for use in the clay liner, to generate the appropriate mixture of bentonite, silty/clay fines and native soil needed to construct the appropriate clay liner. The clay liner material would be placed into the trench. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the clay liner.

Key construction differences under the "Clay Liner Installation Alternative" as compared to the Project include the following:

- Bentonite, silty/clay fines and native soil would be generated onsite to construct the clay liner. No material would need to be imported/delivered to the Project site.
- Depending on the quantity of bentonite and silty/clay generated during reservoir excavation, timing of the installation of the clay liner would potentially be deferred when compared to the slurry wall.
    - The clay liner could not be fully constructed until a sufficient quantity of material is extracted and processed onsite.
    - This might necessitate the use of supplemental dewatering techniques (e.g., pumping, infiltration galleries/ponds, etc.) and/or the use if wet excavation equipment and techniques (i.e., underwater dredging) until the clay liner is complete.
- Depending on the properties of the excavated material/soil used to construct the clay liner, additional slope stability measures, such as the use of soil amendments and/or other reinforcing structures, may be required.

Potential changes in environmental impacts associated with this "Clay Liner Installation Alternative" as compared to the Project are summarized below.

Air Quality: The "Clay Liner Installation Alternative" would result in the same air quality impacts as those described for the Project in Section 3.3, except for the following:

- Because the clay liner could not be fully constructed until a sufficient quantity of bentonite and silty/clay material is extracted and processed onsite, installation of the clay liner would be deferred when compared to the slurry wall under the Project. This would most likely necessitate the use of wet mining or dewatering techniques to ensure the excavation pit remains dry until the clay liner can be fully constructed. Both of these scenarios would result in greater combustion emissions, either due to use of a dragline and/or use of supplemental dewatering pumps. Risk of health effects would also be greater for the "Clay Liner Alternative" than for the Project due to increased diesel PM and ozone precursors (e.g., NOx) emissions. As a result, although the air quality impacts for the "Clay Liner Installation Alternative" is expected to result in less than significant impacts, total emissions are expected to be higher when compared to those of the Project.

Biological Resources: Because the "Clay Liner Installation Alternative" would have the same footprint of disturbance (approximately 110 acres) as the Project, the "Clay Liner Installation Alternative" would result in the same impacts to biological resources as those described for the Project in Section 3.4.

Cultural Resources: Because the "Clay Liner Installation Alternative" would have the same footprint of disturbance (approximately 110 acres) and would reach the same final depth (60- to 80-feet bgs) as the Project, the "Clay Liner Installation Alternative" would result in the same impacts to cultural resources as those described for the Project in Section 3.5.

Geology and Soils: The "Clay Liner Installation Alternative" would result in the same geology and soils impacts as those described for the Project in Section 3.7, except for the following:

- ***Slope Stability:*** The factor of safety for the "Clay Liner Installation Alternative" is expected to be similar to those calculated for the "Wet Excavation Method Alternative" discussed in Section 4.5.2 above; however, this would be depended upon the timing of the installation of the clay liner. Although the clay liner would stabilize the excavation slopes sooner than under the wet excavation scenario, the use of a slurry wall early in the excavation phase, as contemplated under the Project, would provide greater slope stability.

  Additionally, the quality and quantity of bentonite and silty/clay underlying the Project site is unknown. Depending on the properties of the excavated material/soil used to construct the clay liner, additional slope stability measures, such as the use of soil amendments and/or other reinforcing structures, may be required, which have the potential to result in increased slope stability concerns.

Greenhouse Gas Emissions: The "Clay Liner Installation Alternative" would result in the same greenhouse gas emissions impacts as those described for the Project in Section 3.8, except for the following:

- Depending on the timing and availability of onsite bentonite and silty/clay, installation of the clay liner may necessitate the use of a dragline and/or dewatering pumps, which would increase associated combustion emissions. Therefore, the impact on greenhouse gases is expected to slightly increase for the "Clay Liner Installation Alternative" when compared to the Project.

Hazards and Hazardous Materials: The "Clay Liner Installation Alternative" would not require the use of additional hazardous materials, nor would installation of a clay liner generate additional hazardous wastes compared to the Project. Therefore, this alternative would result in the same impacts as those described for the Project in Section 3.9.

Hydrology/Water Quality: The "Clay Liner Installation Alternative" would result in the same impacts to hydrology and water quality resources as those described for the Project in Section 3.10. However, depending on the timing of the installation, specifically if the clay liner is constructed late in the excavation process, negligible incremental groundwater losses due to evaporation could occur under this Project alternative. See discussion in Section 4.5.2 above for more detail.

Land Use and Planning: Because the "Clay Liner Installation Alternative" would have the same footprint of disturbance (approximately 110 acres) and would not involve any changes to the land uses/land uses designations considered under the Project, this alternative would result in the same land use and planning impacts as those described for the Project in Section 3.11.

Noise: The "Clay Liner Installation Alternative" would result in the same noise impacts as those described for the Project in Section 3.13, except for the following:

- Installation of the clay liner, in lieu of the slurry wall, may require increased dragline and/or dewatering pump activity at the beginning of the excavation phase, and therefore additional noise impacts from dewatering equipment compared to the Project may result. However, the type, number, and operating hours of the excavation equipment is not expected to differ drastically from the Project, and therefore any increase in dragline/dewatering equipment noise for this Alternative is expected to be overall negligible. As a result, the "Clay Liner Installation Alternative" is expected to result in less than significant impacts.

Tribal Cultural Resources: Because the "Clay Liner Installation Alternative" would have the same footprint of disturbance (approximately 110 acres) and would reach the same final depth (60- to 80-feet below ground surface [bgs]) as the Project, the "Clay Liner Installation Alternative" would result in the same impacts to undiscovered tribal cultural resources as those described for the Project in Section 3.18. Additionally, implementation of this alternative would not change the tribal consultation process considered under the Project. Therefore, this alternative would result in the same impacts to tribal cultural resources as those described for the Project in Section 3.18.

Wildfire: The "Clay Liner Installation Alternative" would have the same footprint of disturbance (approximately 110 acres) as the Project and would not create and/or avoid any Project-related impacts to wildfire resources or related hazards. The "Clay Liner Installation Alternative" would result in the same wildfire impacts as those described for the Project in Section 3.20.

4.5.4 Summary of the Alternatives Analyzed

Table 4.5-1 provides a comparison of the environmental resource impacts of each Project alternative, when compared to the impacts disclosed for the Project throughout DEIR Section 3.0.

Table 4.5-1. Summary of Potential Impacts Before Mitigation

	No Project	Wet Excavation Method	Clay Liner Installation
Air Quality	Less	**More**	**More**
Biological Resources	Less	Similar	Similar
Cultural Resources	Less	Similar	Similar
Geology and Soils	Less	Similar	Similar
Greenhouse Gas Emissions	Less	**More**	**More**
Hazards and Hazardous Materials	Less	Similar	Similar
Hydrology and Water Quality	Less	**More**	**More**
Land Use and Planning	Similar	Similar	Similar
Noise	Less	**More**	**More**
Tribal Cultural Resources	Less	Similar	Similar
Wildfire	Less	Similar	Similar
Mandatory Findings of Significance	Similar	Similar	Similar

4.6 Environmentally Superior Alternative

The "No Project Alternative" is identified as the environmentally superior alternative. However, when the No Project Alternative is the environmentally superior alternative, CEQA requires that an EIR further identify an alternative other than the No Project Alternative as the environmentally superior alternative.

Under the "Wet Excavation Method", although certain short-term and temporary impacts early in the excavation phase, primarily air quality and noise, associated with construction of the slurry wall would be eliminated, long-term impacts associated with the use of a dragline and/or dewatering equipment is expected to increase air and greenhouse gas emissions and noise impacts when compared to the Project. Additionally, under the "Wet Excavation Method" there is an increased potential for groundwater loss through evaporation, as groundwater would be exposed throughout much of the excavation phase. Similar impacts may result if the "Clay Liner Alternative" were implemented; however, depending on the quality of the material extracted and the timing of the installation of the clay liner, certain impacts related

to air quality and slope stability may result. Thus, the TID determined that since the Wet Excavation Method and Clay Liner Installation Alternatives would potentially result in increased air quality, greenhouse gas, water quality, and noise impacts over those associated with the Proposed project, that the Project is the environmentally superior alternative.

Furthermore, implementation of the "Wet Excavation Method" and/or "Clay Liner Installation" alternatives do not necessarily guarantee the excavation pit remains dry throughout the entire excavation phase. WCSG has indicated that maintaining a dry excavation pit, as would occur with the installation of a slurry wall early in the excavation phase under the Project, would allow for the most operational efficiency. Although wet mining methods are feasible and have been used by WCSG in the past, these would most likely increase the operational costs and result in delays during reservoir excavation, which in turn may reduce the economic benefit (that is, royalties) received by TID to help offset the cost of reservoir construction.

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5.0 OTHER CEQA REQUIRED IMPACT ANALYSIS

This section includes consideration and discussion of other Project-related impacts that must be evaluated in the DEIR as described in CEQA Guidelines Section 15126.2 and Section 15130, including (1) cumulative impacts; (2) growth-inducing impacts; (3) summary of the Project impacts, including significant and unavoidable impacts; and (4) significant irreversible environmental changes.

5.1 Cumulative Impacts

5.1.1 CEQA Analysis Requirements

CEQA requires that impacts of cumulative projects be considered in the EIR. The project may have environmental effects that are individually limited, but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects and the effects of probable future projects (CEQA Guidelines § 15065(a)(3)).

The identification of reasonably foreseeable future projects is based on the standards of practicality and reasonableness. Reasonably foreseeable future projects include unapproved projects that were undergoing environmental review at the time that the Notice of Preparation (NOP) was submitted.

CEQA Guidelines Sections 15130(a) and (b) state:

(a) An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in Section 15065(a)(3). Where a Lead Agency is examining a project with an incremental effect that is not "cumulatively considerable," a Lead Agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

(1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the Lead Agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The Lead Agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The following elements are necessary to an adequate discussion of significant cumulative impacts:

(1) Either:

(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or

(B) A summary of projections contained in an adopted local, regional, or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.

5.1.2 Geographic Scope

The potential for Project-generated impacts to contribute to a significant cumulative impact would arise if the other projects are located within the same geographic area. This geographic area may vary, depending upon the issue and the geographic extent of the potential impact. For example, the geographic area associated with noise impacts would be limited to local areas directly affected by noise, whereas the geographic area that could be affected by air emissions may include the larger regional airshed as well as the local area.

5.1.3 Project Timing

In addition to the geographic scope, cumulative impacts are determined by timing of the other projects relative to the Project. For example, for a group of projects to generate cumulative construction impacts, they must be nearby projects that will occur approximately in the same timeframe. The related projects identified on Table 3-1 may or may not occur simultaneously with the Project, depending upon the schedule of each individual project. Although the timing of the projects is likely to fluctuate due to schedule changes or other unknown factors, this cumulative analysis assumes the identified related projects would be implemented concurrently with implementation of the Project.

5.1.4 Threshold of Significance

CEQA Guidelines Section 15355 defines cumulative impacts as "*two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.*" The Guidelines further state:

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

5.1.5 Description of Cumulative Projects and Cumulative Impacts

Table 3-1 provides a list and a brief summary of the projects that were evaluated in regards to potential cumulative impacts. The table also identifies whether the projects meet the criteria to be considered in the cumulative analysis and if so, what resources may be impacted. Of the eleven projects listed in Table 3-1, it was determined that none of the projects have the potential to generate cumulative effects when evaluated together with the McKay Point Reservoir Project. The projects considered include three industrial projects, two utility projects, three community plan updates, two commercial project, and one residential project. Three of the applicable projects considered are mining projects. Other than the Kaweah South Facility, none of the projects considered are operational. Two of the projects are currently inactive. One of the projects has completed the entitlement phase and is currently under construction. The remaining seven projects are in the permitting/entitlement/environmental review phases.

As discussed in Section 3.0 – Environmental Impact Analysis, specifically Table 3-1, none of the cumulative projects in the area meet the criteria to be considered in the cumulative analysis. Generally, cumulative projects within 1- to 3- miles of the Project site would be considered for the cumulative analysis. However, due to the lack of active and proposed potential cumulative projects identified by TID, the County and City of Woodlake near the McKay Point Project site, the geographical scope has been expanded beyond the typical 1-mile to 3-mile radius. Other than the three existing mining projects within the vicinity of the Project site, the remaining eight cumulative projects were located to far outside of the geographical criteria to be considered a potential cumulative project.

In addition to cumulative projects within the County and City of Woodlake, existing mining operations within the vicinity of the McKay Point site were also considered. CEMEX's Lemon Cove and related Stillwell facilities are located within 1-mile of the Project site; however, both facilities have been inactive since 2006, and will remain so into the foreseeable future.

Santa Fe Aggregates Facility, also known as the Seaborn Facility, is located within 1-mile of the Project site. As discussed throughout the DEIR, Santa Fe no longer operates at this facility, and this site is now idle. The Seaborn site is now owned by TID and their partners (Owners). West Coast Sand and Gravel's

(WCSG's) operations (e.g., production rate, truck traffic, etc.) during the Project's excavation phase, including processing of aggregate materials, would not exceed the processes (baseline) historically achieved at the adjacent Seaborn site. Because the Seaborn site is now inactive, and because the Project has been designed to not exceed historical operations at Seaborn, there would be no potential cumulative effects.

Lastly, the Kaweah South Facility is a mining operation located within 1-mile of the Project site. This facility is currently active, and would operate concurrently with the McKay Point Project. As discussed in Table 3-1, Kaweah South was previously analyzed under CEQA (i.e., EIR), assuming that the Santa Fe's Seaborn Facility would also be operating simultaneously. Because the Seaborn Facility has been purchased by the Owner's, and historical operations here have been attributed to the McKay Point Project and would not be exceeded, there would be no cumulative impacts, as the combined effects from the Kaweah South operations and the Project were already evaluated, accounted for, and properly mitigated within the Kaweah South EIR (SCH# 2002051039).

Please see Table 3-1 in Section 3.0 for the full list and a brief summary of the projects considered for the cumulative evaluation. Also see Figure 3-1, which identifies where each of the eleven projects identified on Table 3-1 and discussed above are located in relation to the Project.

5.2 Growth-Inducing Impacts

This section evaluates the potential for the Project to affect economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

There are two types of growth inducing impacts that a project may have: direct and indirect. To assess the potential for growth-inducing impacts, the Project's characteristics that may encourage and facilitate activities that individually or cumulatively affect the environment must be evaluated.

Direct growth inducing impacts occur when the development of a project imposes new burdens on a community by directly inducing population growth, or by leading to the construction of additional developments in the same area. Also included in this category are projects that remove physical obstacles to population growth, such as a new road into an undeveloped area or a wastewater treatment plant with excess capacity that could allow additional development in the service area. Construction of these types of infrastructure projects cannot be considered isolated from the development they facilitate and serve. Projects that physically remove obstacles to growth, or projects that indirectly induce growth are those, which may provide a catalyst for future unrelated development in an area such as a new residential community that requires additional commercial uses to support residents.

As discussed in Section 2.0 – Project Description of this document, the Project proposes to develop the approximately 110-acre McKay Point Reservoir on a 200-acre property. Once constructed, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. The

Project would not involve the development of residential land uses or infrastructure. Additionally, although aggregate and other building materials would be produced as a result of reservoir excavation, these materials would supplement existing regional aggregate supplies in direct response to the Tulare County region's demand for construction grade aggregates for infrastructure and other development projects. In other words, growth will occur whether or not the Project is implemented. Accordingly, the Project is not considered growth inducing, but rather growth dependent and will only respond to the existing and future needs of both TID's irrigation customers as well as WCSG's aggregate/construction industry customers. Therefore, implementation of the Project would not induce growth not already envisioned by the County of Tulare.

5.3 Summary of Impacts Including Significant and Unavoidable Impacts

The following provides a summary of the Project impacts, including significant and unavoidable impacts. A DEIR must disclose the significant and unavoidable impacts that will result from implementation of a proposed project. Moreover, CEQA Guidelines Section 15126.2(b) states that a Draft EIR should explain the implications of such impacts and the reasons why the project is being proposed, notwithstanding such impacts. Implementation of the Project would result in the alteration of the physical environment.

No Impact or Less Than Significant Impact

The Project has been determined through analysis in this EIR to have no impact or less than significant impact in the environmental resource areas listed below.

Aesthetics CEQA Guidelines Thresholds:

a) Would the Project have a substantial adverse effect on a scenic vista?

No Impact

b) Would the Project substantially damage scenic resources, including but not limited to trees, rock outcroppings and historic buildings within a state scenic highway?

No Impact

c) Would the Project in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). Would the project in an urbanized area conflict with applicable zoning and other regulations governing scenic quality?

No Impact

d) Would the Project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

No Impact

Agriculture and Forestry Resources CEQA Guideline Thresholds:

a) Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact

b) Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact

c) Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact

d) Would the Project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact

e) Would the Project involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland to non-agricultural use, or conversion of forest land to non-forest use?

No Impact

Air Quality CEQA Guidelines Thresholds:

a) Would the Project conflict with or obstruct implementation of an applicable air quality plan?

Impact AQ-1, Less Than Significant Impact

***c)* Would the Project expose sensitive receptors to substantial pollutant concentrations?**

Impact AQ-3, Less Than Significant Impact

d) Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impact AQ-4, Less Than Significant Impact

Biological Resources CEQA Guidelines Thresholds:

d) Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Impact BIO-4, Less Than Significant Impact

e) Would the Project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact BIO-5, Less Than Significant Impact

f) Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?

Impact BIO-6, No Impact

Energy CEQA Guidelines Thresholds:

a) Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

No Impact

b) Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact

Geology and Soils CEQA Guidelines Thresholds:

a) Would the Project directly or indirectly potential substantial adverse effects, including the risk of loss, injury, or death involving:

I. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zone Map issued by the State Geologist for the area or based on other substantial evidence of known fault;

II. Strong seismic ground shaking;

III. Seismic-related ground failure, including liquefaction; or

IV. Landslides? (Impact GS-1, Less Than Significant Impacts)

Impact GS-1, Less Than Significant Impact

b) Would the Project result in substantial soil erosion or the loss of topsoil?

Impact GS-2, Less Than Significant Impacts

c) Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Impact GS-3, Less Than Significant Impacts

d) Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Impact GS-4, Less Than Significant Impacts

e) Does the Project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Impact GS-5, No Impact

Greenhouse Gases/Climate Change CEQA Guidelines Thresholds:

a) Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Impact GHG-1, Less Than Significant Impacts

b) Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact GHG-2, Less Than Significant Impacts

Hazards and Hazardous Materials CEQA Guidelines Thresholds:

a) Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Impact HAZ-1, Less Than Significant Impacts

a) *Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

Impact HAZ-2, Less Than Significant Impacts

b) Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 miles of an existing or proposed school?

Impact HAZ-3, No Impact

c) Would the Project be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or environment?

Impact HAZ-4, No Impact

d) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?

Impact HAZ-5, Less Than Significant Impacts

e) Would the Project impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

Impact HAZ-6, Less Than Significant Impacts

f) Would the Project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Impact HAZ-7, Less Than Significant Impacts

Hydrology and Water Quality CEQA Guidelines Thresholds:

a) Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Impact HWQ-1, Less Than Significant Impacts

b) Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Impact HWQ 2, Less Than Significant Impacts

c) Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

I. result in substantial erosion or siltation on- or offsite;

II. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

III. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

IV. impede or redirect flood flows?

Impact HWQ-3, Less Than Significant Impacts

d) Would the Project if located in a flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Impact HWQ-4, Less Than Significant Impacts

e) Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact HWQ-5, Less Than Significant Impacts

Land Use and Planning CEQA Guidelines Thresholds:

a) Would the Project physically divide an established community?

Impact LUP-1, No Impact

b) Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Impact LUP-2, No Impact

Mineral Resources CEQA Guidelines Thresholds:

a) Result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state?

No Impact

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact

Noise and Vibration CEQA Guidelines Thresholds:

b) Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

Impact NO-2, Less Than Significant Impacts

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

Impact NO-3, No Impact

Population and Housing CEQA Guidelines Thresholds:

a) Would the Project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact

b) Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact

Public Services CEQA Guidelines Thresholds:

a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

I. Fire protection?

II. Police protection?

III. Schools?

IV. Parks?

V. Other public facilities?

No Impact

Recreation CEQA Guidelines Thresholds:

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact

Transportation CEQA Guidelines Thresholds:

a) Would the Project conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

No Impact

b) Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

No Impact

c) Would the Project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact

d) Would the Project result in inadequate emergency access?

No Impact

Tribal Cultural Resources CEQA Guidelines Thresholds:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

I. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or

II. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe? (Less Than Significant Impact)

Impact TCR-1, Less Than Significant Impacts

Utilities and Services CEQA Guidelines Thresholds:

a) Would the Project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

No Impact

b) Would the Project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact

c) Would the Project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact

d) Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

No Impact

e) Would the Project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact

Wildfire CEQA Guidelines Thresholds:

a) Would the Project Substantially impair an adopted emergency response plan or emergency evacuation plan?

Impact WI-1, Less Than Significant Impact

b) Would the Project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or uncontrolled spread of a wildfire?

Impact WI-2, Less Than Significant Impact

c) Would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Impact WI-3, Less Than Significant Impact

d) Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Impact WI-4, Less Than Significant Impact

Less Than Significant Impact after Mitigation

It has been determined through analyses provided in this EIR that the impacts in the following topical environmental resource areas can be feasibly mitigated below levels of significance:

Air Quality CEQA Guidelines Thresholds:

b) Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Impact AQ-2, Less Than Significant Impact with Mitigation

Biological Resources CEQA Guidelines Thresholds:

a) Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Impact BIO-1, Less Than Significant Impact with Mitigation

b) Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Impact BIO-2, Less Than Significant Impact with Mitigation

c) Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Impact BIO-3, Less Than Significant Impact with Mitigation

Cultural Resources CEQA Guidelines Thresholds:

a) Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Impact CUL-1, Less Than Significant Impact with Mitigation

b) Would the Project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Impact CUL-2, Less Than Significant Impact with Mitigation

c) Would the Project disturb any human remains, including those interred outside of dedicated cemeteries?

Impact CUL-3, Less Than Significant Impact with Mitigation

Geology and Soils CEQA Guidelines Thresholds:

f) Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (No Impact)

Impact GS-6, Less Than Significant Impact with Mitigation

Noise and Vibration CEQA Guidelines Thresholds:

a) Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Impact NO-1, Less Than Significant Impacts with Mitigation

5.4 Significant Irreversible Environmental Changes

CEQA Guidelines Section 15126.2(c) requires discussion of significant irreversible environmental changes which would be caused by the Project should it be implemented, for example, when a project includes future commitments to non-renewable resources during construction or operation. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

The environmental effects of the Project are discussed in Section 3.0 – Environmental Impact Analysis, of this document. Implementation of the Project would require the long-term commitment of natural resources as described below.

Mineral Resources

The State of California classified the Project site as MRZ-2 zone. MRZ-2 zones are areas where adequate information indicates that significant mineral deposits are present, or where it is judged that there is a high likelihood of their presence. Tulare County incorporated the MRZ-2 classification into the General Plan and Zoning/Code of Ordinances. Through the MRZ-2 designation, the State of California has also recognized the Project site and surrounding area as having construction grade aggregate deposits that are of regional significance.

The Project is the development of a water storage reservoir, where aggregate would be extracted from site in order to develop the reservoir basin as well as utilize the onsite mineral resource. While the aggregate/mineral resources removed and sold during the reservoir excavation phase is considered to be a non-renewable resource, this material would be used to meet the existing construction material needs of the Tulare County region.

Other Irreversible Changes

Approval and implementation of the Project would result in an irretrievable commitment of other non-renewable resources such as energy supplies. Specifically, non-renewable energy resources would be committed primarily in the form of fossil fuels, and would include diesel fuel, oil, natural gas, and gasoline used by vehicles and equipment associated with the construction/excavation and operation of the Project.

However, as described in Section 2.0 – Project Description, The Project would not result in an increase of employees or a change in the mining, processing and related operations that have historically occurred at the adjacent Seaborn Facility, other than relocating the operations to the adjacent McKay Point site. The energy consumption rates, including fossil fuels, for the Project would not change from what has historically been consumed by the Seaborn Facility, but the Project would extend these baseline operations for an additional 20+/- years. Additionally, the electrical services required for the aggregate processing plant/system would be obtained from the existing connection located along the northern boundary of the Project site, provided by Southern California Edison (SCE). Ultimately, during the reservoir excavation phase, the Project would provide a local source of aggregate to the region, minimizing the need to import aggregate from further away, thus reducing cumulative fuel consumption associated with transportation on a regional basis. Although the Project would consume a certain quantity of non-renewable fossil fuels onsite, the Project is expected to create a cumulative benefit by reducing the need to import aggregate from further away, thereby reducing potential fuel consumption.

Implementation of the Project (i.e., extraction of the reservoir basin and development of permanent water storage reservoir) would result in alterations to the physical environment. If the Project is approved, and subsequently implemented, new structures (e.g., reservoir facilities, concrete structures, etc.) would be built, additional utilities may be constructed (i.e., water well, electrical connection to the processing equipment), and onsite circulation improvements (i.e., perimeter access road) would be made to allow people and equipment to move throughout the Project site. However, the development of the Project is necessary and in direct response to the region's growing population and agricultural water supply needs. In other words, growth will occur in the Tulare County region whether or not the Project is implemented. As a direct result of the Project, available aggregate deposits will be mined and energy supplies will be used for extraction and reservoir construction activities, transportation of products and building equipment, and processing aggregate material. The commitment of resources and the levels of consumption associated with the Project are an appropriate allocation of said resources to ensure the reservoir can be constructed in an economically sound manner and that meets the needs of the Owners and the surrounding community.

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6.0 REPORT PREPARATION RESOURCES, ORGANIZATIONS & PERSONS CONSULTED

6.1 Draft EIR Prepared For

Tulare County Irrigation District
6826 Avenue 240
Tulare, California 93274

Tulare Irrigation District – Board of Directors

- David G. Bixler (Division 5)
- Richard S. Borges, Jr. (Division 4)
- Scott Rogers (Division 3)
- Dave Martin (Division 2)
- Michael Thomas (Division 1)

6.2 Draft EIR Prepared By

Sespe Consulting, Inc.
374 Poli Street, Suite 200
Ventura, California 93001

6.3 Technical Sub-Consultants

Applied EarthWorks, Inc.	Cultural Resources Investigation Paleontological Resource Assessment(s)
Sespe Consulting, Inc.	Noise Impact Assessment Air Quality, Health Risk, and Climate Change Impact Assessment Reclamation Plan Vehicle Miles Travelled (VMT) Analysis Letter
Bumgardner Biological Consulting	Biological Resources Report(s) Elderberry Inventory Report
SLR Consulting Limited/Hutchison Engineering, Inc.	Geology and Soils Technical Study Hydrology and Water Quality Technical Study
BSK Associates Engineering & Laboratories	Geotechnical Engineering Investigation Report
Associated Transportation Engineers	Traffic Technical Memorandum

6.4 Organizations and Persons Consulted

Tulare Irrigation District	Aaron Fukuda
West Coast Sand and Gravel	Dan Reyneveld
County of Tulare	Aaron Bock, Assistant Director – Economic Development & Planning Hector Guerra, Chief Planner – Environmental Planning Division Jessica Willis, Planner IV – Environmental Planning Division

7.0 REFERENCES

Applied EarthWorks, Inc. (2021). *Cultural Resource Investigation for the McKay Point Reservoir Project.* Fresno, CA: Applied EarthWorks, Inc.

Applied EarthWorks, Inc. (2021). *Paleontological Resource Assessment for the McKay Point Reservoir Project.* Pasadena, CA: Applied EarthWorks, Inc.

Bumgardner Biological Consulting. (2021). *McKay Point Reservoir Project Biological Resources Evaluation.* Gold River, CA: Bumgardner Biological Consulting.

Bureau of Land Management. (1986). *Visual Resources Management (VRM) Manual - Section 8400.* Bureau of Land Management, Department of the Interior. Washington DC: Bureau of Land Management. Retrieved from https://www.blm.gov/programs/recreation/recreation-programs/visual-resource-management

CalEPA. (2017, March 7). *Statewide Response to Climate Change.* Retrieved March 7, 2017, from California Climate Change: https://www.climatechange.ca.gov/state/mandates.html

California Air Resources Board. (2016, June 22). *Documentation of California's Greenhouse Gas Inventory*. Retrieved from California Air Resources Board: https://www.arb.ca.gov/cc/inventory/doc/docs1/1a1ai_importedelectricityunspecified_pacificsouthwest_electricitygeneration_unspecifiedsources_co2_2016.htm

California Department of Conservation. (1984). *Special Report 143 - Mineral Land Classification of the Greater Los Angeles Area.* Division of Mines and Geology. Sacramento, CA: California Department of Conservation. Retrieved from ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sr/SR_143/PartV/SR_143_PartV_Text.pdf

California Department of Conservation. (1987). *Designation of Regionally Significant Construction Aggregate Resource Areas in the Claremont-Upland and San Bernardino Production-Consumption Regions.* Division of Mines and Geology. Sacramento, CA: California Department of Conservation. Retrieved from https://www.conservation.ca.gov/smgb/reports/Documents/Designation_Reports/SMARA%20Designation%20Report%20No.%205.pdf

California Geological Survey. (2018). *Aggregate Sustainability in California.* Department of Conservation. Sacramento, CA: California Geological Survey. Retrieved from https://www.calcima.org/files/MS52_Ca_Ag_Report_201807.pdf

Caltrans. (2008). *Scenic Highway Guidelines.* California Department of Transportation, Division of Design. Sacramento, CA: Caltrans. Retrieved from http://www.dot.ca.gov/design/lap/livability/scenic-highways/docs/scenic_hwy_guidelines_04-12-2012.pdf

Caltrans. (2013). *Transportation and Construction Vibration Guidance Manual.* California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office. Sacramento, CA: Caltrans.

CARB. (2014, May 27). *2020 BAU Forecast.* Retrieved April 5, 2016, from 2020 Business-as-Usual (BAU) Emissions Projection 2014 Edition: http://www.arb.ca.gov/cc/inventory/data/tables/2020_bau_forecast_by_scoping_category_2014-05-22.pdf

CARB. (2016, June 17). *0F1FCalifornia Greenhouse Gas Emissions for 2000 to 2014 - Trends of Emissions and Other Indicators.* Retrieved February 27, 2017, from California Greenhouse Gas Emission Inventory - 2016 Edition: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

CARB. (2016, June 17). *Scoping Plan Categorization.* Retrieved February 27, 2017, from California Greenhouse Gas Emission Inventory - 2016 Edition: https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_00-14_20160509.xlsx

CARB. (2017, January 20). *The 2017 Climate Change Scoping Plan Update.* Retrieved May 1, 2017, from AB 32 Scoping Plan: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf

EPA. (1974). *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* U.S. Environmental Protection Agency. Washington, D.C. 20460: U.S. EPA. Retrieved 2017

EPA. (2013, March 22). *Clean Air Act in a Nutshell: How it Works.* Retrieved from https://www.epa.gov/sites/production/files/2015-05/documents/caa_nutshell.pdf

Federal Transit Administration. (2006). *Transit Noise and Vibration Impact Assessment.* Washington, DC: U.S. Department of Transportation.

Miller, R. V., & Busch, L. L. (1994). *Update of Mineral Land Classification for Portland Cement Concrete Grade Aggregate in the San Bernardino Production-Consumption Region, San Bernardino and Riverside Counties, California.* Department of Conservation. Sacramento, CA: California Geological Survey.

Norton, M., & Karczub, D. (2003). *Fundementals of Noise and Vibration Analysis for Engineers.* Cambridge, U.K.: Cambridge University Press.

OEHHA. (2004, June). *Recommendation for an Ambient Air Quality Standard for Ozone.* Retrieved May 13, 2016, from Review of the Ambient Air Quality Standard for Ozone: http://oehha.ca.gov/media/downloads/air/criteria-pollutant/ozonerec1.pdf

OEHHA. (2015, February). *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments.* Retrieved from http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html

OPR. (2000, October 26). Addressing Naturally Occuring Asbestos in CEQA Documents. *Memorandum: All CEQA Lead Agencies*. (C. &. CalDOC, Ed.) Sacramento, CA: State Clearinghouse.

Richards, J., & Brozell, T. (2007). *PM4 Crystalline Silica and PM10 Particulate Matter Emission Factors for Aggregate Producing Sources.* Coalition for the Responsible Regulation of Naturally Occurring Substances. Cary, NC: Air Control Techniques, P.C.

RWQCB - Central Valley Region. (2018). *Water Quality Control Plan for the Tulare Lake Basin Third Edition.* Sacramento, CA: RWQCB. Retrieved from https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlbp_201805.pdf

SCAQMD. (2008). *Board Agenda Item 31 - Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, Attachment A.* Retrieved June 4, 2019, from http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgattachmentsa_d.pdf

SCAQMD. (2014, December 12). *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Project.* Retrieved August 3, 2015, from Permit Project Documents - Year 2014: http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2014

SCAQMD. (2016, December 31). *Historical Data By Year*. Retrieved January 4, 2018, from South Coast AQMD: http://www.aqmd.gov/home/air-quality/air-quality-data-studies/historical-data-by-year

SCAQMD. (2016, February). *National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin*. Retrieved January 3, 2018, from AQMD: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf

SCAQMD. (2018, September). *2016 Air Quality Management Plan*. Retrieved January 2, 2018, from Clean Air Plans: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan

Sespe Consulting, Inc. (2020). *Air Quality, Health Risk, and Climate Change Impact Assessment.* Ventura, CA: Sespe Consulting, Inc.

Sespe Consulting, Inc. (2021). *Noise Impact Assessment - McKay Point Reservoir Project.* Ventura, CA: Sespe Consulting, Inc.

SLR. (2020). *Hydrology and Water Quality Technical Study.* Oakland, CA: SLR.

Southern California Association of Governments. (2019). *Profile of Unincorporated San Bernardino County - 2019.* Los Angeles, CA: Southern California Association of Governments. Retrieved 2019, from https://www.scag.ca.gov/Documents/UnIncAreaSanBernardinoCounty.pdf

TCAG. (2014). *Final Regional Housing Needs Plan for Tulare County 2014-2023.* Visalia, CA: Tulare County Association of Governments. Retrieved from https://tularecog.org/tcag/studies/regional-housing-needs-assessment-rhna/

Tulare County. (2012). *Tulare County General Plan - 2030 Update.* Visalia, CA: Tulare County. Retrieved from http://generalplan.co.tulare.ca.us/

Tulare County. (2020). *Tulare County Ordinance Code.* Visalia, CA: Tulare County. Retrieved from https://www.codepublishing.com/CA/TulareCounty/

U.S. Environmental Protection Agency. (2015). *Record of Decision - Newmark Groundwater Contamination Superfund Site Newmark and Muscoy Operable Units.* U.S. EPA. San Bernardino: U.S. EPA. Retrieved from https://semspub.epa.gov/work/09/2327009.pdf

U.S. EPA. (2013, November). *Greenhouse Gases Reporting Program Implementation.* Retrieved from https://www.epa.gov/sites/production/files/2014-09/documents/ghgrp-overview-factsheet.pdf

United States Census Bureau. (2019, August 27). *QuickFacts - San Bernardino County, CA*. Retrieved from www.census.gov: https://www.census.gov/quickfacts/fact/table/sanbernardinocountycalifornia,US/PST120218

US EPA. (1974). *Development of Emission Factors for Fugitive Dust Sources.*

Western Regional Climate Center. (1927-2005). *Western Regional Climate Center*. (wrcc@dri.edu, Editor) Retrieved 2019, from San Bernardino, CA (047723) - Climate Data Summary: https://wrcc.dri.edu/

8.0 ACRONYMS

AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
AC	Asphaltic Concrete
ACE	Agriculture Conservation Easement
ACM	Asbestos Containing Materials
AERMOD	American Meteorological Society/EPA Regulatory Model
AF	Acre-Foot
AMSL	Above Mean Sea Level
AOA	Air Operations Area
A-P Act	Alquist-Priolo Earthquake Fault Zoning Act
APCO	Air Pollution Control Officer
API	American Petroleum Institute
APN	Assessor Parcel Numbers
APSA	Aboveground Petroleum Storage Act
AQMP	Air Quality Management Plan
ARMR	Archaeological Resource Management Reports
ASF	Age Sensitivity Factors
AST	Aboveground Storage Tank
ATCM	Airborne Toxic Control Measure
ATCP	Air Toxics Control Plan
ATS	American Thoracic Society
BACT	Best Available Control Technology
BAU	Business-as-Usual
BGS	Below Ground Surface
BLM	Bureau of Land Management
BMPs	Best Management Practices
BNSF	Burlington Northern/Santa Fe
BPS	Best Performance Standards
BRE	Biological Resources Evaluation
BSA	Biological Study Area
CA SA	California Special Animal
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CAFÉ	Corporate Average Fuel Economy
CalARP	California Accidental Release Program
CalEMA	California Emergency Management Agency
CalEPA	California Environmental Protection Agency
Cal-IPC	California Invasive Plant Council
CalTrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAT	Climate Action Team

CBC	California Building Code
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CCP	Clean Communities Plan
CCR	California Code of Regulations
CDFG	California Department of Fish & Game
CDFW	California Department of Fish & Wildlife
CDPH	California Department of Public Health
CEC	California Energy Commission
CEIDARS	California Emission Inventory Development and Reporting System
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	California Fire Code
CFC	Chlorofuorocarbon
CFM	Cubic Feet per Minute
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System's
CMUTCD	California Manual on Uniform Traffic Control Devises for Streets and Highways
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
COG	Council of Governments
CPUC	California Public Utilities Commission
CSC	California Species of Special Concern
CUP	Conditional Use Permit
CUPA	Certified Unified Permitting Agencies
CVFPB	Central Valley Flood Protection Board
CWA	Clean Water Act
dBA	Decibels, A-weighted
DEIR	Draft Environmental Impact Report
DMG	Division of Mines and Geology
DOC	California Department of Conservation
DOF	California Department of Finance
DOT	Department of Transportation
DPM	Diesel Particulate Matter
DPR	California Department of Parks and Recreation
DSCM	Dry Standard Cubic Meter
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
EDB	Ethylene Dibromide (gasoline additive)
EIR	Environmental Impact Report
EMF's	Electromagnetic Fields
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act

ESA	Endangered Species Act
F	Fahrenheit
FAA	Federal Aviation Administration
FACE	Financial Assurance Cost Estimate
FAR	Federal Aviation Regulation
FC	Federal Candidate
FCAA	Federal Clean Air Act
FE	Federally Endangered (Species)
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FGC	Fish & Game Code
FHWA	Federal Highway Administration
FICON	Federal Interagency Commission of Noise
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FPE	Federally Proposed Endangered (Species)
FPPA	Farmland Protection Policy Act
FPT	Federally Proposed Threatened (Species)
FSZ	Farmland Security Zone
FT	Federally Threatened (Species)
FTA	Federal Transit Administration
FWS	Fish & Wildlife Service
GAMA	Groundwater Ambient Monitoring and Assessment
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse Gas
GIS	Geographical Information System
GLC	Ground Level Concentration
GPM	Gallons per Minute
GVWR	Gross Vehicle Weight Rating
GWP	Global Warming Potential
HAP	Hazardous Air Pollutants
HARP	Hot Spots Analysis and Reporting Program
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCM	Highway Capacity Manual
HCP	Habitat Conservation Plan
HFC	Hydrofluorocarbon
HHDT	Heavy-Heavy Duty Trucks
HI	Hazard Index
HMA	Hot Mix Asphalt
HMBP	Hazardous Materials Business Plan
Hp	Horse Power
HRA	Health Risk Assessment
HS	Health & Safety
HSC	California Health & Safety Code
HSWA	Hazardous and Solid Waste Amendments

HWCL	Hazardous Waste Control Law
Hz	Hertz
IC	Community Industrial
ICBO	International Conference of Building Officials
IDA	International Dark-Sky Association
IS	Initial Study
ITP	Incidental Take Permit
kW	Kilowatt
LBP	Lead-Based Paint
LCC	Land Capability Classification
LCFS	Low Carbon Fuel Standard
LDA	Light Duty Automobile
LESA	California Agricultural Land Evaluation and Site Assessment
LOS	Level of Service
LRA	Local Responsibility Area
LU	Land Use
MACT	Maximum Achievable Control Technology
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Levels
MEI	Maximally Exposed Individual
MHDT	Medium-Heavy Duty Trucks
MM	Mitigation Measure
MMRP	Mitigation Monitoring and Reporting Program
MMTons	Million Tons
MMTCOe	Million Metric Ton Carbon Dioxide Equivalent
MT	Metric Ton
MMBtu/hr	Million British Thermal Units per Hour
MMtpy	Million Tons per Year
MPG	Mile per Gallons
MPO	Metropolitan Planning Organizations
MRL	Method Reporting Limit
MRZ	Mineral Resource Zone
MS 52	Map Sheet 52
MSHA	Mine Safety and Health Administration
N_2O	Nitrous Oxide
NAAQS	National Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NCDC	National Climate Data Center
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NGO	Non-governmental Organization
NHTSA	National Highway Traffic Safety Administration
NMFSC	National Marine Fisheries Service Species of Concern
NMHC	Non-mehtan hydrocarbons
NO	Nitric Oxide
NO_2	Nitrogen Dioxide

NOA	Naturally Occurring Asbestos
NOC	Notice of Completion
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation
NOx	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Services
NSR	New Source Review
O_3	Ozone (Smog)
OEHHA	California EPA Office of Environmental Health Hazard Assessment
OES	California Office of Emergency Services
OLM	Ozone Limiting Method
OMR	Office of Mine Reclamation
ONAC	Federal Office of Noise Abatement and Control
ONC	Department of Health Services Office of Noise Control
OPR	Governor's Office of Planning & Research
OS	Open Space
OSHA	Occupational Safety and Health Act
OU	Operable Unit
P-C	Production-Consumption
Pb	Lead
PCB	Polychlorinated Biphenyl
PCC	Portland Cement Concrete
PCE	Perchloroethylene
PF	Public Facilities
PFC	Perfluorocarbon
PG&E	Pacific Gas & Electric
PGA	Peak Ground Acceleration
PM	Particulate Matter
PMI	Point of Maximum Impact
PPB	Parts per Billion
PPM	Parts per Million
PPV	Peak Particle Velocity
PRC	Public Resources Code
RAFSS	Riversidean alluvial fan sage scrub
RAP	Recycled Asphalt Product
RCRA	Resource Conservation and Recovery Act
RCS	Respirable Crystalline Silica
REL	Reference Exposure Level
RES	Renewable Electricity Standards
RFS	Renewable Fuel Standards
RMC	Ready-mix Concrete
ROG	Reactive Organic Gases
RPS	Renewal Portfolio Standard
RWQCB	Regional Water Quality Control Board

SARA	Superfund Amendments and Reauthorization Act
SARWQCB	Santa Ana Regional Water Quality Control Board
SCAB	South Coast Air Basin
SB	Senate Bill
SC	State Candidate (Species)
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SE	State Endangered (Species)
SEL	Sound Exposure Level
SF_6	Sulfur Hexaflouride
SFP	State Fully Protected (Species)
SIL	Significant Impact Level
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLAMS	State and Local Monitoring Stations
SMARA	Surface Mining Control & Reclamation Act
SMGB	State Mining and Geology Board
SMRP	Surface Mining and Reclamation Plan
SO_2	Sulfur Dioxide
SOI	Sphere of Influence
SOON	Surplus Off-Road Opt-In for NOx
SPCC	Spill Prevention, Control and Countermeasure Plan
SPRR	Southern Pacific Railroad
ST	State Threatened (Species)
SVOC	Semi-Volatile Organic Compounds
SWL	State Watch List (Species)
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TBACT	Toxic Best Available Control Technology
TCE	Trichloroethylene
TCP	Trichloropropane (solvent)
TI	Traffic Index
TNM	Traffic Noise Model
TOC	Total Organic Compounds
tpy	Tons per Year
TR	Transportation
TVP	True Vapor Pressure
UBC	Uniform Building Code
UMTA	Urban Mass Transit Administration
USACE	US Army Corp of Engineers
USEPA	US Environmental Protection Agency
USFWS	US Fish & Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank

UTM	Universal Transverse Mercador
VDE	Visible Dust Emissions
VELB	Valley Elderberry Longhorn Beetle
VIA	Visual Impact Analysis
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
VPD	Vehicles Per Day
VRM	Visual Resource Management
WCSG	West Coast Sand and Gravel
WDR	Waste Discharge Requirements
WSA	Water Supply Assessment

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APPENDIX A

Scoping Process Summary

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APPENDIX A-1

Scoping Comments, Mailing List, Presentation

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Commenters Received – TID Scoping Period

Date	Communication Method	Name	Company	Address	Phone
Individual Comments					
10/5/2020	Email	Barry Lindner	QK Inc.	901 East Main Street Visalia, CA 93292	Office: (559) 733-0440 Cell: (559) 991-8703
10/6/2020	Call	Bill Penzar	Lemon Cove Water Company	-----	-----
10/7/2020	Call/Email	Blanca Enciso	California Highway Patrol	-----	Office: (916) 843-3365
10/12/2020	Email	Tricia Stever Blattler	Tulare County Farm Bureau	737 N. Ben Maddox Way Visalia, CA 93292	Office: (559) 732-8301
10/13/2020	Email	John Kirkpatrick	Tulare County Resident	23114 Carson Avenue	Cell: (559) 901-1965
Scoping Meetings (10/15/2020 & 10/16/2020)					
10/15/2020	Call/WebEx	Shirley Kirkpatrick	Tulare County Resident	23114 Carson Avenue Exeter, CA 93221	-----
10/16/2020	Call/WebEx	Nancy Lang	Tulare County Property Owner	125 Carmel Street San Francisco, CA 94117	-----
10/16/2020	Call/WebEx	Mark Larsen	Kaweah Delta Water Conservation District	2975 Farmersville Road Farmersville, CA 93223	-----
10/16/2020	Call/WebEx	John Kirkpatrick	Tulare County Resident	23114 Carson Avenue Exeter, CA 93221	Cell: (559) 901-1965
Individual Comments					
10/20/2020	Letter/Email	James Herota	Central Valley Flood Protection Board (CVFPB)	3310 El Camino Avenue, Suite 170 Sacramento, CA 95821	Office: (916) 574-0609
10/21/2020 10/23/2020	Letter/Call/Email	Bill Pensar	Lemon Cove Sanitary District	-----	-----
10/26/2020	Email	Annette Tenneboe	California Department of Fish and Wildlife (CDFW)	1234 East Shaw Avenue Fresno, CA 93710	-----
10/27/2020	Email	John Kirkpatrick	Tulare County Resident	23114 Carson Avenue	-----

Date	Communication Method	Name	Company	Address	Phone
10/29/2020	Email	Tricia Stever Blattler	Tulare County Farm Bureau	737 N. Ben Maddox Way Visalia, CA 93292	Office: (559) 732-8301
Tulare County Farm Bureau Presentation (10/21/2020)					
10/21/2020	Presentation	Tricia Stever Blattler	Tulare County Farm Bureau (Executive Director)	737 N. Ben Maddox Way Visalia, CA 93292	Office: (559) 732-8301
10/21/2020	Presentation	Kurt Schmidt	UC Cooperative Extension	-----	-----
10/21/2020	Presentation	Greg Galloway		-----	-----
10/21/2020	Presentation	George Clausen	Tulare County Resident (lives north of the Lemon Cove Plant)	-----	-----
10/21/2020	Presentation	Byron Fox	Nancy Lang (lives near George Clausen)	-----	-----
10/21/2020	Presentation	Mile Gordon	-----	-----	-----
10/21/2020	Presentation	Craig Knudsen	-----	-----	-----
10/21/2020	Presentation	John Kirkpatrick	Tulare County Resident	23114 Carson Avenue	Cell: (559) 901-1965
Individual Comments					
11/1/2020	Letter	Nancy Lang	Tulare County Property Owner	125 Carmel Street San Francisco, CA 94117	-----
11/2/2020	Letter	Lorena Mendibles	Department of Transportation, District 6 Office	1352 West Olive Avenue P.O. Box 12616 Fresno, CA 93778-2616	Phone: (559) 445-5421 Fax: (559) 488-4088
11/2/2020	Letter	Patricia Fernandez	State Water Resources Control Board, Division of Water Rights	P.O. Box 2000 Sacramento, CA 95812-2000	(916) 319-9141
11/4/2020	Email	Tricia Stever Blattler	Tulare County Farm Bureau (Executive Director)	737 N. Ben Maddox Way Visalia, CA 93292	Office: (559) 732-8301
11/10/2020	Email(s)	Doug Reynolds	Teichert Materials	PO Box 515 Woodlake, CA 93286	Phone: (559) 967-2204
11/10/2020	Email	Michelle Cunningham	Teichert Materials	PO Box 515 Woodlake, CA 93286	Phone: (209) 765-2256

Date	Communication Method	Name	Company	Address	Phone
11/12/2020	Letter/Email	Julie A. Vance	California Department of Fish and Wildlife (CDFW)	1234 East Shaw Avenue Fresno, CA 93710	Phone: (559) 243-4014
12/1/20202	Letter	Rod A. Attebery	Neumiller & Beardslee	3121 W. March Lane, Suite 100 Stockton, CA 95219 P.O. Box 20 Stockton, CA 95201-3020	Phone: (209) 948-8200 Fax: (209) 9484910
12/1/20202	Letter	Dana Davis	Teichert Materials	-----	-----
12/1/20202	Letter	Doug Reynolds	Santa Fe Aggregates	-----	-----

NOP Tulare Irrigation District McKay Point Reservoir Record Request

Graham Stephens <gstephens@sespeconsulting.com>
Mon 10/5/2020 1:18 PM
To: Graham Stephens <gstephens@sespeconsulting.com>

From: Barry A. Lindner <Barry.Lindner@qkinc.com> A
Sent: Monday, October 5, 2020 8:47
To: Maya Rohr <mrohr@sespeconsulting.com>
Subject: NOP Tulare Irrigation District McKay Point Reservoir Record Request

HI Maya,
I would like to receive all public documents associated with this TID McKay Point Reservoir Project. Your name was listed in the Public Notice so reaching out to you.
Thank you.

Barry Lindner
Senior Project Manager
901 East Main Street
Visalia, CA 93292
(559) 733-0440 Office
(559) 991-8703 Cell
Barry.Lindner@qkinc.com
www.QKInc.com



Re: Lemon Cove Water Company

Aaron Fukuda <akf@tulareid.org>

Tue 10/6/2020 9:32 AM

To: Maya Rohr <mrohr@sespeconsulting.com>
Cc: John Hecht <jhecht@sespe.com>; Graham Stephens <gstephens@sespeconsulting.com>

Hi Maya,

I met with Bill a few years ago. He was very helpful by providing some information on the Lemon Cove well. That information should be in the file, but we may want to follow up with him to provide updated levels and maybe even some water quality. We will always have the folks that view this as a mining operation, however with TID and CPDC out in the lead we want them to understand we need the surface water storage and this is a means to get that.

Also, I am still trying to get water level data. I talked with Ken Schmidt and he said he will look around. I was also thinking we could ask the County for the annual reports from the surrounding mining operations. Should I reach out to the County and see if I can get the annual reports? Or do you have a way to get them?

Thanks

Aaron Fukuda
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274
Office: 559.686.3425
Cell: 559.707.8928

On Tue, Oct 6, 2020 at 9:26 AM Maya Rohr <mrohr@sespeconsulting.com> wrote:

> Aaron
>
> I received a call yesterday afternoon from Bill Penzar (not sure of spelling) from the Lemon Cove Water Company. His primary questions/comments were:
>
> - "Didn't we already do all this?"
> - "Have you considered the impact on their GW well across the river from the Project site?"
> - General questions regarding the aggregate processing location and changes. He was under the impression it would be going to the Kawaeh South Facility.
> - He is going to resubmit his letter that he sent during scoping last time – main concern being their well.
> - He shared that many folks look at the Project that this is a sneaky way to get another aggregate operation permitted. He did not feel that way. He thought it was a good

project as long as it does not impact his well.

I feel I addressed all his questions and he is personally fine with the Project. If you have any questions about the call / our discussion, just let me know.

Thanks

Maya

FW: Conformation of SCH number received

Maya Rohr <mrohr@sespeconsulting.com>

Wed 10/7/2020 2:12 PM

To: Graham Stephens <gstephens@sespeconsulting.com>; Aaron Fukuda <akf@tulareid.org>
Cc: John Hecht <jhecht@sespe.com>; Brian Anderson <banderson@sespeconsulting.com>

From: Enciso, Blanca@CHP <Blanca.Enciso@chp.ca.gov>
Sent: Wednesday, October 7, 2020 11:37
To: Maya Rohr <mrohr@sespeconsulting.com>
Subject: Conformation of SCH number received

Good morning Ms. Rohr,

Thank you for returning my call and providing SCH# 2014011078.

Have a wonderful day!

Kind regards,

Blanca Enciso
Special Projects Section-063
Transportation Planning Unit
California Highway Patrol
Office (916) 843-3365

Fw: TID McKay Point Project New NOP

Graham Stephens <gstephens@sespeconsulting.com>
Mon 10/12/2020 8:54 AM

To: Graham Stephens <gstephens@sespeconsulting.com>

---------- Forwarded message ---------

From: **Tricia Stever Blattler** <pstever@tulcofb.org>
Date: Mon, Oct 12, 2020 at 7:41 AM
Subject: Re: TID McKay Point Project New NOP
To: Aaron Fukuda <akf@tulareid.org>

Had a member reach out to me on this. I don't think I am on notifications for this any longer. Can you check?

Tricia Stever Blattler
Executive Director
Tulare County Farm Bureau
559-732-8301 office

> On Oct 11, 2020, at 7:26 PM, "jkirkpatrick@onemain.com" <jkirkpatrick@onemain.com> wrote:
>
> Tricia,
>
> A friend gave me a copy of the attached four page NOP for the McKay Point Project.
>
> I looked up the new 40 page NOP at the link referenced in the abbreviated NOP. There are a number of significant changes from the 74 page original NOP published in 2014. There was a scoping held in Woodlake as notified in the 2014 edition.
>
> The 2014 version comes up when one clicks into the brochure at the information page for Engineering & Capital Projects button at the TID URL! That will surely confuse some people.
>
> Was TCFB included in the Agency notification list for the new version of the NOP, i.e. did Sespi Consulting send this notice to the TCFB?
>
> A few years ago TID, via the office of Nancy Lockwood, requested a meeting concerning the McKay project with the TCFB LUC. I think the request was declined at that time.
>
> Regards,
>
> John Kirkpatrick
> <2020-10-10_201312 TID NOP 10-2-20.pdf>

Fw: TID NOP Question

Graham Stephens <gstephens@sespeconsulting.com>
Tue 10/20/2020 9:42 AM
To: Graham Stephens <gstephens@sespeconsulting.com>

From: jkirkpatrick@onemain.com <jkirkpatrick@onemain.com>
Sent: Tuesday, October 13, 2020 10:35 AM
To: Maya Rohr <mrohr@sespeconsulting.com>
Subject: FW: TID NOP Question

Maya,

My email box filled up after I sent the message forwarded here.

If you sent an “undelivered” reply, would you please send it again?

Will you please also add my name and email address to the interested parties list?

Thank you,

John Kirkpatrick
(559) 901-1965
jkirkpatrick@onemain.com
23114 Carson Ave
Exeter CA 93221-9744

From: jkirkpatrick@onemain.com [mailto:jkirkpatrick@onemain.com]
Sent: Tuesday, October 13, 2020 9:46 AM
To: 'mrohr@sespe.com'
Subject: TID NOP Question

Maya,

Is there available a listing of agencies and interested parties notified in connection with this NOP?

If yes, could you please send the list by return email?

Thank you,

John Kirkpatrick

jkirkpatrick@onemain.com

DocuSign Envelope ID: 4BBFF600-7C04-4D0E-BEFD-327C0D0695DD

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY **GAVIN NEWSOM,** GOVERNOR

CENTRAL VALLEY FLOOD PROTECTION BOARD
3310 El Camino Ave., Ste. 170
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682

October 13, 2020

Ms. Maya Rohr
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, California 92110

Subject: McKay Point Reservoir Project, Notice of Preparation, SCH No. 2014011078

Location: Tulare County

Dear Ms. Rohr,

Central Valley Flood Protection Board (Board) staff has reviewed the subject document and provides the following comments:

The proposed project is within the vicinity of the Kaweah River and St. Johns River, regulated streams under Board jurisdiction and may require a Board permit prior to construction.

The Board's jurisdiction covers the entire Central Valley including all tributaries and distributaries of the Sacramento and San Joaquin Rivers, and the Tulare and Buena Vista basins south of the San Joaquin River.

Under authorities granted by California Water Code and Public Resources Code statutes, the Board enforces standards set forth in California Code of Regulations, Title 23, Division 1 (Title 23) for the construction, maintenance, and protection of adopted plans of flood control, including the federal-State facilities of the State Plan of Flood Control, regulated streams, and designated floodways.

Pursuant to Title 23, Section 6 (a), a Board permit is required prior to working within the Board's jurisdiction for the placement, construction, reconstruction, removal, or abandonment of any landscaping, culvert, bridge, conduit, fence, projection, fill, embankment, building, structure, obstruction, encroachment, excavation, the planting, or removal of vegetation, and any repair or maintenance that involves cutting into the levee.

Board staff have reviewed the subject document and provides the following comments on the potential environmental effects within the Board's jurisdiction:

DocuSign Envelope ID: 4BBFF600-7C04-4D0E-BEFD-327C0D0695DD

Ms. Maya Rohr
October 13, 2020

Hydrologic Impacts

According to page 3 “To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet.
- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.”

An encroachment permit application may be required for the Project as it is located within the regulated streams including the Kaweah River and St. Johns River. An encroachment permit may also be required to include any existing works that predate permitting into compliance with Title 23, or where it is necessary to establish the conditions normally imposed by permitting. The circumstances include those where responsibility for the works has not been clearly established or ownership and use have been revised.

Other federal (including U.S. Army Corps of Engineers Section 10 and 404 regulatory permits), State and local agency permits may be required and are the applicant’s responsibility to obtain.

Board permit applications and Title 23 regulations are available on our website at http://www.cvfpb.ca.gov/. Maps of the Board’s jurisdiction are also available from the California Department of Water Resources website at http://gis.bam.water.ca.gov/bam/.

Encroachment permit applications received on or after July 1, 2019 are subject to fees, additional information is available on the Board’s website at http://cvfpb.ca.gov/fees-2019/.

Please contact James Herota at (916) 574-0651, or via email at James.Herota@CVFlood.ca.gov if you have any questions.

Sincerely,

Andrea Buckley

Andrea Buckley-
Environmental Services and Land Management Branch Chief

Cc: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

Fw: Comment letter - McKay Point Reservoir Project, Notice of Preparation, SCH No. 2014011078

Graham Stephens <gstephens@sespeconsulting.com>

Tue 10/20/2020 9:15 AM

To: Graham Stephens <gstephens@sespeconsulting.com>

4 attachments (807 KB)

ATT00001.htm; 2014011078 McKay Point Reservoir Project_10122020.pdf; ATT00002.htm; image003.png;

From: "Herota, James@CVFPB" <James.Herota@CVFlood.ca.gov>

Date: October 20, 2020 at 7:32:33 AM PDT
To: Maya Rohr <mrohr@sespeconsulting.com>, OPR State Clearinghouse <State.Clearinghouse@opr.ca.gov>
Cc: "Buckley, Andrea@CVFPB" <Andrea.Buckley@CVFlood.ca.gov>
Subject: Comment letter - McKay Point Reservoir Project, Notice of Preparation, SCH No. 2014011078

Greetings,

Please accept this electronic submission of the Central Valley Flood Protection Board – Responsible agency comments (enclosed) on the following project:

SCH Number: 2014011078
Lead Agency: Tulare Irrigation District
Document Title: McKay Point Reservoir Project
Type: Notice of Preparation

Please contact me if you have any questions.

Lemon Cove Water Company

Maya Rohr <mrohr@sespeconsulting.com>

Tue 10/6/2020 9:26 AM

To: Aaron Fukuda <akf@tulareid.org>
Cc: John Hecht <jhecht@sespe.com>; Graham Stephens <gstephens@sespeconsulting.com>

Aaron

I received a call yesterday afternoon from Bill Penzar (not sure of spelling) from the Lemon Cove Water Company. His primary questions/comments were:

- "Didn't we already do all this?"
- "Have you considered the impact on their GW well across the river from the Project site?"
- General questions regarding the aggregate processing location and changes. He was under the impression it would be going to the Kawaeh South Facility.
- He is going to resubmit his letter that he sent during scoping last time – main concern being their well.
- He shared that many folks look at the Project that this is a sneaky way to get another aggregate operation permitted. He did not feel that way. He thought it was a good project as long as it does not impact his well.

I feel I addressed all his questions and he is personally fine with the Project. If you have any questions about the call / our discussion, just let me know.

Thanks

Maya

Lemon Cove-TID Response Could You Lease Acknowledge Receipt- Thank You

Graham Stephens <gstephens@sespeconsulting.com>

Fri 10/23/2020 9:33 AM

To: Graham Stephens <gstephens@sespeconsulting.com>

2 attachments (3 MB)

TID NOP.pdf; ATT00001.htm;

> **From:** bill pensar <pensar3@netzero.com>
> **Date:** October 21, 2020 at 7:42:22 PM PDT
> **To:** Maya Rohr <mrohr@sespeconsulting.com>
> **Subject: Lemon Cove-TID Response Could You Lease Acknowledge Receipt- Thank You**

Lemon Cove Sanitary District
Lemon Cove Water
P. O. Box 44374
Lemon Cove, CA 93244

Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

RE: NOTICE OF PREPARATION FOR McKAY POINT RESERVOIR PROJECT

Regarding the request for input on the above referenced N.O.P., the Board of the Lemon Cove Sanitary District appreciates receiving notice and being given the opportunity to express our views on the scope of the study for the proposed project.

The County of Tulare and the Lemon Cove Sanitary District/Lemon Cove Water Co. operate a jointly held water system which has a well sited on a parcel located less than 800 feet south of your proposed project. That well is the sole source of water for the community of Lemon Cove. Needless to say, we are concerned. We would appreciate further investigation into any potential impacts on the quality and quantity of our source, and serious consideration given to mitigation measures, as needed, to maintain same. It is hoped that the same requirements of SMARA will be afforded to this iteration of the project, as we also have some concerns regarding failure to complete. Should the project be started and not completed, or otherwise be stalled, what safe guards will be put in place to restore or remediate the site?

Thank you for your consideration. You may telephone (559)597-2504 if necessary.

Michael Lampman
President, Board of Directors

William F. Pensar
Secretary, Board of Directors

Fw: Lemon Cove- Water Consumption Data Will Follow Soon

Graham Stephens <gstephens@sespeconsulting.com>

Mon 10/26/2020 8:21 AM

To: Graham Stephens <gstephens@sespeconsulting.com>

2 attachments (5 MB)

DocsVI_1940146.pd fgeneral physical.pdf; WELL LOG MCKAY POINT.pdf;

---------- Forwarded message ---------
From: **bill pensar** <pensar3@netzero.com>
Date: Fri, Oct 23, 2020, 5:53 PM
Subject: Lemon Cove- Water Consumption Data Will Follow Soon
To: <akf@tulareid.org>

Top News - Sponsored By Newser

- **First US Nest of Murder Hornets Found, Thanks to Dental Floss**
- **County Hit by Surge Ends Mask Mandate**
- **Biden's Oil Remarks Are Resonating**

February 12, 2019

Lemon Cove Water/Sanitary Dist.
P.O. Box 44374
Lemon Cove, CA 93244-0374

Lab ID : VI 1940146
Customer : 4-11120

Laboratory Report

Introduction: This report package contains total of 10 pages divided into 3 sections:

Case Narrative	(2 pages)	: An overview of the work performed at FGL.
Sample Results	(2 pages)	: Results for each sample submitted.
Quality Control	(6 pages)	: Supporting Quality Control (QC) results.

Case Narrative

This Case Narrative pertains to the following samples:

Sample Description	Date Sampled	Date Received	FGL Lab ID #	Matrix
STW-1	01/14/2019	01/14/2019	VI 1940146-001	DW

Sampling and Receipt Information: The sample was performed by FGL using the following methods (where applicable):

Bacteriological Sampling	- SOP:200900141
Grab sampling for liquids	- SOP:200900137
Composite sampling for liquids	- SOP:200900139
Grab sampling for solids	- SOP:200900142
Composite sampling for solids	- SOP:200900143

All samples were received, prepared and analyzed within the method specified holding times. All samples arrived on ice. All samples were checked for pH if acid or base preservation is required (except for VOAs). For details of sample receipt information, please see the attached Chain of Custody and Condition Upon Receipt Form.

Quality Control: All samples were prepared and analyzed according to the following tables:

Inorganic - Metals QC

200.7	01/16/2019:200755 All analysis quality controls are within established criteria
	01/16/2019:200565 All preparation quality controls are within established criteria
200.8	01/18/2019:200928 All analysis quality controls are within established criteria
	01/18/2019:200654 All preparation quality controls are within established criteria

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2063
CA ELAP Certification No. 1573

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)783-2912
CA ELAP Certification No. 2775

Office & Laboratory
9415 W. Goshen Avenue
Visalia, CA 93291
TEL: (559)734-9473
FAX: (559)734-8435
CA ELAP Certification No. 2810

February 12, 2019 Lab ID : VI 1940146
Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Inorganic - Metals QC

245.1	01/25/2019:201214 All analysis quality controls are within established criteria
	01/25/2019:200890 All preparation quality controls are within established criteria

Inorganic - Wet Chemistry QC

2130B	01/15/2019:200986 All analysis quality controls are within established criteria
	01/15/2019:200736 All preparation quality controls are within established criteria
2150B	01/14/2019:410022 All preparation quality controls are within established criteria
2320B	01/16/2019:200782 All analysis quality controls are within established criteria
	01/16/2019:200558 All preparation quality controls are within established criteria
2510B	01/16/2019:200694 All analysis quality controls are within established criteria
	01/16/2019:200524 All preparation quality controls are within established criteria
2540CE	01/16/2019:200553 All preparation quality controls are within established criteria
300.0	01/15/2019:200740 All analysis quality controls are within established criteria
	01/15/2019:200552 All preparation quality controls are within established criteria
5540C	01/16/2019:200974 All analysis quality controls are within established criteria
	01/16/2019:200729 All preparation quality controls are within established criteria

Certification:: I certify that this data package is in compliance with ELAP standards, both technically and for completeness, except for any conditions listed above. Release of the data contained in this data package is authorized by the Laboratory Director or his designee, as verified by the following electronic signature.

KD:DMB

Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S.
Title: Laboratory Director
Date: 2019-02-12

INORGANIC CHEMICALS ANALYSIS

Date of Report : February 12, 2019
Laboratory Name : **FGL Environmental**
Sampled On : 01/14/2019-10:10
Received On : 01/14/2019-12:05
Completed On : 01/25/2019

Sample ID : VI 1940146-001
Approved By **Kelly A. Dunnahoo, B.S.** Digitally signed by Kelly A. Dunnahoo, B.S. Title: Laboratory Director Date: 2019-02-12
Sampler : Jacob Salinas
Employed By : FGL Environmental

System Name : LEMON COVE WATER CO Number : 5400616-001 **EDT**

Name Or Number of Sample Source : WELL 01 - MC KAY S POINT

User ID : CYA
Date/Time of Sample : 1901141010 YYMMDDTTTT
Submitted By : **FGL Environmental**

Station Number : 5400616-001
Laboratory Code : 5 8 6 7
Phone # : (805) 392-2000

GENERAL MINERAL & PHYSICAL

MCL	UNITS	CHEMICALS	ENTRY	RESULT	DLR
	mg/L	Total Hardness (as CaCO3)	00900	346	1
	mg/L	Calcium (Ca)	00916	94	1
	mg/L	Magnesium (Mg)	00927	27	1
	mg/L	Sodium (Na)	00929	37	1
	mg/L	Potassium (K)	00937	4	1
	meq/L	Total Cations		8.6	
	mg/L	Total Alkalinity (as CaCO3)	00410	210	10
	mg/L	Hydroxide (OH)	71830	ND	10
	mg/L	Carbonate (CO3)	00445	ND	10
	mg/L	Bicarbonate (HCO3)	00440	250	10
* [2]	mg/L	Sulfate (SO4)	00945	160	0.5
* [2]	mg/L	Chloride (Cl)	00940	25	1
45	mg/L	Nitrate (NO3)	71850	75.1	2
2	mg/L	Fluoride (F)	00951	0.2	0.1
	meq/L	Total Anions		9.4	
	Std Units	pH	00403	7.5	
** [2]	umhos/cm2	Specific Conductance (E.C.)	00095	893	1
*** [2]	mg/L	Total Filterable Residue	70300	600	40
3 [2]	TON	Odor Threshold at 60 °C	00086	ND	1
5	NTU	Lab Turbidity	82079	0.3	0.1

MCL - Maximum Contaminant Level, DLR -Detection Limit for Reporting Purpose, ND - Not Detected at or above DLR
[2] Indicates Secondary Drinking Water Standards(Recommended-Upper-Short Term) * 250-500-600 ** 900-1600-2200 *** 500-1000-1500

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CA ELAP Certification No. 2670

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San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)783-2912
CA ELAP Certification No. 2775

Office & Laboratory
9415 W. Goshen Avenue
Visalia, CA 93291
TEL: (559)734-9473
FAX: (559)734-8435
CA ELAP Certification No. 2810

GENERAL MINERAL & PHYSICAL

MCL	UNITS	CHEMICALS	ENTRY	RESULT	DLR
0.5 [2]	mg/L	MBAS	38260	ND	0.05

REGULATED INORGANIC

MCL	UNITS	CHEMICALS	ENTRY	RESULT	DLR
1000	ug/L	Aluminum	01105	ND	50
6	ug/L	Antimony	01097	ND	6
10	ug/L	Arsenic	01002	ND	2
1000	ug/L	Barium	01007	102	100
4	ug/L	Beryllium	01012	ND	1
5	ug/L	Cadmium	01027	ND	1
50	ug/L	Chromium (Total Cr)	01034	ND	10
1000 [2]	ug/L	Copper	01042	ND	50
300 [2]	ug/L	Iron	01045	ND	100
15	ug/L	Lead	01051	ND	5
50 [2]	ug/L	Manganese	01055	ND	20
2	ug/L	Mercury	71900	ND	1
100	ug/L	Nickel	01067	ND	10
50	ug/L	Selenium	01147	ND	5
100 [2]	ug/L	Silver	01077	ND	10
2	ug/L	Thallium	01059	ND	1
	ug/L	Zinc	01092	ND	50

ADDITIONAL INORGANIC

MCL	UNITS	CHEMICALS	ENTRY	RESULT	DLR
---	ug/L	Boron	01020	ND	100
		Langelier Index at 20 °C	71814	0.3	
10	mg/L	Nitrate as N (Nitrogen)	00618	17.0	0.4
10	mg/L	Nitrate + Nitrite as N	A-029	17.0	0.2
1	mg/L	Nitrite as N (Nitrogen)	00620	ND	0.4
	mg/L	Sodium Adsorption Ratio (SAR)	00931	0.9	1
---	ug/L	Vanadium	01087	29	3
		Aggressiveness Index	82383	12.2	

MCL - Maximum Contaminant Level, DLR -Detection Limit for Reporting Purpose, ND - Not Detected at or above DLR
[2] Indicates Secondary Drinking Water Standards(Recommended-Upper-Short Term)

February 12, 2019 Lab ID : VI 1940146
Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Boron	200.7	(STK1930539-001)	MS	mg/L	4.000	107 %	75-125	
			MSD	mg/L	4.000	109 %	75-125	
			MSRPD	mg/L	800.0	1.6%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	5.000	96.4 %	90-110	
			CCB	ppm		0.003	0.1	
			CCV	ppm	5.000	97.0 %	90-110	
			CCB	ppm		0.014	0.1	
Calcium	200.7	(STK1930539-001)	MS	mg/L	12.00	83.3 %	75-125	
			MSD	mg/L	12.00	88.1 %	75-125	
			MSRPD	mg/L	800.0	0.7%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	25.00	99.6 %	90-110	
			CCB	ppm		0.02	1	
			CCV	ppm	25.00	99.8 %	90-110	
			CCB	ppm		0.02	1	
Copper	200.7	(STK1930539-001)	MS	ug/L	800.0	103 %	75-125	
			MSD	ug/L	800.0	104 %	75-125	
			MSRPD	ug/L	800.0	1.7%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	1.000	96.8 %	90-110	
			CCB	ppm		0.0010	0.01	
			CCV	ppm	1.000	96.2 %	90-110	
			CCB	ppm		0.0002	0.01	
Iron	200.7	(STK1930539-001)	MS	ug/L	4000	101 %	75-125	
			MSD	ug/L	4000	104 %	75-125	
			MSRPD	ug/L	800.0	2.9%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	5.000	95.1 %	90-110	
			CCB	ppm		0.0023	0.03	
			CCV	ppm	5.000	95.0 %	90-110	
			CCB	ppm		-0.0040	0.03	
Magnesium	200.7	(STK1930539-001)	MS	mg/L	12.00	94.4 %	75-125	
			MSD	mg/L	12.00	98.6 %	75-125	
			MSRPD	mg/L	800.0	1.2%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	25.00	100 %	90-110	
			CCB	ppm		0.004	1	
			CCV	ppm	25.00	100 %	90-110	
			CCB	ppm		0.004	1	
Manganese	200.7	(STK1930539-001)	MS	ug/L	800.0	103 %	75-125	
			MSD	ug/L	800.0	106 %	75-125	
			MSRPD	ug/L	800.0	2.5%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	1.000	99.4 %	90-110	
			CCB	ppm		-0.0006	0.01	
			CCV	ppm	1.000	99.3 %	90-110	
			CCB	ppm		0.0003	0.01	
Potassium	200.7	(STK1930539-001)	MS	mg/L	12.00	103 %	75-125	
			MSD	mg/L	12.00	106 %	75-125	
			MSRPD	mg/L	800.0	1.9%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	25.00	96.5 %	90-110	
			CCB	ppm		-0.11	1	
			CCV	ppm	25.00	95.3 %	90-110	
			CCB	ppm		-0.11	1	
Sodium	200.7	(STK1930539-001)	MS	mg/L	12.00	88.0 %	75-125	
			MSD	mg/L	12.00	94.5 %	75-125	
			MSRPD	mg/L	800.0	1.2%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	25.00	95.5 %	90-110	
			CCB	ppm		-0.14	1	
			CCV	ppm	25.00	94.6 %	90-110	

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February 12, 2019 Lab ID : VI 1940146
Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Sodium	200.7	01/16/19:200755AC	CCB	ppm		-0.17	1	
Zinc	200.7	(STK1930539-001)	MS	ug/L	800.0	95.3 %	75-125	
			MSD	ug/L	800.0	97.8 %	75-125	
			MSRPD	ug/L	800.0	1.7%	≤20.0	
	200.7	01/16/19:200755AC	CCV	ppm	1.000	94.2 %	90-110	
			CCB	ppm		-0.0006	0.02	
			CCV	ppm	1.000	97.1 %	90-110	
			CCB	ppm		-0.0007	0.02	
Aluminum	200.8	(STK1930724-001)	MS	ug/L	5.000	98.7 %	75-125	
			MSD	ug/L	5.000	94.4 %	75-125	
			MSRPD	ug/L	5.000	0.21	≤10	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	93.9 %	90-110	
			ICB	ppb		-0.01	10	
			CCV	ppb	120.0	95.2 %	90-110	
			CCB	ppb		-0.02	10	
Antimony	200.8	(STK1930724-001)	MS	ug/L	5.000	113 %	75-125	
			MSD	ug/L	5.000	110 %	75-125	
			MSRPD	ug/L	5.000	3.2%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	102 %	90-110	
			ICB	ppb		0.23	1	
			CCV	ppb	120.0	103 %	90-110	
			CCB	ppb		0.01	1	
Arsenic	200.8	(STK1930724-001)	MS	ug/L	5.000	108 %	75-125	
			MSD	ug/L	5.000	107 %	75-125	
			MSRPD	ug/L	5.000	0.4%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	98.8 %	90-110	
			ICB	ppb		0.02	1	
			CCV	ppb	120.0	99.4 %	90-110	
			CCB	ppb		0.02	1	
Barium	200.8	(STK1930724-001)	MS	ug/L	5.000	108 %	75-125	
			MSD	ug/L	5.000	116 %	75-125	
			MSRPD	ug/L	5.000	0.3%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	99.5 %	90-110	
			ICB	ppb		-0.005	0.2	
			CCV	ppb	120.0	99.9 %	90-110	
			CCB	ppb		0.003	0.2	
Beryllium	200.8	(STK1930724-001)	MS	ug/L	5.000	101 %	75-125	
			MSD	ug/L	5.000	96.9 %	75-125	
			MSRPD	ug/L	5.000	0.21	≤1	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	94.9 %	90-110	
			ICB	ppb		0.037	0.2	
			CCV	ppb	120.0	94.8 %	90-110	
			CCB	ppb		0.018	0.2	
Cadmium	200.8	(STK1930724-001)	MS	ug/L	5.000	107 %	75-125	
			MSD	ug/L	5.000	105 %	75-125	
			MSRPD	ug/L	5.000	1.6%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	98.9 %	90-110	
			ICB	ppb		-0.002	0.2	
			CCV	ppb	120.0	99.8 %	90-110	
			CCB	ppb		-0.004	0.2	
Chromium	200.8	(STK1930724-001)	MS	ug/L	5.000	105 %	75-125	
			MSD	ug/L	5.000	91.3 %	75-125	
			MSRPD	ug/L	5.000	7.9%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	96.0 %	90-110	

February 12, 2019 Lab ID : VI 1940146
Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Metals								
Chromium	200.8	01/18/19:200928AC	ICB	ppb		-0.01	1	
			CCV	ppb	120.0	95.2 %	90-110	
			CCB	ppb		0.01	1	
Lead	200.8		MS	ug/L	5.000	103 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	99.8 %	75-125	
			MSRPD	ug/L	5.000	2.7%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	94.0 %	90-110	
			ICB	ppb		-0.027	0.5	
			CCV	ppb	120.0	94.1 %	90-110	
			CCB	ppb		-0.036	0.5	
Nickel	200.8		MS	ug/L	5.000	104 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	99.5 %	75-125	
			MSRPD	ug/L	5.000	4.3%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	101 %	90-110	
			ICB	ppb		-0.02	1	
			CCV	ppb	120.0	99.1 %	90-110	
			CCB	ppb		-0.01	1	
Selenium	200.8		MS	ug/L	5.000	114 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	110 %	75-125	
			MSRPD	ug/L	5.000	3.1%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	99.9 %	90-110	
			ICB	ppb		0.10	1	
			CCV	ppb	120.0	101 %	90-110	
			CCB	ppb		0.05	1	
Silver	200.8		MS	ug/L	5.000	78.7 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	78.4 %	75-125	
			MSRPD	ug/L	5.000	0.013	≤1	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	94.6 %	90-110	
			ICB	ppb		0.003	1	
			CCV	ppb	120.0	94.7 %	90-110	
			CCB	ppb		-0.003	1	
Thallium	200.8		MS	ug/L	5.000	102 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	100 %	75-125	
			MSRPD	ug/L	5.000	2.0%	≤20	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	94.4 %	90-110	
			ICB	ppb		0.023	0.2	
			CCV	ppb	120.0	94.6 %	90-110	
			CCB	ppb		0.01	0.2	
Vanadium	200.8		MS	ug/L	5.000	100 %	75-125	
		(STK1930724-001)	MSD	ug/L	5.000	93.3 %	75-125	
			MSRPD	ug/L	5.000	0.33	≤2	
	200.8	01/18/19:200928AC	ICV	ppb	120.0	94.2 %	90-110	
			ICB	ppb		-0.005	2	
			CCV	ppb	120.0	93.4 %	90-110	
			CCB	ppb		0.004	2	
Mercury	245.1	01/25/19:200890AC	Blank	ug/L		ND	<0.02	
			LCS	ug/L	0.2000	98.8 %	85-115	
			MS	ug/L	0.2000	93.4 %	75-125	
		(CC 1980038-001)	MSD	ug/L	0.2000	91.7 %	75-125	
			MSRPD	ug/L	0.2000	1.7%	≤20	
	245.1	01/25/19:201214AC	ICV	ppt	200.0	90.7 %	90-110	
			ICB	ppt		0.1	20	
			CCV	ppt	200.0	98.4 %	90-110	
			CCB	ppt		0.1	20	

February 12, 2019 Lab ID : VI 1940146
Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Turbidity	2130B	(SP 1900572-002)	Dup	NTU		1.2%	20	
	2130B	01/15/19:200986JBA	CCV	NTU	10.00	109 %	90-110	
			CCB	NTU		0.099	0.1	
			CCV	NTU	10.00	109 %	90-110	
			CCB	NTU		0.098	0.1	
Odor	2150B	(VI 1940146-001)	Dup	TON		0.0	1	
Alkalinity (as CaCO3)	2320B	(SP 1900623-001)	Dup	mg/L		0.9%	10	
	2320B	01/16/19:200782AMM	CCV	mg/L	234.9	94.0 %	90-110	
			CCV	mg/L	234.9	97.6 %	90-110	
Bicarbonate	2320B	(SP 1900623-001)	Dup	mg/L		0.9%	10	
Carbonate	2320B	(SP 1900623-001)	Dup	mg/L		0.0	10	
Hydroxide	2320B	(SP 1900623-001)	Dup	mg/L		0.0	10	
Conductivity	2510B	01/16/19:200694JMG	ICB	umhos/cm		0.25	1	
			CCV	umhos/cm	999.0	104 %	95-105	
			CCV	umhos/cm	999.0	104 %	95-105	
E. C.	2510B	01/16/19:200524jmg	Blank	umhos/cm		ND	<1	
		(SP 1900643-021)	Dup	umhos/cm		0.3%	5	
Total Dissolved Solids (TFR)	2540CE	01/16/19:200553CTL	Blank	mg/L		ND	<20	
			LCS	mg/L	993.1	98.0 %	90-110	
		(SP 1900643-005)	Dup	mg/L		1.5%	5	
		(SP 1900643-009)	Dup	mg/L		0.07%	5	
Chloride	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<1	
			LCS	mg/L	25.00	101 %	90-110	
			MS	mg/L	500.0	105 %	85-121	
		(STK1930317-002)	MSD	mg/L	500.0	106 %	85-121	
			MSRPD	mg/L	100.0	1.6%	≤19	
			MS	mg/L	500.0	104 %	85-121	
		(VI 1940096-001)	MSD	mg/L	500.0	104 %	85-121	
			MSRPD	mg/L	100.0	0.02%	≤19	
	300.0	01/15/19:200740MCA	CCB	ppm		0.09	1	
			CCV	ppm	25.00	101 %	90-110	
			CCB	ppm		0.05	1	
			CCV	ppm	25.00	101 %	90-110	
Fluoride	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.1	
			LCS	mg/L	2.500	105 %	90-110	
			MS	mg/L	50.00	104 %	87-120	
		(STK1930317-002)	MSD	mg/L	50.00	106 %	87-120	
			MSRPD	mg/L	100.0	2.0%	≤16	
			MS	mg/L	50.00	103 %	87-120	
		(VI 1940096-001)	MSD	mg/L	50.00	103 %	87-120	
			MSRPD	mg/L	100.0	0.2%	≤16	
	300.0	01/15/19:200740MCA	CCB	ppm		0.000	0.1	
			CCV	ppm	2.500	105 %	90-110	
			CCB	ppm		0.000	0.1	
			CCV	ppm	2.500	106 %	90-110	
Nitrate	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.4	
			LCS	mg/L	20.00	102 %	90-110	
			MS	mg/L	400.0	103 %	85-119	
		(STK1930317-002)	MSD	mg/L	400.0	105 %	85-119	
			MSRPD	mg/L	100.0	1.6%	≤19	
			MS	mg/L	400.0	103 %	85-119	
		(VI 1940096-001)	MSD	mg/L	400.0	103 %	85-119	
			MSRPD	mg/L	100.0	0.01%	≤19	
	300.0	01/15/19:200740MCA	CCB	ppm		0.000	0.5	

February 12, 2019 Lab ID : VI 1940146

Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Constituent	Method	Date/ID	Type	Units	Conc.	QC Data	DQO	Note
Wet Chem								
Nitrate	300.0	01/15/19:200740MCA	CCV	ppm	20.00	103 %	90-110	
			CCB	ppm		0.027	0.5	
			CCV	ppm	20.00	103 %	90-110	
Nitrate + Nitrite as N	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.1	
Nitrate Nitrogen	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.1	
Nitrite	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	15.00	101 %	90-110	
			MS	mg/L	300.0	103 %	74-126	
		(STK1930317-002)	MSD	mg/L	300.0	105 %	74-126	
			MSRPD	mg/L	100.0	1.8%	≤20	
			MS	mg/L	300.0	103 %	74-126	
		(VI 1940096-001)	MSD	mg/L	300.0	103 %	74-126	
			MSRPD	mg/L	100.0	0.1%	≤20	
	300.0	01/15/19:200740MCA	CCB	ppm		0.000	0.5	
			CCV	ppm	15.00	102 %	90-110	
			CCB	ppm		0.000	0.5	
			CCV	ppm	15.00	102 %	90-110	
Nitrite Nitrogen	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.2	
Sulfate	300.0	01/15/19:200552MCA	Blank	mg/L		ND	<0.5	
			LCS	mg/L	50.00	100 %	90-110	
			MS	mg/L	1000	103 %	82-124	
		(STK1930317-002)	MSD	mg/L	1000	106 %	82-124	
			MSRPD	mg/L	100.0	2.3%	≤23	
			MS	mg/L	1000	103 %	82-124	
		(VI 1940096-001)	MSD	mg/L	1000	103 %	82-124	
			MSRPD	mg/L	100.0	0.3%	≤23	
	300.0	01/15/19:200740MCA	CCB	ppm		0.019	0.5	
			CCV	ppm	50.00	100 %	90-110	
			CCB	ppm		0.031	0.5	
			CCV	ppm	50.00	101 %	90-110	
MBAS	5540C	01/16/19:200974AMM	CCB	mg/L		-0.0144	0.25	
			CCV	mg/L	1.000	107 %	90-110	
			CCB	mg/L		-0.0144	0.25	
			CCV	mg/L	1.000	109 %	90-110	
MBAS Extraction	5540C	01/16/19:200729AMM	Blank	mg/L		ND	<0.1	
			LCS	mg/L	0.5000	109 %	86-114	
			BS	mg/L	0.5000	96.4 %	86-114	
			BSD	mg/L	0.5000	101 %	86-114	
			BSRPD	mg/L	0.5000	4.5%	≤5	

Definition

ICV : Initial Calibration Verification - Analyzed to verify the instrument calibration is within criteria.

ICB : Initial Calibration Blank - Analyzed to verify the instrument baseline is within criteria.

CCV : Continuing Calibration Verification - Analyzed to verify the instrument calibration is within criteria.

CCB : Continuing Calibration Blank - Analyzed to verify the instrument baseline is within criteria.

Blank : Method Blank - Prepared to verify that the preparation process is not contributing contamination to the samples.

LCS : Laboratory Control Standard/Sample - Prepared to verify that the preparation process is not affecting analyte recovery.

MS : Matrix Spikes - A random sample is spiked with a known amount of analyte. The recoveries are an indication of how that sample matrix affects analyte recovery.

MSD : Matrix Spike Duplicate of MS/MSD pair - A random sample duplicate is spiked with a known amount of analyted. The recoveries are an indication of how that sample matrix affects analyte recovery.

BS : Blank Spikes - A blank is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.

BSD : Blank Spike Duplicate of BS/BSD pair - A blank duplicate is spiked with a known amount of analyte. It is prepared to verify that the preparation process is not affecting analyte recovery.

February 12, 2019 Lab ID : VI 1940146

Lemon Cove Water/Sanitary Dist. Customer : 4-11120

Quality Control - Inorganic

Definition	
Dup	: Duplicate Sample - A random sample with each batch is prepared and analyzed in duplicate. The relative percent difference is an indication of precision for the preparation and analysis.
MSRPD	: MS/MSD Relative Percent Difference (RPD) - The MS relative percent difference is an indication of precision for the preparation and analysis.
BSRPD	: BS/BSD Relative Percent Difference (RPD) - The BS relative percent difference is an indication of precision for the preparation and analysis.
ND	: Non-detect - Result was below the DQO listed for the analyte.
DQO	: Data Quality Objective - This is the criteria against which the quality control data is compared.

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CHAIN OF CUSTODY
AND ANALYSIS REQUEST DOCUMENT

ORIGINAL

CLIENT DETAILS — SECTION I

Client: Lemon Cove
☐ New Customer Customer Number: 4-11120
Address:
Phone: Fax:
E-Mail:
Project name: Well 01
Contact person: Bill Pensar
Billing Information (if different from above)
Name:
Address:
Phone: Fax:
E-Mail:
Contact person:
Purchase order/contract/FGL quote number:
Pre Log Required: yes ____ Frequency: Monthly☐ Weekly☐ Quarterly☐ Other☐

SAMPLING — SECTION II

Sampler (s): Jamie Salinas
Comp Sampler Set up Date: Time:
Time: 30 min Mileage:
Shipping Charge: Pickup Charge:

REPORT INFORMATION — SECTION III

Rush Analysis (surcharge will apply):
☐5 Day ☐4 Day ☐3 Day ☐2 Day ☐24 hour
Rush pre-approved by lab:
Electronic Data Transfer: ☐yes ☐no
If yes, To: State ____ Client ____ Other ____
Lab number: 1940146

SAMPLE INFORMATION — SECTION IV

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sampling: Composite (C) or Grab (G)	Number of Containers	Type of Containers: (G) Glass (P) Plastic (V) VOA (MT) Metal Tube	(P) Potable (NP) Non-Potable	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (AgW) Ag Water (WW) Wastewater (DW) Drinking Water	(S) Soil (SLG) Sludge (SLD) Solid (O) Oil	BacT: (Sys) System (SRC) Source (W) Waste	BacT: Routine (ROUT) Repeat (RPT) Other (OTH) Replace (RPL)	(LT) Leaf Tissue (PET) Petiole Tissue (PRD) Produce	Preservative: (1) NaOH + ZnAc, (2) NaOH, (3) HCL (4) H_2SO_4, (5) HNO_3, (6) $Na_2S_2O_3$, (7) Other ____	Analyses Requested: general min. + loc metals; gen phys (odor run in VI); Field pH 7.58
1	Well 01	1-14-19	1010	6	4	6-P	P	DW		SR	OTH		5	X X X

REMARKS — SECTION V

CUSTODY — SECTION VI

Relinquished by and subject to the terms and conditions on the reverse of this document:

Relinquished by:		Date: 1-14-19	Time: 1205	Relinquished by:		Date:	Time:
Received by:		Date: 1/14/19	Time: 1205	Received by:		Date:	Time:
Relinquished by:		Date: 1/14/19	Time: 1730	Relinquished by:	GSO	Date:	Time:
Received by:	GSO	Date: 1/14/19	Time: 1730	Received by:		Date: 1/15/19	Time: 1126

5°

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FAX: (209) 942-0423

Office & Laboratory
563 East Lindo Avenue
Chico, CA 95926
TEL: (530) 343-5818
FAX: (530) 343-3807

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805) 783-2940
FAX: (805) 783-2912

Office & Laboratory
9415 W. Goshen Avenue
Visalia, CA 93291
TEL: (559) 734-9473
FAX: (559) 734-8435

Inter-Laboratory Condition Upon Receipt (Attach to COC)

Sample Receipt at: STK CC CH (VI)

1. Number of ice chests/packages received: 1 Shipping tracking # F.S.
2. Were samples received in a chilled condition? Temps: 5° / ____ / ____ / ____ / ____
   Surface water SWTR bact samples: A sample that has a temperature upon receipt of >10° C, whether iced or not, should be flagged unless the time since sample collection has been less than two hours.

3.	Do the number of bottles received agree with the COC?	(Yes)	No	N/A
4.	Were samples received intact? (i.e. no broken bottles, leaks etc.)	(Yes)	No	
5.	VOAs checked for Headspace?	Yes	No	(N/A)
6.	Were sample custody seals intact?	Yes	No	(N/A)
7.	If required, was sample split for pH analysis?	Yes	No	(N/A)
8.	Were all analyses within holding times at time of receipt?	(Yes)	No	
9.	Verify sample date, time and sampler name	(Yes)	No	

Sign and date the COC, place in a ziplock and put in the same ice chest as the samples.
Sample Receipt Review completed by (initials): CS

Sample Receipt at SP:

1. Were samples received in a chilled condition? Temps: 3 / 1 / ____ / ____ / ____
   Acceptable is above freezing to 6 C. If many packages are received at one time check for tests/H.T.'s/rushes/
2. Shipping tracking numbers: 543436072 | 82

3.	Do the number of bottles received agree with the COC?	(Yes)	No	N/A
4.	Were samples received intact? (i.e. no broken bottles, leaks etc.)	(Yes)	No	
5.	Were sample custody seals intact?	Yes	No	(N/A)

Sign and date the COC, obtain LIMS sample numbers, select methods/tests and print labels.

Sample Verification, Labeling and Distribution:

1.	Were all requested analyses understood and acceptable?	(Yes)	No		
2.	Did bottle labels correspond with the client's ID's?	(Yes)	No		
3.	Were all bottles requiring sample preservation properly preserved? [Exception: Oil & Grease, VOA and CrVI verified in lab]	(Yes)	No	N/A	FGL
4.	VOAs checked for Headspace?	Yes	No	(N/A)	
5.	Have rush or project due dates been checked and accepted?	Yes	No	(N/A)	
6.	Were all analyses within holding times at time of receipt?	(Yes)	No		

Attach labels to the containers and include a copy of the COC for lab delivery.
Sample Receipt, Login and Verification completed by (initials): TC

Discrepancy Documentation:
Any items above which are "No" or do not meet specifications (i.e. temps) must be resolved.

1. Person Contacted:_____ Phone Number:_____
   Initiated By:_____ Date:_____
   Problem:
   Resolution:

2. Person Contacted:_____
   Initiated By:_____
   Problem:
   Resolution:

(Please use the back of this sheet for additional comme
contacts)

(4-11120)
Lemon Cove Water/Sanitary Dist.
VI 1940146
SRP-01/14/2019-12:30:56

Well No. _____ No. 489429

Work Began 10-11-91 Ended 10-17-91

Local Permit Agency TULARE

Permit No. _____ Permit Date _____

received

LATITUDE _____ LONGITUDE _____

APN BK PG PCL

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DEPTH TO FIRST WATER _____ (FT) BELOW SURFACE

DEPTH FROM SURFACE Ft to Ft	DESCRIPTION Describe material, grain size, color, etc
0 – 7	top soil red clay
7 – 32	cobbles & sand
32 – 134	decomposed granite, & sm cobbles
134 – 158	granite black & white

TOTAL DEPTH OF BORING 158 (Feet)

TOTAL DEPTH OF COMPLETED WELL 157.5 (Feet)

WELL OWNER

Name COUNTY OF TULARE & LEMON COVE DISTRICT

Mailing Address COUNTY CIVIC CENTER ROOM III

City VISALIA, CA. 93291-4593 State Zip

WELL LOCATION

Address 50' west of Rd 26 3/4 mi. no. of Ave 324

City TULARE

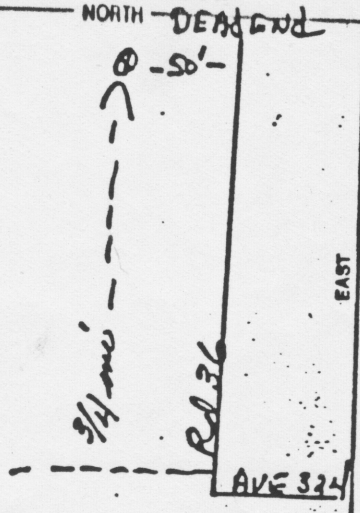
County TULARE

APN Book ___ Page ___ Parcel ___

Township ___ Range ___ Section ___

Latitude ___ DEG MIN SEC NORTH Longitude ___ DEG MIN SEC WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL

MODIFICATION/REPAIR

___ Deepen

___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING

WATER SUPPLY

___ Domestic

X Public

___ Irrigation

___ Industrial

___ "TEST WELL"

___ CATHODIC PROTECTION

___ OTHER (Specify)

DRILLING METHOD air FLUID poly foam

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 20 (FL) & DATE MEASURED 10-17-91

ESTIMATED YIELD* 100 (GPM) & TEST TYPE air lift

TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN ___ (FL)

* May not be representative of a well's long-term yield.

CASING(S)

DEPTH FROM SURFACE Fl to Fl	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL/ GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 – 49	19								
49 – 158	12								
+5.5 – 67.5			X			steel	10¾	¼	
67.5 – 157.5				X		steel	10¾	¼	.040

ANNULAR MATERIAL

DEPTH FROM SURFACE Fl to Fl	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 – 47	X			9 sk. slurr

ATTACHMENTS (✓)

___ Geologic Log

___ Well Construction Diagram

___ Geophysical Log(s)

___ Soil/Water Chemical Analyses

___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME ARTHUR & ORUM WELL DRILLING INC. (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 3262 E. CONEJO AVE. CITY FRESNO STATE CA ZIP 93725

Signed _____ (WELL DRILLER/AUTHORIZED REPRESENTATIVE) DATE SIGNED 10-17 91

C-57 LICENSE NUMBER 361310

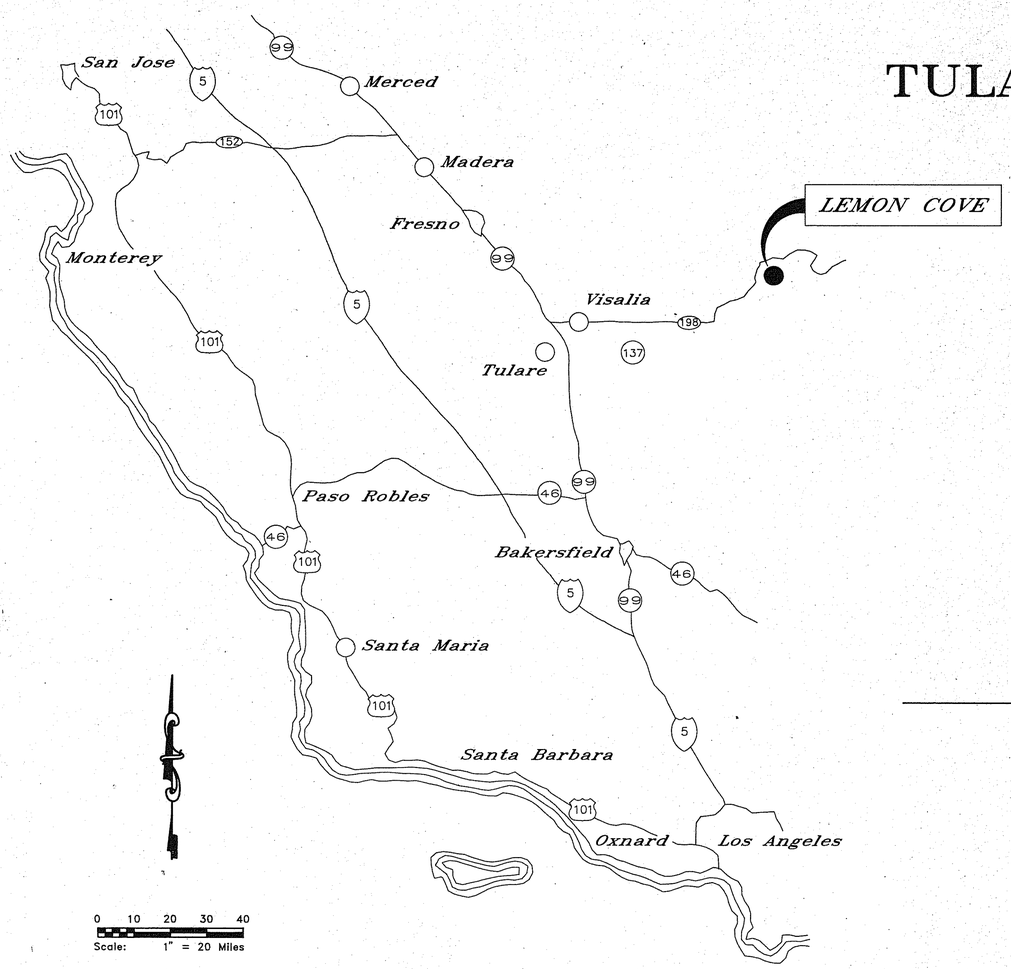
R 188 REV. 7-80

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

LEMON COVE SANITARY DISTRICT
TULARE COUNTY CSA #1 – LEMON COVE ZOB

CONTRACT DRAWINGS FOR

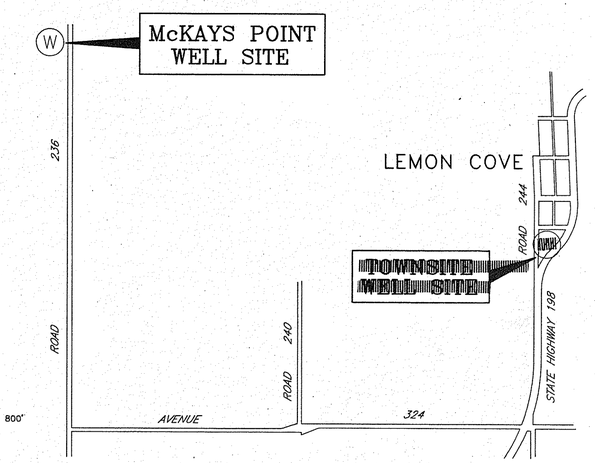
DOMESTIC WATER WELLS AND APPURTENANCES



LOCATION MAP

INDEX TO SHEETS

1 COVER SHEET
2 SITE PLAN – McKAYS POINT WELL
3 SITE PLAN – TOWNSITE WELL
4 WELL & HYDROPNEUMATIC TANK DETAILS
5 STORAGE TANK & BOOSTER PUMP DETAILS
6 McKAYS POINT ELECTRICAL DETAILS
7 TOWNSITE ELECTRICAL DETAILS
8 PIPELINE DETAILS
9 WELL SITE DETAILS



GENERAL NOTES

1. Construction contractor agrees that in accordance with generally accepted construction, construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and construction contractor further agrees to defend, indemnify and hold design professional harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting liability arising from the sole negligence of design professional.
2. In accordance with the provisions of California Public Contract Code Section 3300, the District has determined that the Contractor shall possess a valid Class A (General Engineering) Contractor license at the time the contract is awarded. Failure to possess the specified license shall render the bid as non-responsive and shall act as a bar to award of the contract to any bidder not possessing said license at the time of award.

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

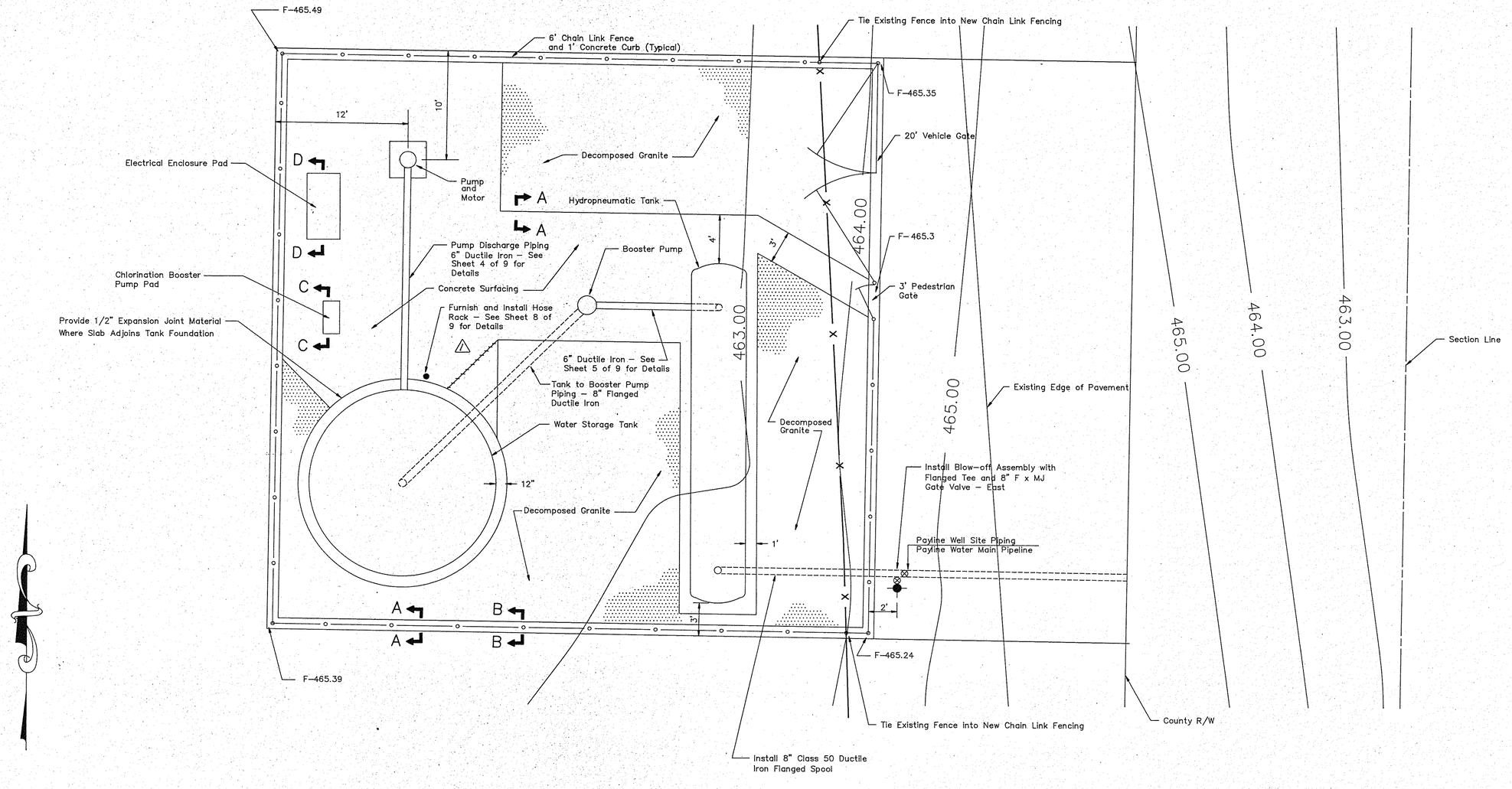
LEMON COVE SANITARY DISTRICT
TULARE COUNTY CSA #1 – LEMON COVE ZOB
COVER SHEET

SCALE: AS INDICATED
DRAWN BY: M. MEEKS
APPROVED BY: D. R. KELLER
C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

SHEET 1 OF 9

BLUEPRINT SERVICE



REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

LEMON COVE SANITARY DISTRICT

TULARE COUNTY CSA #1 — LEMON COVE ZOB

McKAYS POINT WELL

SITE PLAN

SCALE: 1" = 5'-0"

DRAWN BY: M. MEEKS

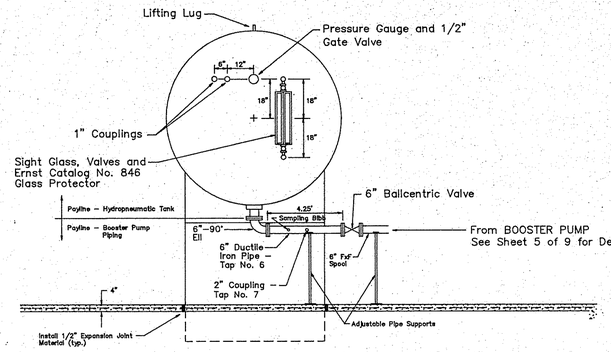
APPROVED BY: D. R. KELLER

C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

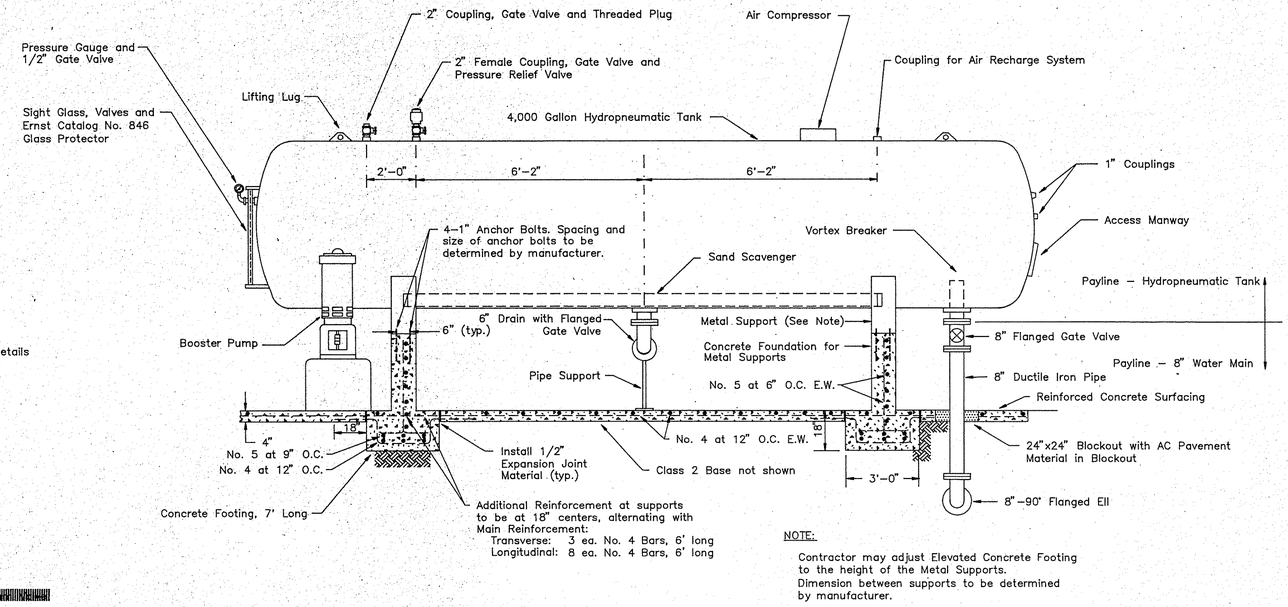
SHEET 2 OF 9

BLUEPRINT SERVICE



INLET END OF TANK AND BOOSTER PUMP DISCHARGE PIPING DETAILS

NOT TO SCALE

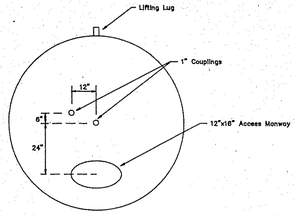


NOTE:

Contractor may adjust Elevated Concrete Footing to the height of the Metal Supports. Dimension between supports to be determined by manufacturer.

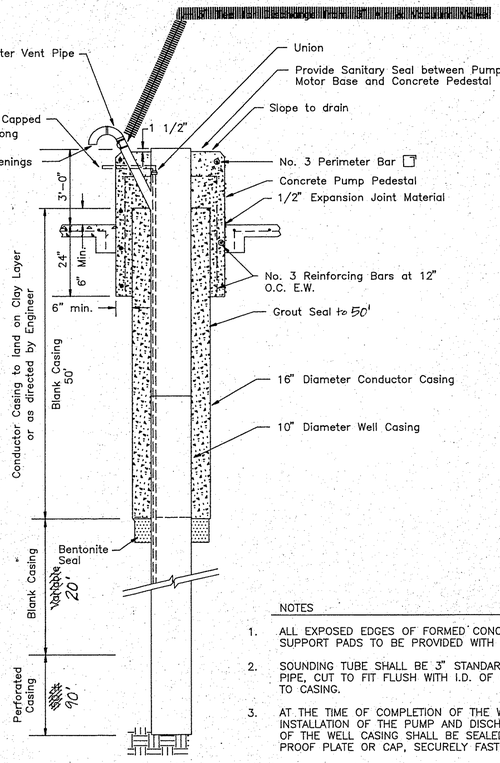
HYDROPNEUMATIC TANK DETAILS

NOT TO SCALE



OUTLET END OF TANK

NOT TO SCALE



NOTES

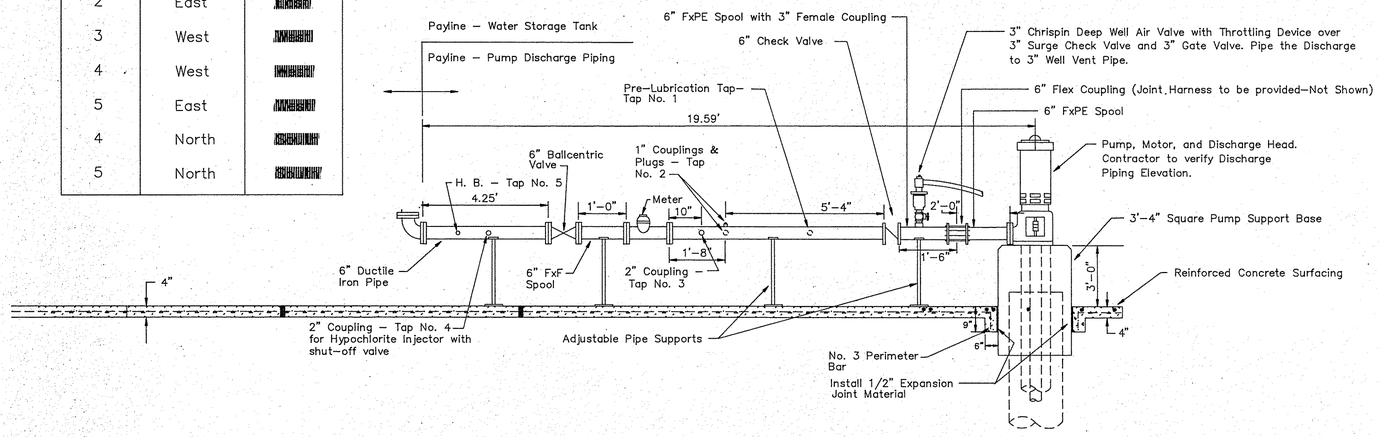
1. ALL EXPOSED EDGES OF FORMED CONCRETE STRUCTURES AND SUPPORT PADS TO BE PROVIDED WITH 45° 3/4"x3/4" CHAMFER.
2. SOUNDING TUBE SHALL BE 3" STANDARD WEIGHT GALVALNIZED PIPE, CUT TO FIT FLUSH WITH I.D. OF CASING AND WELDED TO CASING.
3. AT THE TIME OF COMPLETION OF THE WELL AND PRIOR TO INSTALLATION OF THE PUMP AND DISCHARGE HEAD, THE TOP OF THE WELL CASING SHALL BE SEALED WITH A WEATHER–PROOF PLATE OR CAP, SECURELY FASTENED IN PLACE.
4. ALL EXPOSED EDGES TO BE TOOLED.

WELL DETAIL

Not To Scale

TAP LOCATIONS

TAP NO.	COMPASS DIRECTION	
	McKays Pt	[illegible]
1	West	[illegible]
2	East	[illegible]
3	West	[illegible]
4	West	[illegible]
5	East	[illegible]
4	North	[illegible]
5	North	[illegible]



DISCHARGE PIPING DETAILS

NOT TO SCALE

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

LEMON COVE SANITARY DISTRICT

TULARE COUNTY CSA #1 – LEMON COVE ZOB

WELL AND HYDROPNEUMATIC TANK DETAILS

SCALE: AS INDICATED

DRAWN BY: M. MEEKS

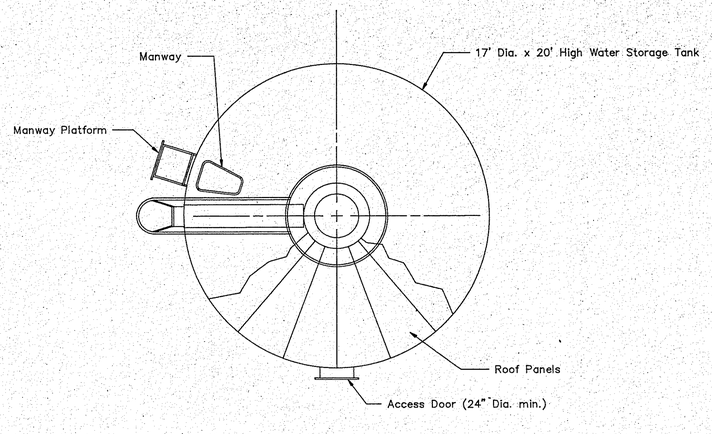
APPROVED BY: D. R. KELLER

C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

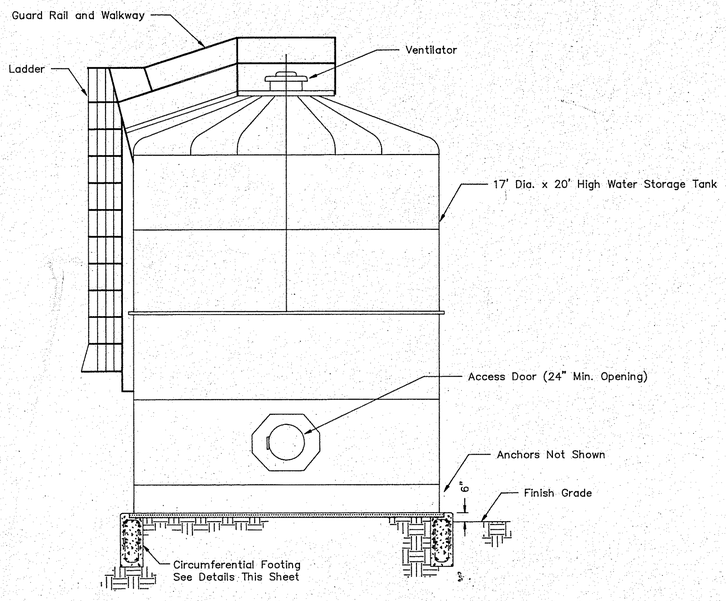
SHEET 4 OF 9

BLUEPRINT SERVICE



TOP VIEW

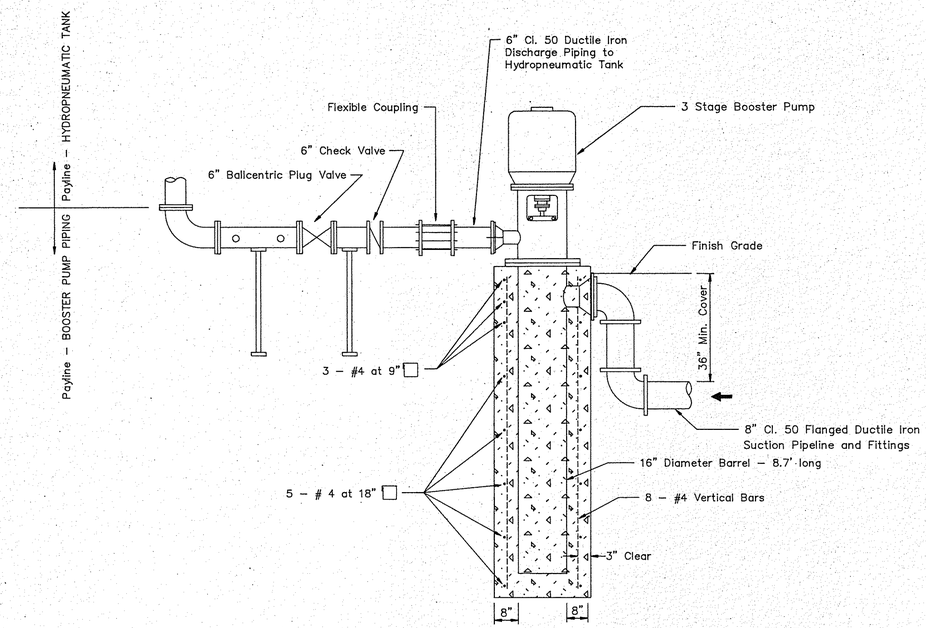
Scale: 1/4" = 1'-0"



SIDE VIEW

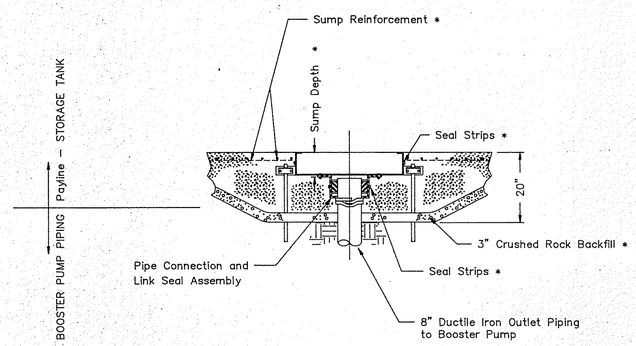
Scale: 1/4" = 1'-0"

WATER STORAGE TANK DETAILS



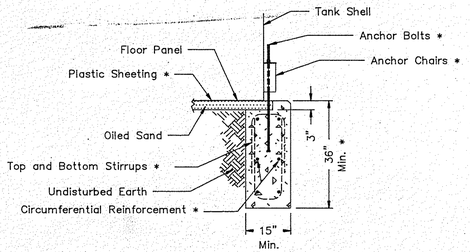
BOOSTER PUMP DETAILS

Scale: 1/2" = 1'-0"



TANK DRAIN DETAIL

Scale: 1/2" = 1'-0"



FOOTING DETAIL

Scale: 1/2" = 1'-0"

* - Per Manufacturer's Design and Specifications

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

LEMON COVE SANITARY DISTRICT

TULARE COUNTY CSA #1 - LEMON COVE ZOB

STORAGE TANK AND BOOSTER PUMP DETAILS

SCALE: As Shown

DRAWN BY: G. WINSETT

APPROVED BY: D. R. KELLER

C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
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CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

SHEET 5 OF 9

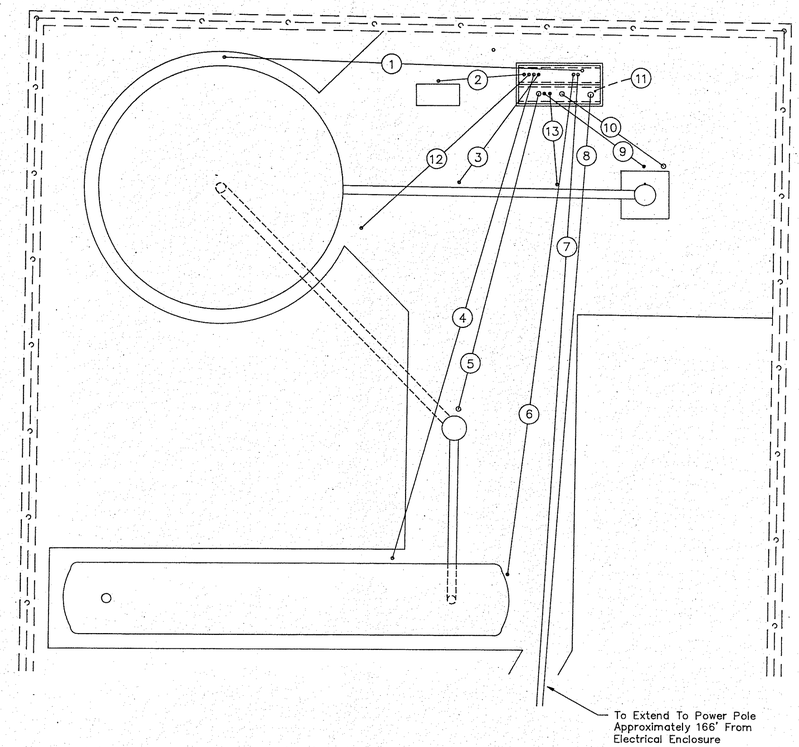
136017 BLUEPRINT SERVICE

ELECTRICAL NOTES

1. The Contractor shall verify service requirements with the serving utility prior to the purchase of electrical meter service equipment.
2. The Electrical Contractor shall verify the exact mounting location of any equipment requiring electrical service which is to be furnished and installed by others.
3. The Control Wiring Diagrams indicate the intent of the operation of the equipment. The Electrical Contractor shall verify, coordinate, and install all electrical and electronic equipment and wiring necessary for the complete electrical operation of the installed equipment.
4. Stub all conduits 1'–6" minimum above slab grade.
5. All conduit and piping runs to be installed and inspected prior to pouring slabs.

CONDUIT LEGEND

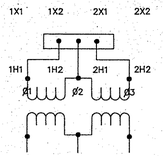
1. 3/4" SCHEDULE 40 PVC CONDUIT FOR TANK LEVEL CONTROLS
2. 1" SCHEDULE 40 PVC CONDUIT FOR FUTURE CHLORINE BOOSTER PUMP
3. 1/2" SCHEDULE 40 PVC CONDUIT FOR METER SIGNAL CABLE
4. 3/4" SCHEDULE 40 PVC CONDUIT FOR TANK AIR COMPRESSOR
5. 2" SCHEDULE 80 PVC CONDUIT FOR MOTOR POWER
6. 1" WRAPPED G.I.P. FOR PRESSURE CONTROL
7. 1 1/2" SCHEDULE 80 PVC CONDUIT FOR FUTURE TELEMETRY CONTROLS
8. 4" SCHEDULE 80 PVC CONDUIT FOR 460V, 3 PHASE POWER
9. 2" SCHEDULE 80 PVC CONDUIT FOR MOTOR POWER
10. 1" SCHEDULE 40 PVC CONDUIT FOR FUTURE OIL RESERVOIR SOLENOID
11. GROUND ROD 3/4" X 10'–COPPERCLAD
12. 1" SCHEDULE 40 PVC CONDUIT FOR AREA LIGHT
13. 1" SCHEDULE 40 PVC CONDUIT FOR PRELUBRICATION SOLENOID



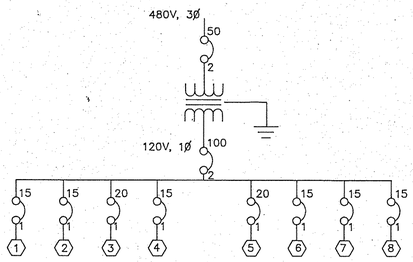
MCKAYS POINT WELL SITE

Not to Scale

(120 VAC)
L1 L2 L3

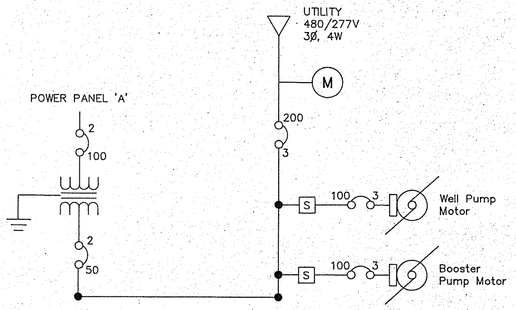


PHASE MONITORING RELAY

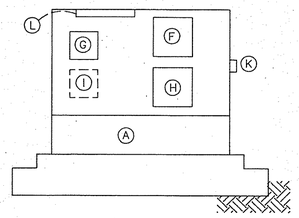


CIRCUIT NO.	J	⊖H	DESCRIPTION
1	1		FLOW RECORDER
2	1		PANEL LIGHTS
3		1	WP RECEPTACLE
4	1		AIR COMPRESSOR
5	1		CHLORINATOR BOOSTER PUMP
6	1		AREA LIGHT
7			SPARE
8	1		SPARE

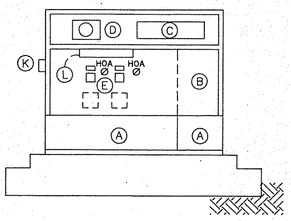
SINGLE LINE DIAGRAM – SINGLE PHASE & POWER PANEL 'A' SCHEDULE



SINGLE LINE DIAGRAM – 3 PHASE



REAR ELEVATION



FRONT ELEVATION

ELECTRICAL PANEL

ELECTRICAL FACILITIES LEGEND

- Ⓐ GUTTER – PROVIDE 1'–6" MIN. CLEARANCE BELOW BALANCE OF CONDUITS
- Ⓑ UTILITY PULL SECTION
- Ⓒ UTILITY TEST BLOCK SECTION
- Ⓓ UTILITY METER SECTION
- Ⓔ PUMP MOTORS SWITCHGEAR
- Ⓕ FLOW RECORDER AND TOTALIZER
- Ⓖ PRESSURE CONTROLS
- Ⓗ CIRCUIT BREAKER PANELBOARD – POWER PANEL 'A'
- Ⓘ TRANSFORMER SECTION
- Ⓙ LIGHT FIXTURE – V SERIES KILLARK WITH VFPS ADAPTER AND GUARD
- Ⓚ EXTERIOR WP DUPLEX RECEPTACLE
- Ⓛ PANEL LIGHT

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	DK

LEMON COVE SANITARY DISTRICT
TULARE COUNTY CSA #1 – LEMON COVE ZOB
MCKAYS POINT WELL
WATER WELL ELECTRICAL DETAILS

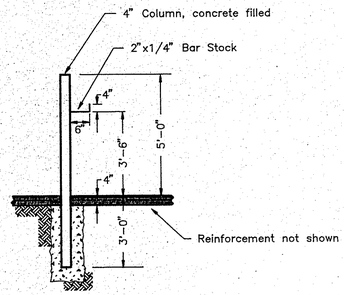
SCALE: AS INDICATED

DRAWN BY: M. MEEKS
APPROVED BY: D. R. KELLER
C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

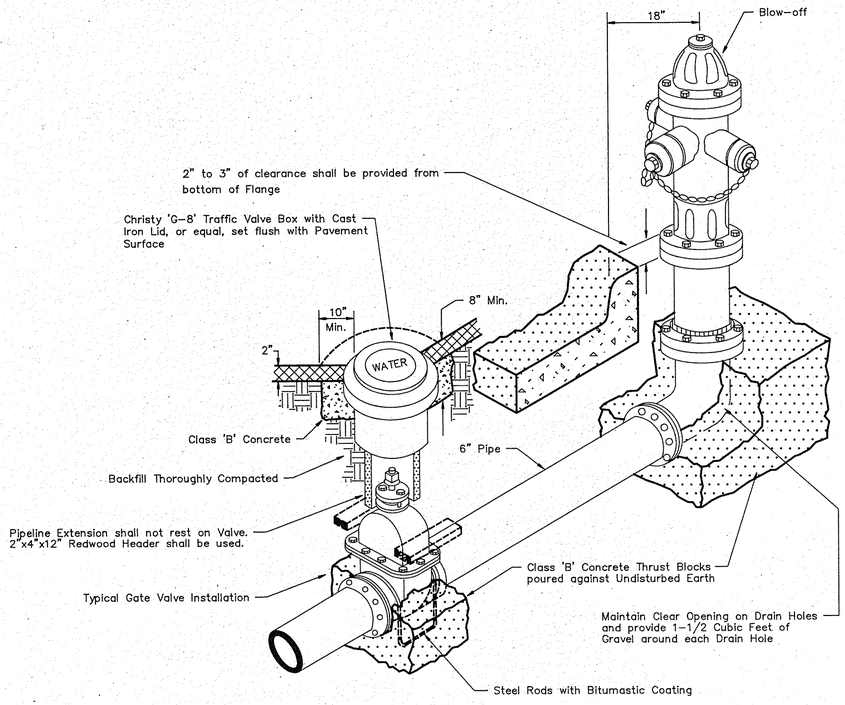
SHEET 6 OF 9

BLUEPRINT SERVICE



HOSE RACK DETAIL

NO SCALE

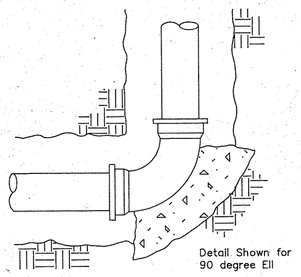


BLOW-OFF ASSEMBLY DETAIL

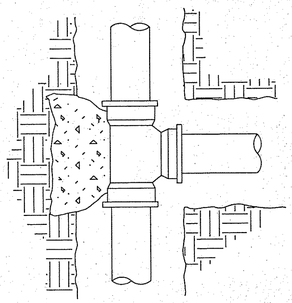
REQUIRED BEARING AREA – TOTAL SQUARE FEET						
TYPE OF FITTING		ELL			TEE	CROSS
		22-1/2°	45°	90°		
SIZE OF PIPE	6"	1	2	4	3	4
	8"	2	4	7	5	7

NOTES:

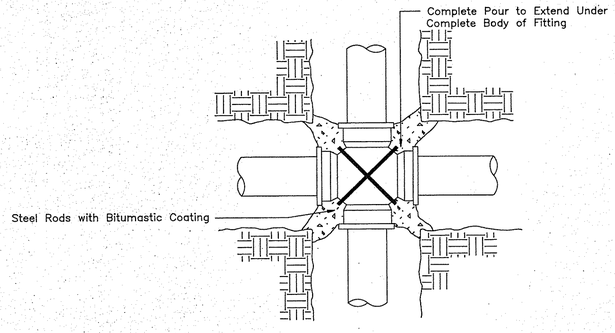
1. Thrust Blocks to be constructed of Class 'B' Concrete.
2. Areas given are for Class 150 Pipe at Pressure of 150 p.s.i. in soil with 2,000 p.s.f. bearing capacity.
3. Blocks to be poured against Undisturbed Native Soil.
4. Joints and Blow-off Barrel Drains to be kept clear of Concrete.
5. Minimum thickness of Thrust Blocks to be 6 inches.
6. Thrust Block areas for Caps shall be the same as shown for Tee.



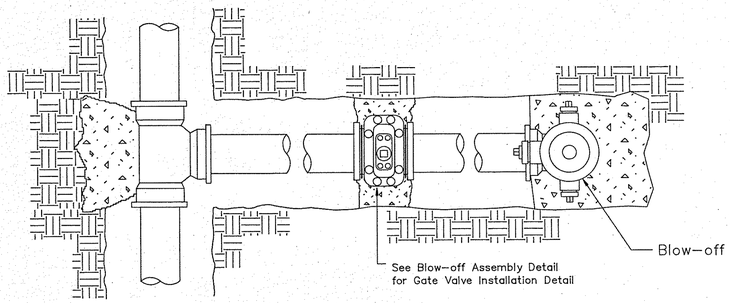
ELL



TEE



CROSS



TEE

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

LEMON COVE SANITARY DISTRICT

TULARE COUNTY CSA #1 – LEMON COVE ZOB

PIPELINE DETAILS

SCALE: NO SCALE

DRAWN BY: M. MEEKS

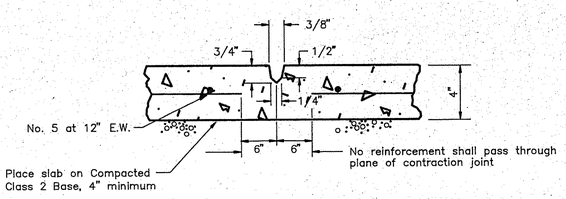
APPROVED BY: D. R. KELLER

C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

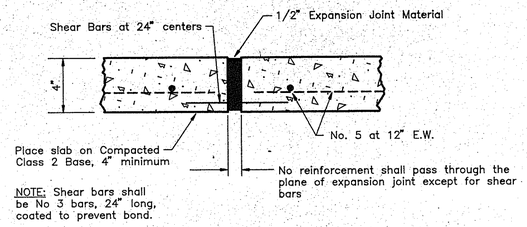
SHEET 8 OF 9

135017 BLUEPRINT SERVICE



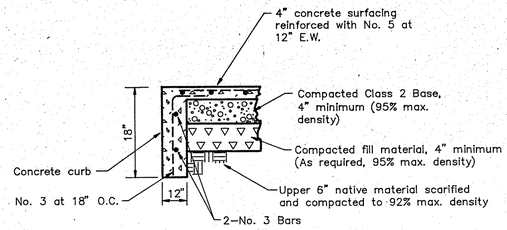
CONTRACTION JOINT DETAIL

NO SCALE



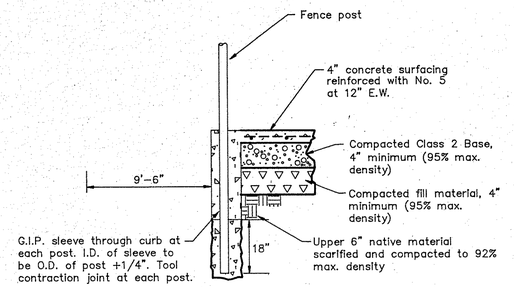
EXPANSION JOINT DETAIL

NO SCALE



SECTION A–A

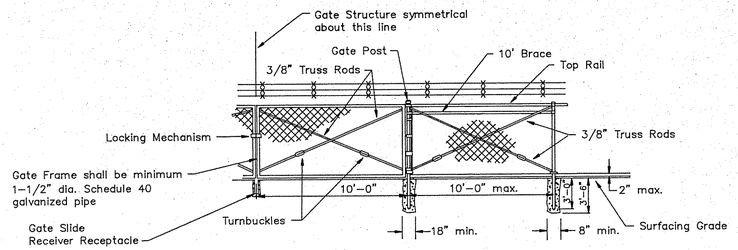
NO SCALE



Reinforcement not shown.

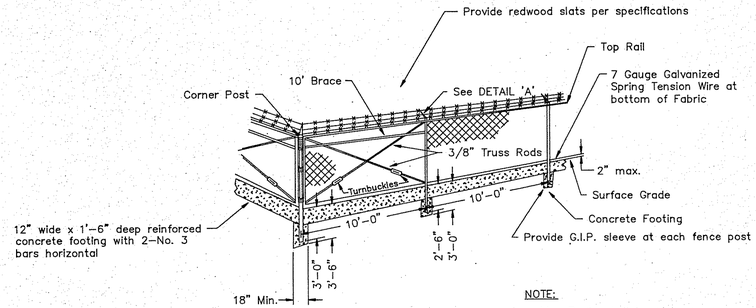
SECTION B–B

NO SCALE



VEHICLE GATE DETAIL

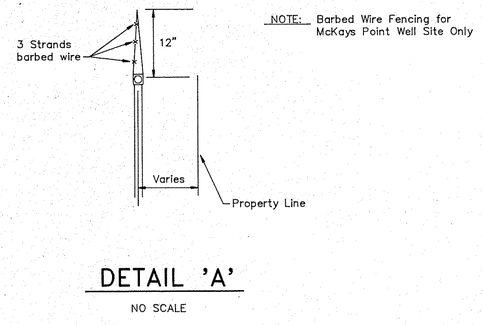
NO SCALE



NOTE:
Line Posts shall be at a maximum spacing of 10'–0".

CORNER POST DETAIL

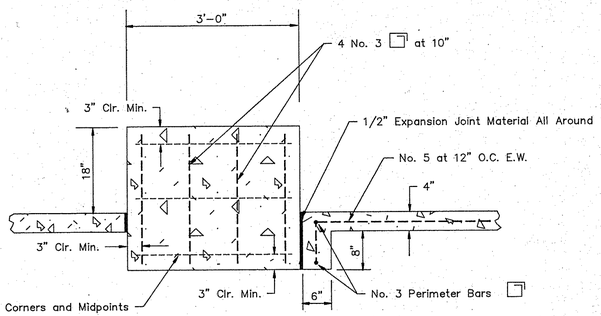
NO SCALE



NOTE: Barbed Wire Fencing for McKays Point Well Site Only

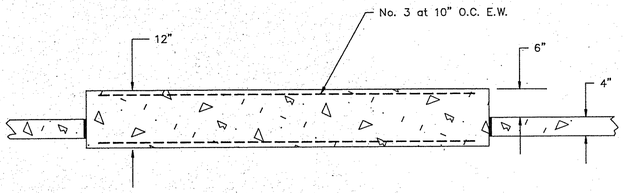
DETAIL 'A'

NO SCALE



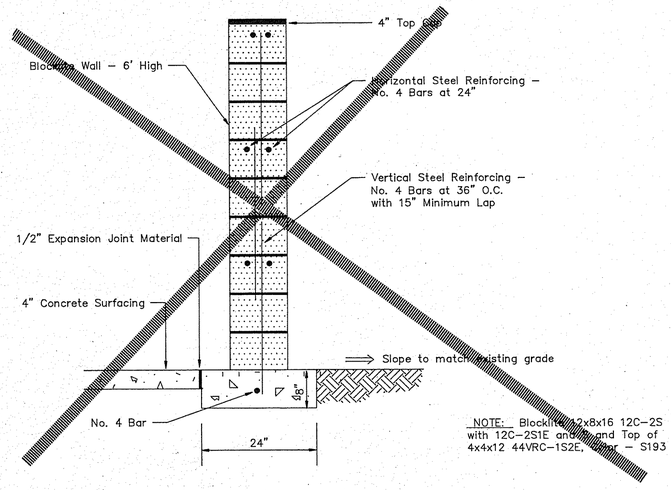
SECTION C–C

CHLORINATION BOOSTER PUMP PAD AT 18" ABOVE SLAB ELEVATION WITH EXPANSION JOINT MATERIAL ALL AROUND



SECTION D–D

ELECTRICAL PANEL PAD PLACED 6" ABOVE SLAB ELEVATION



NOTE: Block (4) 12x8x16 12C–2S with 12C–2S1E and Top of 4x4x12 44VRC–1S2E, – S193

SECTION E–E

REVISION	DATE	DESCRIPTION	APPROVED
1	12/10/92	As-Built	D.K.

LEMON COVE SANITARY DISTRICT

TULARE COUNTY CSA #1 – LEMON COVE ZOB

WELL SITE DETAILS

SCALE: AS INDICATED

DRAWN BY: M. MEEKS

APPROVED BY: D. R. KELLER

C.E. NO. 24199 DATE: 05/31/91

DENNIS R. KELLER
JAMES H. WEGLEY
CONSULTING ENGINEERS
209 SOUTH LOCUST STREET
VISALIA, CALIFORNIA 93291 209-732-7938

SHEET 9 OF 9

130617 BLUEPRINT SERVICE

Question re: McKay Point Reservoir Project

Graham Stephens <gstephens@sespeconsulting.com>
Tue 10/27/2020 8:48 AM
To: Graham Stephens <gstephens@sespeconsulting.com>

From: Tenneboe, Annette@Wildlife <Annette.Tenneboe@wildlife.ca.gov>
Sent: Monday, October 26, 2020 19:32
To: Maya Rohr <mrohr@sespeconsulting.com>
Subject: Question re: McKay Point Reservoir Project

Maya,

I hope this finds you well. I am the Regional Water Rights Coordinator for California Department of Fish and Wildlife, Central Region (Region 4), and am reviewing the current NOP for the McKay Point Reservoir Project (SCH #2014011078). The Project description states that the objectives include capturing and re-regulating water and water entitlements. I am wondering if you would please clarify what is meant by "re-regulating" in the context of the project's objectives.

Please feel free to let me know if you have any questions regarding this correspondence.

Thank you,

Annette Tenneboe
Senior Environmental Scientist (Specialist)
California Department of Fish and Wildlife
Central Region - R4
1234 East Shaw Avenue
Fresno, California 93710
annette.tenneboe@wildlife.ca.gov

TID McKay Point Project

Graham Stephens <gstephens@sespeconsulting.com>
Wed 10/28/2020 9:18 AM
To: Graham Stephens <gstephens@sespeconsulting.com>

From: "jkirkpatrick@onemain.com" <jkirkpatrick@onemain.com>
Date: October 27, 2020 at 9:48:31 PM PDT
To: Maya Rohr <mrohr@sespeconsulting.com>
Cc: Tricia Stever Blattler <pstever@tulcofb.org>, Craig Knudson <quixotefarms@outlook.com>, "akf@tulareid.org" <akf@tulareid.org>
Subject: TID McKay Point Project

Maya Rohr,

In connection with the Tulare Irrigation District McKay Point Reservoir project Notice of Preparation, Scoping, CEQA proceedings and related information, I have a couple of questions and requests listed below:

1. Could you please provide the list of agencies and interested parties to whom the NOP was sent?
2. If an Initial Study (IS) was prepared, will you please provide a copy of it? (It would be useful to have the IS, or similar documentation, in order to reduce comment duplication of potential environmental and economic impacts that may have already identified.)

I am a member of the Tulare County Farm Bureau Land Use Committee. The committee has scheduled a Thursday afternoon (10/29/20) informational meeting with Aaron Fukuda. The TCFB Executive Director, Tricia Stever-Blattler has been on vacation until today. I am confident she would appreciate obtaining the requested information before the Thursday meeting if that would be possible.

Sincerely,

John Kirkpatrick

Cc: Tricia Stever-Blattler
Aaron Fukuda
Craig Knudsen

TID McKay Point Project

Graham Stephens <gstephens@sespeconsulting.com>

Fri 10/30/2020 8:32 AM

To: Graham Stephens <gstephens@sespeconsulting.com>

On Oct 29, 2020, at 4:40 PM, Tricia Stever Blattler <pstever@tulcofb.org> wrote:

> Please do add TCFB. We received a PRESENTATION on this in August 2013 but then never received any further contact on this. Thanks. Send to address below. Please!
>
> Tricia Stever Blattler
> Executive Director
> Tulare County Farm Bureau
> 737 N Ben Maddox Way
> Visalia CA 93292
>
> 559-732-8301 office

Tulare County Farm Bureau Land Use Presentation

Aaron Fukuda <akf@tulareid.org>

Thu 10/29/2020 9:40 PM

To: James Silva <jsilva@cpdc1874.org>; Ed DeBoer <edeboer@wcsg.com>; Dan Reyneveld <dreyneveld@wcsg.com>; Alex Peltzer <apeltzer@prlawcorp.com>; John Hecht <jhecht@sespe.com>; Maya Rohr <mrohr@sespeconsulting.com>; Graham Stephens <gstephens@sespeconsulting.com>

Hi Guys,

Late last week the Executive Director reached out to me regarding numerous calls she received from John Kirkpatrick regarding our project. I told her I would be willing to update any of her various committees on the projects, specifically the ones that John sat on. She asked me to present today at the Land Use Committee. In attendance were:

Tricia Stivers-Blatner - TCFD Executive Director
Kurt Schmidt - UC Coop. Ext.
Greg Galloway
George Clausen (lives just north of the Lemon Cove Plant)
Byron Fox
Nancy Lang (lives near George Clausen)
Mile Gordon
Craig Knudsen
John Kirkpatrick

I gave a revised presentation based upon what we used at the Scoping Sessions. Most of the comments centered around understanding how we were addressing groundwater and protecting the local groundwater. They were happy to hear Ken Schmidt was working with us but concerned about using Ian, only because they do not know who he is. They also will want to make sure we address groundwater issues in a cumulative impact analysis and the potential for evaporation. Lastly, regarding water related issues, there were questions about the Lemon Cove site and how we might use that property.

John Kirkpatrick is concerned about releasing water by gravity down the St. Johns River and using the McKay Point gate structures to back water up the river. He thinks there will be impacts. Again he reiterated that he is not happy with how the County has handled Reclamation Plans.

There were some concerns about West Coast Sand and Gravel and their assurances to complete the mining operation. I noted that we were pursuing an agreement, but could not divulge details. They seemed to be satisfied that there was an agreement being developed.

In general, they supported the project. Even those that made some comments highlighted the need to get this project built to develop storage. Nancy Lang even asked how she could potentially purchase some supplies or benefit from the project.

Thanks

Aaron Fukuda
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274
Office: 559.686.3425
Cell: 559.707.8928

November 1, 2020

Aaron Fukuda
Tulare Irrigation District
6826 Ave 240
Tulare, CA 93274

RE: *McKay Point Reservoir Project: Input*

Dear Mr. Fukuda,

I am writing to follow up my zoom questions that I asked in the scoping meeting held on October 29, 2020.
My citrus ranch, my farm house, and tenant's farmhouse are located north of the proposed project. My APNs are: 064-100-019; 064-110-028; 064-110-034. Not only do I have domestic wells for the houses but have irrigation wells for the 52 acres I farm. I do not have any surface water rights, and am 100% dependent on my domestic and irrigation wells.
I am all for more water storage and generally approve of the plans to use the mining pits for water diversion and storage. But I am aware of the negative impacts that sand and gravel mining can have on nearby wells. As I expressed on the zoom meeting, I am concerned on negative impacts on my wells and my neighbor's wells. There has been great deal of mining in the area, with the Stillwell site and also the Cemex sites that are in my direct vicinity. The Cemex site has basically no reclamation plan for the site once the mine is abandoned. This has been a long time concern of mine.

I hope that the Reservoir project EJR will take into account the water dynamics of the whole mined region and assess if there could be some kind of domino effect or interaction from the mining activity in the adjoining area, not just proposed the water storage site. Since groundwater flows throughout the whole area, there could be interactions from the excavating of the proposed site with existing mining sites.
From what I gathered from the scoping meeting, the proposed water storage will help the water balance in the Greater and Mid Kaweah GSAs and the farms in those GSAs, but not the farms located in the East Kaweah GSA. My property lies in the East Kaweah GSA, on the border with the Greater Kaweah. If the storage only benefits the other GSAs and negatively affects the East Kaweah farms there should be some way to make the East Kaweah GSA benefit too.
I would like to see if EIR predicts that there could be negative impacts on our wells, that some arrangement be made for us in this situation to have some "water credit" for the potential water losses.

I want it to be noted in the record that I am concerned about having my wells negatively impacted by the water diversion.

Sincerely, Nancy Lange

Nancy Lange

DEPARTMENT OF TRANSPORTATION
DISTRICT 6 OFFICE
1352 WEST OLIVE AVENUE
P.O. BOX 12616
FRESNO, CA 93778-2616
PHONE (559) 445-5421
FAX (559) 488-4088
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life

November 2, 2020

06-TUL-216-18.189
SCH#2014011078
MCKAY POINT RESERVOIR PROJECT

SENT VIA EMAIL

Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Dear Ms. Rohr:

Thank you for the opportunity to review the Notice of Preparation of a Draft Environmental Impact Report for the McKay Point Reservoir Project. The project proposes to develop approximately 200 acres within the 500- acre McKay Point property into a surface water storage and re-regulation reservoir. The project is located in Tulare County.

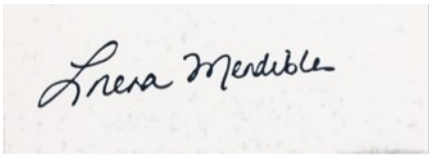
The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development -Intergovernmental Review (LD-IGR) Program reviews land use projects and plans through the lenses of our mission and state planning priorities of infill, conservation, and travel-efficient development. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network.

Caltrans provides the *following comments* consistent with the State's smart mobility goals that support a vibrant economy and sustainable communities:

1. Based on the information submitted, Caltrans believes that the above referenced project will not have a significant impact on the State Highway System. However, Caltrans requests the opportunity to review any future proposed development that has the potential to impact the State Highway System.

If you have any other questions, please contact Lupita Mendoza, Transportation Planner, at (559) 488-4260 or at lupita.mendoza@dot.ca.gov.

Sincerely,



LORENA MENDIBLES, Chief
Transportation Planning –South

State Water Resources Control Board

NOV 02 2020

Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Ave, A203
San Diego, CA 92110
mrohr@sespe.com

Dear Ms. Rohr:

COMMENTS ON NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR TULARE IRRIGATION DISTRICT'S MCKAY RESERVOIR PROJECT

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the proposed Draft Environmental Impact Report (Draft EIR) for Tulare Irrigation District's McKay Reservoir Project. The NOP states the Project Owners consist of Tulare Irrigation District, the Consolidated Peoples Ditch Company, and the Visalia and Kaweah Water Company. The McKay Reservoir Project as described by the NOP involves the Tulare Irrigation District's development of a surface water storage and re-regulation reservoir. In addition, the NOP indicates the reservoir would also be used to optimize groundwater recharge in the Project Owners' service area.

Projects which will divert water from a surface water or subterranean stream flowing through known and definite channels using any of the following methods require a valid water right:

- Diversion through a pipe, canal or other means for direct use (including non-consumptive uses) and/or storage in a reservoir
- Diversion through well pumping from a subterranean stream
- Collection of water in a reservoir located on a stream
- Diversion onto farm fields, groundwater recharge facilities or by other means for groundwater banking (also known as groundwater storage)
- Diversion of flood flows, peak flows, storm flows or surplus flows for beneficial use, such as providing an alternate water supply for domestic, municipal or irrigation purposes
- Diversion of a spring which would otherwise flow off the property from which it originates at any time during the year

In addition, there are other types of projects which may require modification to an existing water right or approval through a petition process. These are:

- Projects that will transfer water under water right permits or licenses
- Projects that will dedicate water to instream flow purposes
- Projects that will modify a water right permit or license by any of the terms or conditions, such as changing the place of use, point of diversion, or purpose of use
- Projects that will change the point of discharge, place of use, or purpose of use of treated wastewater

A valid water right is required to divert from any stream system, even if the stream flows for only limited periods during or shortly after storm events, and even where the stream shows only limited signs of channelization, such as a swale on a topographic map. The NOP states the Project Owners are all members of the Kaweah and St. Johns Waters Association which oversees surface water rights and diversion operations on the Kaweah River. If the McKay Reservoir Project will involve changes to existing surface water rights and/or new water rights, the Division of Water Rights (Division) requests that the Draft EIR include information and analyses related to potential changes in streamflow and related effects on instream resources that may result from the project. The Draft EIR will need to be sufficient for the Division to rely on as a responsible agency when acting on requests for changes to existing water rights or issuance of new water rights related to the project.

For your reference and further information, below are links to our Water Rights Petitions and Applications websites.

Petitions:
https://www.waterboards.ca.gov/waterrights/water_issues/programs/petitions/

Applications:
https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/

Should you have any questions regarding this matter, please contact Patricia Fernandez at (916) 319-9141 or via email at patricia.fernandez@waterboards.ca.gov. Written correspondences should be addressed as follows: State Water Resources Control Board, Division of Water Rights, Attn: Patricia Fernandez, P.O. Box 2000, Sacramento, CA 95812-2000.

Sincerely,

ORIGINAL SIGNED BY:

Sam Boland-Brien, P.E., Program Manager
Petition, Licensing, and Registration Section
Division of Water Rights

RE: Comments for NOP on McKay Point

Tricia Stever Blattler <pstever@tulcofb.org>
Wed 11/4/2020 10:20 AM

To: Maya Rohr <mrohr@sespeconsulting.com>
Cc: Aaron Fukuda (akf@tulareid.org) <akf@tulareid.org>; Graham Stephens <gstephens@sespeconsulting.com>

Thanks for the receipt email!

From: Maya Rohr <mrohr@sespeconsulting.com>
Sent: Wednesday, November 4, 2020 10:19 AM
To: Tricia Stever Blattler <pstever@tulcofb.org>
Cc: Aaron Fukuda (akf@tulareid.org) <akf@tulareid.org>; Graham Stephens <gstephens@sespeconsulting.com>
Subject: RE: Comments for NOP on McKay Point

Hi Tricia

We have added the County Farm Bureau to our mailing list and you will be receiving all notices regarding the DEIR including the notification of the 45 day public comment period and future public meetings. We will review and address your concerns in the DEIR and/or directly in communications with you. In addition, your concerns and letters (emails) will be part of the Administrative Record for the Project.

Public participation is an important part of the CEQA process. So thank you for taking the time to provide us with input on the Project.

Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110
Phone: (805) 275-1515
Email: mrohr@sespe.com

From: Tricia Stever Blattler <pstever@tulcofb.org>
Sent: Wednesday, November 4, 2020 10:01
To: Maya Rohr <mrohr@sespeconsulting.com>
Cc: Aaron Fukuda (akf@tulareid.org) <akf@tulareid.org>
Subject: Comments for NOP on McKay Point

Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110
Phone: (805) 275-1515
Email: mrohr@sespe.com

November 3, 2020

Dear Ms. Rohr,
We would like to be placed on the notification list for all future correspondence related to the McKay Point Reservoir project. Please make certain Tulare County Farm Bureau receives notification for the Draft EIR please.

We are pleased to see the project moving forward after many years. We last received a presentation on the project in August 2013 at our Land Use Committee meeting. We appreciate that Aaron Fukuda took time to provide a great overview of the project to our committee on October 29, 2020 to bring us up to date. I encourage you to also review and update the MckayPoint.com website to make sure the public can utilize the website for relevant and up to date details related to the project.

Our committee is generally supportive of advancements for a project that would bring more surface water storage to the region, being mindful of neighboring property owner's rights and responsibilities and continuing to ensure access to the groundwater resources in the area for all users surrounding the new project.

The Farm Bureau took a neutral position many years back on the Stillwell DEIR, but requested Tulare County bring its Mineral Resources Policy up to date. That was done through formation of the Mineral Resources Policy Advisory Committee (MrPAC) on which a large number of citizens, industry and RMA Staff devoted huge amounts of time and energy. The resulting policy was good, but its application and code enforcement since then have been disappointing. We urge your study and future implementation of the proposed project consider the importance of ensuring the County has adequate measures in place to address failures of the past, and that enforcement of the permits and remediation guidelines for this site are appropriately developed, monitored and consistently adhered to during the course of this project. This will make the project more favorable to surrounding landowners, neighbors, and Farm Bureau in general.

The main considerations that were voiced in our discussions with Aaron are noted below.

The McKay Point reservoir draft EIR should be certain to address and study:

1. The hydrogeological effects of the project and the surrounding area. Mining to bedrock and sealing the resulting reservoir basin must be fully evaluated, diligently monitored, mitigated and modified if unexpected negative events occur or are identified;
2. While hydrologic benefits are very attractive, there may be some downsides, such as possible catastrophic pit capture and channelizing of flood waters;
3. Real time and cumulative evaporation from surface waters must also be evaluated.
4. Hydrology studies should include what happens if water pushes back up the river.

Some of the general comments/questions asked of TID about the project at our Land Use Meeting were:

1. How will the local Groundwater Sustainability Agencies of Kaweah sub-basin benefit from this reservoir? Or will they?
2. Who will be the consulting hydrologists on the project?
3. Are you studying cumulative impacts within the EIR, specifically evaporation from surface water?

4. What facility will be used for the new partner's crushing site?
5. What will be the approximate size of the finished reservoir?

We look forward to reviewing the draft EIR when notified of its release.

Thank you.

Tricia Stever Blattler
Executive Director
Tulare County Farm Bureau
737 N. Ben Maddox Way
Visalia CA 93292

pstever@tulcofb.org
559-732-8301 office

Notice of Preparation

Graham Stephens <gstephens@sespeconsulting.com>
Tue 11/10/2020 3:29 PM
To: Graham Stephens <gstephens@sespeconsulting.com>

From: Aaron Fukuda <akf@tulareid.org>
Sent: Tuesday, November 10, 2020 14:28
To: Doug Reynolds <DReynolds@teichert.com>
Subject: Re: Notice of Preparation

Will do Doug. I will have Sespe change the address to the PO box and I will have to see if we are going to do digital notifications for the EIR.

Thanks

Aaron Fukuda
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274
Office: 559.686.3425
Cell: 559.707.8928

On Tue, Nov 10, 2020 at 2:36 PM Doug Reynolds <DReynolds@teichert.com> wrote:

> Aaron,
>
> 22400 Avenue 335 is a physical address not a Post Office delivery address.
>
> Our Post Office address is PO Box 515, Woodlake, CA. I would prefer to be notified by email at the email address I just sent to you requesting notification.
>
> Doug
>
> Doug Reynolds
> Teichert Materials
> Mobile 559-967-2204
> dreynolds@teichert.com
>
> ---
>
> **From:** Aaron Fukuda <akf@tulareid.org>
> **Sent:** Tuesday, November 10, 2020 2:13 PM
> **To:** Doug Reynolds <DReynolds@teichert.com>
> **Subject:** Notice of Preparation
>
> CAUTION: External Sender

Hi Doug,

On our website (www.tulareid.org), you can download the Notice of Preparation (NOP) document and a list of those notified of the NOP. While I completely trust that you did not get the notice, our records show that we sent it to Santa Fe Aggregates at 22400 Avenue 335.

If you prefer the future notices to be sent to another location, please let me know.

Again, please feel free to contact me if you have any questions or concerns.

Thanks

Aaron Fukuda
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274
Office: 559.686.3425
Cell: 559.707.8928

McKay's Point Notification

Graham Stephens <gstephens@sespeconsulting.com>
Wed 11/11/2020 8:18 AM
To: Graham Stephens <gstephens@sespeconsulting.com>

---------- Forwarded message ---------
From: **Doug Reynolds** <DReynolds@teichert.com>
Date: Tue, Nov 10, 2020 at 2:31 PM
Subject: McKay's Point Notification
To: Aaron Fukuda <akf@tulareid.org>

Aaron,

As we discussed this afternoon, I am very disappointed that Santa Fe Aggregates was not notified of the EIR NOP Scoping meeting for your McKay's Point Project.

Please add Michelle Cunningham and me to the notification list for all information and meeting regarding the McKay's Point project.

Michelle Cunningham
mdcunningham@teichert.com
(209) 765-2256 mobile

Doug Reynolds
dreynolds@teichert.com
(559)967-2204 mobile

Thank you,

Doug

Doug Reynolds
Teichert Materials
Mobile 559-967-2204
dreynolds@teichert.com

McKay Point Reservoir (Project) SCH No. 2014011078.pdf

Graham Stephens <gstephens@sespeconsulting.com>

Thu 11/12/2020 4:16 PM

To: Graham Stephens <gstephens@sespeconsulting.com>

1 attachments (399 KB)

McKay Point Reservoir (Project) SCH No. 2014011078.pdf;

From: Martinez, Monica@Wildlife <Monica.Martinez@wildlife.ca.gov>
Sent: Thursday, November 12, 2020 15:35
To: Maya Rohr <mrohr@sespeconsulting.com>
Subject: McKay Point Reservoir (Project) SCH No. 2014011078.pdf

Good afternoon,

Please see the attached letter.

If you have any questions, please contact Annette Tenneboe, Senior Environmental Scientist (Specialist), at Annette.Tenneboe@wildlife.ca.gov.

Thank you,

Monica Martinez
CEQA/CESA Project Tracking
Department of Fish and Wildlife
Central Region 4

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Avenue
Fresno, California 93710
(559) 243-4005
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

November 12, 2020

Maya Rohr
Sespe Consulting, Incorporated
3990 Old Town Avenue, Suite A203
San Diego, California 92110
mrohr@sespe.com

Subject: **McKay Point Reservoir Project (Project)**
Notice of Preparation (NOP)
State Clearinghouse No.: 2014011078

Dear Ms. Rohr:

The California Department of Fish and Wildlife (CDFW) received an NOP for an Environmental Impact Report (EIR) from Tulare Irrigation District (Tulare ID), which is the Lead Agency for the Project pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, CDFW appreciates the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

While the comment period may have ended, CDFW would appreciate if you will still consider our comments.

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (*Id.*, § 1802). Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

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agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources. CDFW is also submitting comments as a **Responsible Agency** under CEQA (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority (Fish & G. Code, § 1600 *et seq*.). Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 *et seq*.), related authorization as provided by the Fish and Game Code will be required.

CDFW has jurisdiction over fully protected species of birds, mammals, amphibians and reptiles, and fish, pursuant to Fish and Game Code sections 3511, 4700, 5050, and 5515. Take of any fully protected species is prohibited and CDFW cannot authorize their incidental take.

The use of unallocated stream flows are subject to appropriation and approval by the State Water Resources Control Board (SWRCB) pursuant to Water Code section 1225. CDFW, as Trustee Agency, is consulted by the SWRCB during the water rights process to provide terms and conditions designed to protect fish and wildlife prior to appropriation of the State's water resources. Certain fish and wildlife are reliant upon aquatic ecosystems, which in turn are reliant upon adequate flows of water. CDFW therefore has a material interest in assuring that adequate water flows within streams for the protection, maintenance, and proper stewardship of those resources. CDFW provides, as available, biological expertise to review and comment on environmental documents and impacts arising from project activities.

PROJECT DESCRIPTION SUMMARY

Proponent: The Tulare ID is the Lead Agency for the Project. The Project proponents are Tulare ID, the Consolidated People's Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Proposed Project: The Project would develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River, and would consist of the following phases: excavation of the site for the reservoir, construction of the reservoir, and operation of the reservoir.

The Project would divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point. The reservoir would provide a water storage capacity of approximately 4,600 acre-feet

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and deliver water back to either the Lower Kaweah River or the St. Johns River, as needed. The Project would provide additional storage capacity for storm water layoff and flood prevention. The reservoir would also be used to optimize groundwater recharge within the service areas for Tulare ID, CPCD, and VKWC.

Objectives: The Project objectives include capturing and re-regulating water made available to the Project proponents during flood releases from Lake Kaweah; capturing and re-regulating water entitlements belonging to the Project proponents released from Lake Kaweah; capturing and re-regulating water released for the Project proponents during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah); capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Project proponents; allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Project proponents; allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Project proponents and Kaweah/St. Johns water rights interests; constructing the reservoir in such a way that revenue can be obtained to offset the construction and development costs; and locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

Location: The Project site includes portions of the following Assessor's Parcel Numbers: 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, and 113-100-002-000.

The Project is located in Tulare County, California, between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake. The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

Timeframe: No timeframe given.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist Tulare ID in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. Editorial comments or other suggestions may also be included to improve the document.

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Based on a review of aerial imagery, the Project description, and a review of California Natural Diversity Database (CNDDB) records, several special status species and habitat types could potentially be impacted by Project activities. Project-related construction activities within the Project alignment and surrounding area could impact the State threatened and federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*); the State threatened Swainson's hawk (*Buteo swainsoni*); the State and federally endangered least Bell's vireo (*Vireo bellii pusillus*); the State threatened tricolored blackbird (*Agelaius tricolor*); the State threatened and fully protected Bald eagle (*Haliaeetus leucocephalus*); the State fully protected golden eagle (*Aquila chrysaetos*); the State endangered foothill yellow-legged frog (*Rana boylii*); the State candidate endangered Crotch bumble bee (*Bombus crotchii*); the State endangered and federally threatened San Joaquin adobe sunburst (*Pseudobahia peirsonii*); the California rare plant rank 1B.2 recurved larkspur (*Delphinium recurvatum*), spiny-sepaled button-celery (*Eryngium spinosepalum*), and calico monkeyflower (*Diplacus pictus*); and the State species of special concern American badger (*Taxidea taxus*), western pond turtle (*Emys marmorata*), pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), western red bat (*Lasiurus blossevillii*), burrowing owl (*Athene cunicularia*), Northern California legless lizard (*Anniella pulchra*), and western spadefoot (*Spea hammondii*).

Vegetation communities and habitats in the Project vicinity includes Valley sacaton grassland, Great Valley oak riparian forest, sycamore alluvial woodland, irrigated row crops, vineyards, orchards and field crops, non-native annual grassland, ruderal disturbed areas, and barren unvegetated areas including levee roads. Aquatic features in and near the Project area include the Kaweah and St. Johns Rivers and associated riparian and fresh emergent wetlands, recharge basins, detention basins, agricultural ditches and canals, and agricultural ponds.

Please note that the CNDDB is populated by and records voluntary submissions of species detections. As a result, species may be present in locations not depicted in the CNDDB but where there is suitable habitat and features capable of supporting species. Therefore, a lack of an occurrence record in the CNDDB is not tantamount to a negative species finding.

The NOP acknowledges the potential to adversely affect special status species. CDFW recommends that the following modifications and/or edits be incorporated into the EIR.

I. Mitigation Measure or Alternative and Related Impact Shortcoming

Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or the United States Fish and Wildlife Service (USFWS)?

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COMMENT 1: San Joaquin Kit Fox (SJKF)

Issue: SJKF occurrences have been documented within the Project area (CDFW 2020). Review of recent aerial imagery shows suitable habitat for SJKF in the Project area. SJKF den in right-of-ways, agricultural and fallow/ruderal habitat, dry stream channels, and canal levees, etc., and populations can fluctuate over time. SJKF are also capable of occupying urban environments (Cypher and Frost 1999). SJKF may be attracted to project areas due to the type and level of ground-disturbing activities and the loose, friable soils resulting from intensive ground disturbance. SJKF will forage in fallow and agricultural fields and utilize streams and canals as dispersal corridors. As a result, there is potential for SJKF to occupy all suitable habitat within the Project boundary and surrounding area.

Specific impact: Without appropriate avoidance and minimization measures for SJKF, potential significant impacts associated with construction include habitat loss, den collapse, inadvertent entrapment, reduced reproductive success, reduction in health and vigor of young, and direct mortality of individuals.

Evidence impact is potentially significant: Habitat loss resulting from land conversion to agricultural, urban, and industrial development is the primary threat to SJKF (Cypher *et al*. 2013). Tulare and Kern Counties support relatively large areas of high suitability habitat and one of the largest remaining populations of SJKF (Cypher *et al*. 2013). The Project area is within and bordered by this remaining highly suitable habitat, which is otherwise intensively managed for agriculture. Therefore, subsequent ground-disturbing activities have the potential to significantly impact local SJKF populations.

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to SJKF associated with subsequent land conversion, ground disturbance and construction, CDFW recommends conducting the following evaluation of project areas and implementing the following mitigation measures.

Recommended Mitigation Measure 1: SJKF Habitat Assessment

For all Project-specific components including construction and land conversion, CDFW recommends that a qualified biologist conduct a habitat assessment in advance of project implementation, to determine if the Project area or its immediate vicinity contains suitable habitat for SJKF.

Recommended Mitigation Measure 2: SJKF Surveys and Avoidance

CDFW recommends assessing presence/absence of SJKF by having qualified biologists conducting surveys of Project areas and a 500-foot buffer of Project areas

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to detect SJKF and their sign. CDFW also recommends following the USFWS "Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance" (2011).

Recommended Mitigation Measure 3: SJKF Take Authorization

SJKF detection warrants consultation with CDFW to discuss how to avoid take or, if avoidance is not feasible, to acquire an Incidental Take Permit (ITP) prior to ground-disturbing activities, pursuant to Fish and Game Code section 2081 subdivision (b).

COMMENT 2: Swainson's Hawk (SWHA)

Issue: Review of recent aerial imagery indicates that trees capable of supporting nesting SWHA occur along the streams and canals within the Project boundary. Landscape trees may also provide suitable nesting habitat. In addition, grassland and agricultural land in the surrounding area provide suitable foraging habitat for SWHA, increasing the likelihood of SWHA occurrence within the vicinity.

Specific impact: Without appropriate avoidance and minimization measures for SWHA, potential significant impacts associated with Project activities include loss of forging and/or nesting habitat, nest abandonment, reduced reproductive success, and reduced health and vigor of eggs and/or young.

Evidence impact would be significant: Lack of suitable nesting habitat in the San Joaquin Valley limits the local distribution and abundance of SWHA (CDFW 2016). The trees and riparian habitat within the Project area represent some of the only remaining suitable nesting habitat in the local vicinity. Depending on the timing of construction, activities including noise, vibration, and movement of workers or equipment could affect nests and have the potential to result in nest abandonment, significantly impacting local nesting SWHA. In addition, agricultural cropping patterns can directly influence distribution and abundance of SWHA. For example, SWHA can forage in grasslands, pasture, hay crops, and low growing irrigated crops; however, other agricultural crops such as orchards and vineyards are incompatible with SWHA foraging (Estep 2009, Swolgaard *et al*. 2008).

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to SWHA associated with subsequent development, CDFW recommends conducting the following evaluation of Project areas and implementing the following mitigation measures.

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Recommended Mitigation Measure 4: Focused SWHA Surveys

To evaluate potential Project-related impacts, CDFW recommends that a qualified wildlife biologist conduct surveys for nesting SWHA following the entire survey methodology developed by the SWHA Technical Advisory Committee (2000) prior to Project initiation.

Recommended Mitigation Measure 5: SWHA Nest Avoidance

CDFW recommends that if Project activities will take place during the SWHA nesting season (March 1 through August 31) and active SWHA nests are present, a minimum ½-mile no-disturbance buffer be maintained around each nest until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival, to prevent nest abandonment and other take of SWHA as a result of Project activities.

Recommended Mitigation Measure 6: SWHA Take Authorization

If implementation of a ½-mile no-disturbance nest buffer around active nests is not feasible, consultation with CDFW is warranted to determine if the Project can avoid take. If SWHA cannot be avoided, acquisition of an ITP pursuant to Fish and Game Code section 2081 subdivision (b) prior to the start of Project activity is warranted to comply with CESA.

Recommended Mitigation Measure 7: SWHA Tree Replacement

CDFW recommends that the removal of known SWHA or other raptor nest trees, even outside of the nesting season, be replaced with an appropriate native tree species planting at a ratio of 3:1 at or near the Project area or in another area that will be protected in perpetuity. This mitigation would offset the temporal impacts of nesting habitat loss.

COMMENT 3: Least Bell's Vireo (LBV)

Issue: Review of aerial imagery indicates the presence of riparian woodland vegetation suitable to support LBV, within the Project site and its vicinity

Specific impact: Without appropriate avoidance and minimization measures for LBV, potential significant impacts associated with Project development include nest abandonment, reduced reproductive success, and reduced health and vigor of eggs and/or young.

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Evidence impact is potentially significant: LBV were abundant and widespread in the United States until the 1950s (Grinnell and Miller 1944). By the 1960s, they were considered scarce (Monson 1960), and by 1980 there were fewer than 50 pairs remaining (Edwards 1980), although this number had increased to 2,500 by 2004 (Kus and Whitfield 2005). The primary cause of decline for this species has been the loss and alteration of riparian woodland habitats (USFWS 2006). Fragmentation of their preferred habitat has also increased their exposure to brown- headed cowbird (*Molothrus ater*) parasitism (Kus and Whitfield 2005). Current threats to their preferred habitat include colonization by non-native plants and altered hydrology (diversion, channelization, etc.) (USFWS 2006).

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to LBV, CDFW recommends conducting the following evaluation of the Project site, incorporating the following mitigation measures into the EIR, and that these measures be made conditions of approval for the Project.

Recommended Mitigation Measure 8: LBV Habitat Assessment

CDFW recommends that a qualified biologist conduct a habitat assessment in advance of Project implementation, to determine if the Project site or its immediate vicinity contains suitable habitat for LBV.

Recommended Mitigation Measure 9: LBV Avoidance

CDFW recommends that Project activities be timed to avoid the typical bird breeding season (February 1 through September 15).

Recommended Mitigation Measure 10: LBV Surveys

If Project activities must take place during the typical bird breeding season, and suitable LBV habitat is detected during habitat assessments, CDFW recommends assessing presence/absence of LBV by conducting surveys following the USFWS "Least Bell's Vireo Survey Guidelines" (2001) in advance of the start of Project implementation, to evaluate presence/absence of LBV nesting in proximity to Project activities, and to evaluate potential Project-related impacts and permitting needs.

Recommended Mitigation Measure 11: LBV Take Authorization

LBV detection warrants consultation with CDFW to discuss how to avoid take, or if avoidance is not feasible, to acquire an ITP prior to Project activities, pursuant to Fish and Game Code section 2081 subdivision (b).

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COMMENT 4: Tricolored Blackbird (TRBL)

Issue: TRBL are known to occur in the Project vicinity (CDFW 2020, UC Davis 2020). Review of aerial imagery indicates that the Project boundary includes flood-irrigated agricultural land, which is an increasingly important nesting habitat type for TRBL, particularly in the San Joaquin Valley (Meese *et al*. 2017).

Specific impact: Without appropriate avoidance and minimization measures for TRBL, potential significant impacts associated subsequent development include nesting habitat loss, nest and/or colony abandonment, reduced reproductive success, and reduced health and vigor of eggs and/or young.

Evidence impact would be significant: As mentioned above, flood-irrigated agricultural land is an increasingly important nesting habitat type for TRBL, particularly in the San Joaquin Valley (Meese *et al*. 2014). This nesting substrate is present within the Project vicinity. TRBL aggregate and nest colonially, forming colonies of up to 100,000 nests (Meese *et al*. 2014). Approximately 86% of the global population is found in the San Joaquin Valley (Kelsey 2008, Weintraub *et al*. 2016). In addition, TRBL have been forming larger colonies that contain progressively larger proportions of the species' total population (Kelsey 2008). In 2008, for example, 55% of the species' global population nested in only two colonies, which were located in silage fields (Kelsey 2008). Nesting can occur synchronously, with all eggs laid within one week (Orians 1961). For these reasons, depending on timing, disturbance to nesting colonies can cause nest entire colony site abandonment and loss of all unfledged nests, significantly impacting TRBL populations (Meese *et al*. 2014).

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to TRBL associated with subsequent development, CDFW recommends conducting the following evaluation of Project areas and implementing the following mitigation measures.

Recommended Mitigation Measure 12: TRBL Surveys

CDFW recommends that Project activities be timed to avoid the typical bird-breeding season of February 1 through September 15. If Project activity that could disrupt nesting must take place during that time, CDFW recommends that a qualified wildlife biologist conduct surveys for nesting TRBL no more than 10 days prior to the start of implementation to evaluate presence/absence of TRBL nesting colonies in proximity to Project activities and to evaluate potential Project-related impacts.

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Recommended Mitigation Measure 13: TRBL Colony Avoidance

If an active TRBL nesting colony is found during preactivity surveys, CDFW recommends implementation of a minimum 300-foot no-disturbance buffer, in accordance with CDFW's "Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields in 2015" (CDFW 2015), until the breeding season has ended or until a qualified biologist has determined that nesting has ceased and the young have fledged and are no longer reliant upon the colony or parental care for survival. It is important to note that TRBL colonies can expand over time and for this reason, CDFW recommends that an active colony be reassessed to determine its extent within 10 days prior to Project initiation.

Recommended Mitigation Measure 14: TRBL Take Authorization

In the event that a TRBL nesting colony is detected during surveys, consultation with CDFW is warranted to discuss whether the Project can avoid take; if take avoidance is not feasible, to acquire an ITP pursuant to Fish and Game Code section 2081 subdivision (b), prior to any Project activities.

COMMENT 5: Nesting Bald Eagle (BAEA) and Golden Eagle (GOEA)

Issue: Nesting BAEA and GOEA have the potential to occur in the Project area and its vicinity, including the Kaweah River and St. Johns River corridors.

Specific impact: Without appropriate avoidance and minimization measures, potentially significant impacts associated with the Project's construction include loss of foraging and/or nesting habitat, nest abandonment, reduced reproductive success, and reduced health and vigor of eggs and/or young.

Evidence impact would be significant: Without appropriate survey methods, eagles nesting in the vicinity of a project can remain undetected resulting in avoidance and minimization measures not being effectively implemented (American Eagle Research Institute 2010). In addition, human activity near nest sites can cause reduced provisioning rates of GOEA chicks by adults (Steidl *et al*. 1993 *in* Kochert *et al*. 2002). Depending on the timing of construction, Project activities including noise, vibration, odors, and movement of workers or equipment could affect nests and also have the potential to result in nest abandonment, significantly impacting local nesting raptors.

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Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to roosting or nesting eagles associated with Project construction, CDFW recommends conducting the following evaluation of the Project area and including the following mitigation measures as conditions of approval.

Recommended Mitigation Measure 15: Focused Surveys for Nesting Eagles

CDFW recommends that a qualified wildlife biologist conduct surveys for nesting raptors following the Protocol for Golden Eagle Occupancy, Reproduction, and Prey Population Assessment (Driscoll 2010), and the Protocol for Evaluating Bald Eagle Habitat and Populations in California (Jackman and Jenkins 2004). If ground-disturbing activities take place during the typical bird breeding season (February 1 through September 15), CDFW recommends that additional pre-construction surveys for active nests be conducted by a qualified biologist no more than 10 days prior to the start of construction.

Recommended Mitigation Measure 16: Nesting Eagle Avoidance

If an active raptor nest is found, CDFW recommends implementation of a minimum ½-mile no-disturbance buffer until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival. If nesting raptors are detected and the ½-mile no-disturbance nest buffer is not feasible, consultation with CDFW is warranted to determine if the Project can avoid take. Please note that BAEA and GOEA are State fully protected species and no take, incidental or otherwise, of those species can be authorized by CDFW.

COMMENT 6: Burrowing Owl (BUOW)

Issue: BUOW occur within and in the vicinity of the Project area (CDFW 2020). BUOW inhabit open grassland containing small mammal burrows, a requisite habitat feature used by BUOW for nesting and cover. Habitat both within and bordering the Project supports grassland habitat.

Specific impact: Potentially significant direct impacts associated with Project development include habitat loss, burrow collapse, inadvertent entrapment, nest abandonment, reduced reproductive success, reduction in health and vigor of eggs and/or young, and direct mortality of individuals.

Evidence impact is potentially significant: BUOW rely on burrow habitat year-round for their survival and reproduction. Habitat loss and degradation are considered the greatest threats to BUOW in California's Central Valley (Gervais *et al*. 2008). The Project area contains remnant undeveloped land but is otherwise

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intensively managed for agriculture; therefore, subsequent ground-disturbing activities associated with subsequent constructions have the potential to significantly impact local BUOW populations. In addition, and as described in CDFW's "*Staff Report on Burrowing Owl Mitigation*" (CDFG 2012), excluding and/or evicting BUOW from their burrows is considered a potentially significant impact under CEQA.

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to BUOW associated with subsequent development, CDFW recommends conducting the following evaluation of Project areas and implementing the following mitigation measures.

Recommended Mitigation Measure 17: BUOW Habitat Assessment and Surveys

CDFW recommends that a qualified biologist conduct a habitat assessment in advance of Project implementation, to determine if the Project area or its vicinity contains suitable habitat for BUOW. If suitable habitat is present on or in the vicinity of the Project area, CDFW recommends assessing presence/absence of BUOW by having a qualified biologist conduct surveys following the California Burrowing Owl Consortium's "*Burrowing Owl Survey Protocol and Mitigation Guidelines*" (1993) and CDFW's *Staff Report on Burrowing Owl Mitigation*" (CDFG 2012). Specifically, these documents suggest three or more surveillance surveys conducted during daylight with each visit occurring at least three weeks apart during the peak breeding season (i.e., April 15 to July 15), when BUOW are most detectable. In addition, CDFW advises that surveys include a minimum 500-foot buffer around the Project area.

Recommended Mitigation Measure 18: BUOW Avoidance

CDFW recommends that no-disturbance buffers, as outlined in the "*Staff Report on Burrowing Owl Mitigation*" (CDFG 2012), be implemented prior to and during any ground-disturbing activities. Specifically, CDFW's Staff Report recommends that impacts to occupied burrows be avoided in accordance with the following table unless a qualified biologist approved by CDFW verifies through non-invasive methods that either: 1) the birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

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Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Recommended Mitigation Measure 19: BUOW Passive Relocation and Mitigation

If BUOW are found within these recommended buffers and avoidance is not possible, it is important to note that according to the Staff Report (CDFG 2012), excluding owls from burrows is not a take avoidance, minimization, or mitigation method and is instead considered a potentially significant impact under CEQA. If it is necessary for Project implementation, CDFW recommends that burrow exclusion be conducted by qualified biologists and only during the non-breeding season, before breeding behavior is exhibited and after the burrow is confirmed empty through non-invasive methods, such as surveillance. CDFW recommends replacement of occupied burrows with artificial burrows at a ratio of 1 burrow collapsed to 1 artificial burrow constructed (1:1) to mitigate for evicting BUOW and the loss of burrows. BUOW may attempt to colonize or re-colonize an area that will be impacted; thus, CDFW recommends ongoing surveillance at a rate that is sufficient to detect BUOW if they return.

COMMENT 7: Foothill Yellow-Legged Frog (FYLF)

Issue: FYLF are primarily stream dwelling and require shallow, flowing water in streams and rivers with at least some cobble-sized substrate. (Thomson *et al*. 2016). FYLF have been documented to occur in the vicinity of the Project site (CDFW 2020). The Project site contains habitat that could support this species.

Specific impact: Without appropriate avoidance and minimization measures for FYLF, potentially significant impacts associated with Project activities could include burrow collapse, inadvertent entrapment, reduced reproductive success, reduction in health and vigor of eggs, larvae and/or young, and direct mortality of individuals.

Evidence impact would be significant: FYLF populations throughout the State have experienced ongoing and drastic declines and many have been extirpated; historically, FYLF occurred in mountain streams from the San Gabriel River in Los Angeles County to southern Oregon west of the Sierra-Cascade crest (Thomson *et al*. 2016). Habitat loss from growth of cities and suburbs, invasion of nonnative plants, impoundments, water diversions, stream maintenance for flood control,

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degraded water quality, and introduced predators, such as bullfrogs are the primary threats to FYLF (Thomson *et al*. 2016).

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to FYLF, CDFW recommends conducting the following evaluation of the Project site, incorporating the following mitigation measures into the EIR, and that these measures be made conditions of approval for the Project.

Recommended Mitigation Measure 20: FYLF Surveys

CDFW recommends that a qualified wildlife biologist conduct surveys for FYLF in accordance with the USFWS *"Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog"* (USFWS 2005) to determine if FYLF are within or adjacent to the Project area. While this survey is designed for California red-legged frog, the survey may be used for FYLF with focus on stream/river habitat.

Recommended Mitigation Measure 21: FYLF Avoidance

CDFW recommends that initial ground-disturbing activities be timed to avoid the period when FYLF are most likely to be moving through upland areas (i.e., November 1 through March 31). If ground-disturbing activities must take place between November 1 and March 31, CDFW recommends that a qualified biologist monitor construction activity daily for FYLF.

Recommended Mitigation Measure 22: FYLF Take Authorization

If through surveys or monitoring it is determined that FYLF occupies or has the potential to occupy the Project site and take cannot be avoided, take authorization would be warranted prior to initiating ground-disturbing activities, through issuance of a State ITP, pursuant to Fish and Game Code section 2081 subdivision (b), prior to any Project activities.

COMMENT 8: Crotch's Bumble Bee (CBB)

Issue: On June 28, 2019, the Fish and Game Commission published findings of its decision to advance CBB to candidacy as endangered. Pursuant to Fish and Game Code section 2074.6, CDFW has initiated a status review report to inform the Commission's decision on whether listing of CBB pursuant to CESA is warranted. During the candidacy period, consistent with CEQA Guidelines, section 15380, the status of the CBB as an endangered candidate species under CESA (Fish and G. Code, § 2050 *et seq*.) qualifies it as an endangered, rare, or threatened species under CEQA.

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CBB have been documented to occur within the vicinity of the Project area (CDFW 2020). Suitable CBB habitat includes areas of grasslands and upland scrub that contain requisite habitat elements, such as small mammal burrows. CBB primarily nest in late February through late October underground in abandoned small mammal burrows, but may also nest under perennial bunch grasses or thatched annual grasses, under brush piles, in old bird nests, and in dead trees or hollow logs (Williams *et al*. 2014; Hatfield et *al*. 2015). Overwintering sites utilized by CBB mated queens include soft, disturbed soil (Goulson 2010), or under leaf litter or other debris (Williams *et al*. 2014). Therefore, ground disturbance and vegetation removal associated with Project implementation has the potential to significantly impact local CBB populations.

Specific impact: Without appropriate avoidance and minimization measures for CBB, potentially significant impacts associated with ground- and vegetation-disturbing activities associated with construction of the Project include loss of foraging plants, changes in foraging behavior, burrow collapse, nest abandonment, reduced nest success, reduced health and vigor of eggs, young and/or queens, in addition to direct mortality.

Evidence impact is potentially significant: CBB was once common throughout most of the central and southern California; however, it now appears to be absent from most of it, especially in the central portion of its historic range within California's Central Valley (Hatfield *et al*. 2014). Analyses by the Xerces Society *et al*. (2018) suggest that there have been sharp declines in relative abundance by 98% and persistence by 80% over the last 10 years.

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to CBB associated with the Project, CDFW recommends incorporating the following mitigation measures into the EIR prepared for this Project and implementing the following mitigation measures as a condition of approval for the Project.

Recommended Mitigation Measure 23: CBB Surveys

CDFW recommends that a qualified biologist conduct focused surveys for CBB and their requisite habitat features to evaluate potential impacts resulting from ground- and vegetation-disturbance associated with the Project, and potential impacts resulting from vegetation removal and discing.

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Recommended Mitigation Measure 24: CBB Take Avoidance

If surveys cannot be completed, CDFW recommends that all small mammal burrows and thatched/bunch grasses be avoided by a minimum of 50 feet to avoid take and other potentially significant impacts.

COMMENT 9: Special-Status Bat Species

Issue: Western mastiff bat have been documented to occur in the vicinity of the Project area (CDFW 2020). In addition, habitat features that have the potential to support Western mastiff bat, Western red bat, pallid bat, and other bat species are present within the Project area.

Specific impact: Without appropriate avoidance and minimization measures for special-status bat species, potential significant impacts resulting from ground- and vegetation-disturbing activities associated with Project construction include habitat loss, inadvertent entrapment, roost abandonment, reduced reproductive success, reduction in health and vigor of young, and direct mortality of individuals.

Evidence impact is potentially significant: Western mastiff bat and pallid bat are known to roost in buildings, caves, tunnels, cliffs, crevices, trees. (Lewis 1994). Western red bat is highly associated with riparian habitat (Peirson *et al*. 2006). Project activities have the potential to affect habitat upon which special-status bat species depend for successful breeding and have the potential to impact individuals and local populations.

Recommended Potentially Feasible Mitigation Measure(s)
CDFW recommends that the EIR include the following measures and that these be made conditions of approval for the Project.

Recommended Mitigation Measure 25: Bat Roost Habitat Assessment

CDFW recommends that a qualified biologist conduct a habitat assessment well in advance of Project implementation to determine if the Project area or its immediate vicinity contains suitable roosting habitat for special-status bat species.

Recommended Mitigation Measure 26: Bat Surveys

If suitable habitat is present, CDFW recommends assessing presence/absence of special-status bat roosts by conducting surveys during the appropriate seasonal period of bat activity. CDFW recommends methods such as through emergence surveys or bat detectors to determine whether bats are present.

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Recommended Mitigation Measure 27: Bat Roost Disturbance Minimization and Avoidance

If bats are present, CDFW recommends that a 100-foot no-disturbance buffer be placed around the roost and that a qualified biologist who is experienced with bats monitor the for signs of disturbance to bats from Project activity. If a bat roost is identified and work is planned to occur during the breeding season, CDFW recommends that no disturbance to maternity roosts occurs and that CDFW be consulted to determine measures to prevent breeding disruption or failure.

COMMENT 10: Western Pond Turtle (WPT)

Issue: WPT are documented in the vicinity of the Project (CDFW 2020), and a review of aerial imagery shows requisite habitat features that WPT utilize for nesting, overwintering, dispersal, and basking occur in the Project area. These features include aquatic and terrestrial habitats such as rivers, lakes, reservoirs, ponded areas, irrigation canals, riparian and upland habitat. WPT are known to nest in the spring or early summer within 100 meters of a water body, although nest sites as far away as 500 meters have also been reported (Thomson *et al*. 2016).

Specific impact: Without appropriate avoidance and minimization measures for WPT, potentially significant impacts associated with Project activities could include nest reduction, inadvertent entrapment, reduced reproductive success, reduction in health or vigor of eggs and/or young, and direct mortality.

Evidence impact is potentially significant: WPT are known to nest in the spring or early summer within 100 meters of a water body, although nest sites as far away as 500 meters have also been reported (Thomson *et al*. 2016). Noise, vegetation removal, movement of workers, construction and ground disturbance as a result of Project activities have the potential to significantly impact WPT populations.

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to WPT, CDFW recommends conducting the following evaluation of the Project site, and to including the following measures in the EIR.

Recommended Mitigation Measure 28: WPT Surveys

CDFW recommends that a qualified biologist conduct focused surveys for WPT within ten10 days prior to Project implementation. In addition, CDFW recommends that focused surveys for nests occur during the egg-laying season (i.e., March through August).

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Recommended Mitigation Measure 29: WPT Avoidance and Minimization

CDFW recommends that any WPT nests that are discovered remain undisturbed with a no-disturbance buffer maintained around the nest until the eggs have hatched and neonates are no longer in the nest or Project areas. If WPT individuals are discovered at the site during surveys or Project activities, CDFW recommends that they be allowed to move out of the area on their own volition without disturbance or harm.

COMMENT 11: Special-Status Plants

Issue: Special-status plants meeting the definition of rare or endangered under CEQA section 15380 are known to occur in the vicinity of the Project. The State endangered and federally threatened San Joaquin adobe sunburst and California rare plant rank 1B.2 recurved larkspur, spiny-sepaled button-celery, and calico monkeyflower have been documented within the Project area.

Specific impact: Without appropriate avoidance and minimization measures for special-status plants, potential significant impacts associated with subsequent construction include loss of habitat, loss of reduction of productivity, and direct mortality.

Evidence impact would be significant: San Joaquin adobe sunburst, recurved larkspur, spin-sepaled button-celery, and calico monkeyflower are threatened by grazing and agricultural, urban, and energy development. Many historical occurrences of these species are presumed extirpated (California Native Plant Society 2020). Though new populations have recently been discovered, impacts to existing populations have the potential to significantly impact populations of plant species.

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to special-status plants associated with subsequent development, CDFW recommends conducting the following evaluation of Project areas and implementing the following mitigation measures.

Recommended Mitigation Measure 30: Special-Status Plant Surveys

CDFW recommends that individual Project sites be surveyed for special-status plants by a qualified botanist following the “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities” (CDFW 2018). This protocol, which is intended to maximize detectability, includes the identification of reference populations to facilitate the likelihood of field investigations occurring during the appropriate floristic period.

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Recommended Mitigation Measure 31: Special-Status Plant Avoidance

CDFW recommends that special-status plant species be avoided whenever possible by delineating and observing a no-disturbance buffer of at least 50 feet from the outer edge of the plant population(s) or specific habitat type(s) required by special-status plant species. If buffers cannot be maintained, then consultation with CDFW may be warranted to determine appropriate minimization and mitigation measures for impacts to each special-status plant species.

Recommended Mitigation Measure 32: Special-Status Plant Take Authorization

If a State-listed plant species is identified during botanical surveys, consultation with CDFW is warranted to determine if the Project can avoid take. If take cannot be avoided, take authorization would be warranted. Take authorization would occur through issuance of an ITP by CDFW, pursuant to Fish and Game Code section 2081 subdivision (b).

COMMENT 12: Other State Species of Special Concern

Issue: Western spadefoot, Northern California legless lizard, and American badger can inhabit grassland and upland scrub habitats (Thomson *et al*. 2016, Williams 1986). These special status species have been documented to occur in the vicinity of the Project boundary, which supports requisite habitat elements for these species (CDFW 2020).

Specific impact: Without appropriate avoidance and minimization measures for these species, potentially significant impacts associated with ground disturbance include habitat loss or nest/den/burrow abandonment, which may result in reduced health or vigor of individuals and direct mortality.

Evidence impact is potentially significant: Habitat loss threatens of the species mentioned above (Thomson *et al*. 2016, Williams 1986). Habitat within and adjacent to the Project represents some of the only remaining undeveloped land in the vicinity, which is otherwise intensively managed for agriculture. Ground- and vegetation-disturbing activities associated with the Project have the potential to significantly impact local populations of these species.

Recommended Potentially Feasible Mitigation Measures
To evaluate potential impacts to special-status species associated with subsequent development, CDFW recommends conducting the following evaluation of project areas and implementing the following mitigation measures.

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Recommended Mitigation Measure 33: Special-Status Species Habitat Assessment

CDFW recommends that a qualified biologist conduct a habitat assessment in advance of project implementation, to determine if project areas or their immediate vicinity contain suitable habitat for the species mentioned above.

Recommended Mitigation Measure 34: Special-Status Species Surveys

If suitable habitat is present, CDFW recommends that a qualified biologist conduct focused surveys for applicable species and their requisite habitat features prior to the start of Project activity to detect individuals that could be impacted from ground- and vegetation-disturbance.

Recommended Mitigation Measure 35: Special-Status Species Avoidance or Minimization

Avoidance whenever possible is encouraged via delineation and observance of a 50-foot no-disturbance buffer around dens of mammals like the American badger, as well as the entrances of burrows that can provide refuge for small mammals, reptiles, and amphibians.

Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS?

COMMENT 13: Wetland and Riparian Habitats

Issue: The Project area contains numerous waterways and riparian and wetland areas. Development within the Project has the potential to involve temporary and permanent impacts to these features.

Specific impact: Project activities have the potential to result in the loss of riparian and wetland vegetation, in addition to the degradation of wetland and riparian areas through grading, fill, and related development.

Evidence impact is potentially significant: The Project area includes stream and wetland features within an agricultural landscape that also maintains undeveloped habitats. Riparian and associated floodplain and wetland areas are valuable for their ecosystem processes such as protecting water quality by filtering pollutants and transforming nutrients; stabilizing stream banks to prevent erosion and sedimentation/siltation; and dissipating flow energy during flood conditions, thereby spreading the volume of surface water, reducing peak flows downstream, and

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increasing the duration of low flows by slowly releasing stored water into the channel through subsurface flow. Within the San Joaquin Valley, modifications of streams to accommodate human uses has resulted in damming, canalizing, and channelizing of many streams, though some natural stream channels and small wetland or wetted areas remain (Edminster 2002). The Fish and Game Commission policy regarding wetland resources discourages development or conversion of wetlands that results in any net loss of wetland acreage or habitat value. Construction activities within these features also has the potential to impact downstream waters as a result of Project site impacts leading to erosion, scour, and changes in stream morphology.

Recommended Potentially Feasible Mitigation Measure(s)
To evaluate potential impacts to wetland and riparian habitats, CDFW recommends conducting the following evaluation of Project areas and implementing the following mitigation measures.

Recommended Mitigation Measure 37: Stream and Wetland Mapping

CDFW recommends that formal stream mapping and wetland delineation be conducted by a qualified biologist or hydrologist, as warranted, to determine the baseline location, extent, and condition of streams (including any floodplain) and wetlands within and adjacent to the Project area. Please note that while there is overlap, State and Federal definitions of wetlands differ, and complete stream mapping commonly differs from delineations used by the U.S. Army Corps of Engineers specifically to identify the extent of Waters of the U.S. Therefore, it is advised that the wetland delineation identify both State and Federal wetlands in the Project area as well as the extent of all streams including floodplains, if present, within the Project area. CDFW advises that site map(s) depicting the extent of any activities that may affect wetlands, lakes, or streams be included with any Project site evaluations, to clearly identify areas where stream/riparian and wetland habitats could be impacted from Project activities.

Recommended Mitigation Measure 38: Stream and Wetland Habitat Mitigation

CDFW recommends that the potential direct and indirect impacts to stream/riparian and wetland habitat be analyzed according to each Project activity. Based on those potential impacts, CDFW recommends that the EIR include measures to avoid, minimize, and/or mitigate those impacts. CDFW recommends that impacts to riparian habitat (i.e., biotic and abiotic features) take into account the effects to stream function and hydrology from riparian habitat loss or damage, as well as potential effects from the loss of riparian habitat to special-status species already identified herein. CDFW recommends that losses to stream and wetland habitats be offset with corresponding riparian and wetland habitat restoration incorporating native vegetation to replace the value to fish and wildlife provided by the habitats lost

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from Project implementation. If on-site restoration to replace habitats is not feasible, CDFW recommends offsite mitigation by restoring or enhancing in-kind riparian or wetland habitat and providing for the long-term management and protection of the mitigation area, to ensure its persistence.

II. Editorial Comments and/or Suggestions

Federally Listed Species: CDFW recommends consulting with the USFWS regarding potential impacts to federally listed species including, but not limited to, SJKF, LBV, and San Joaquin adobe sunburst. Take under the Federal Endangered Species Act (FESA) is more broadly defined than CESA; take under FESA also includes significant habitat modification or degradation that could result in death or injury to a listed species by interfering with essential behavioral patterns such as breeding, foraging, or nesting. Consultation with the USFWS in order to comply with FESA is advised well in advance of any Project activities.

Lake and Streambed Alteration: Project activities have the potential to substantially change the bed, bank, and channel of waterways onsite. Jurisdictional Project activities are subject to the notification requirement of Fish and Game Code section 1602, which requires an entity to notify CDFW prior to commencing any activity that may (a) substantially divert or obstruct the natural flow of any river, stream, or lake; (b) substantially change or use any material from the bed, bank, or channel of any river, stream, or lake (including the removal of riparian vegetation); (c) deposit debris, waste or other materials that could pass into any river, stream, or lake. "Any river, stream, or lake" includes those that are ephemeral or intermittent as well as those that are perennial. CDFW is required to comply with CEQA in the issuance of a Lake or Streambed Alteration Agreement (Agreement); therefore, if the CEQA document approved for the Project does not adequately describe the Project and its impacts, a subsequent CEQA analysis may be necessary for Agreement issuance. For additional information on notification requirements, please contact staff in the Central Region Lake and Streambed Alteration Program at (559) 243-4593 or R4LSA@willife.ca.gov, of the Program website: https://wildlife.ca.gov/Conservation/LSA.

Nesting birds: CDFW has jurisdiction over actions with potential to result in the disturbance or destruction of active nest sites or the unauthorized take of birds. Fish and Game Code sections that protect birds, their eggs and nests include sections 3503 (regarding unlawful take, possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the take, possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful take of any migratory nongame bird).

CDFW encourages Project implementation to occur during the bird non-nesting season; however, if Project activities must occur during the breeding season (February through mid-September), the Project proponent is responsible for ensuring that implementation

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of the Project does not result in violation of the Migratory Bird Treaty Act or relevant Fish and Game Codes as referenced above.

To evaluate Project-related impacts on nesting birds, CDFW recommends that a qualified wildlife biologist conduct pre-activity surveys for active nests no more than 10 days prior to the start of each Project activity to maximize the probability that nests that could potentially be impacted by the Project are detected. CDFW also recommends that surveys cover a sufficient area around the work site to identify nests and determine their status. A sufficient area means any area potentially affected by a project. In addition to direct impacts (i.e. nest destruction), noise, vibration, and movement of workers or equipment could also affect nests. Prior to initiation of construction activities, CDFW recommends that a qualified biologist conduct a survey to establish a behavioral baseline of all identified nests. Once construction begins, CDFW recommends that a qualified biologist continuously monitor nests to detect behavioral changes resulting from the project. If behavioral changes occur, CDFW recommends that the work causing that change cease and CDFW be consulted for additional avoidance and minimization measures.

If continuous monitoring of identified nests by a qualified wildlife biologist is not feasible, CDFW recommends a minimum no-disturbance buffer of 250 feet around active nests of non-listed bird species and a 500-foot no-disturbance buffer around active nests of non-listed raptors. These buffers are advised to remain in place until the breeding season has ended or until a qualified biologist has determined that the birds have fledged and are no longer reliant upon the nest or parental care for survival. Variance from these no-disturbance buffers is possible when there is compelling biological or ecological reason to do so, such as when the construction area would be concealed from a nest site by topography. CDFW recommends that a qualified wildlife biologist advise and support any variance from these buffers and notify CDFW in advance of implementing a variance.

Indirect and Cumulative Riparian Impacts from Surface Water Diversions: Project-related diversions may impact riparian, wetland, fisheries, and terrestrial (i.e., upland) wildlife species and habitats downstream of the Project location by reducing the amount of surface flow in the active stream channel at the discharge location and downstream, as well as reducing the amount of subsurface flow from percolation

Watershed and habitat protection are vital to CDFW's management of California's diverse fish, wildlife, and plant resources. The riparian zone of the Kaweah and St. Johns Rivers in the vicinity of the Project supports mature riparian woodland habitat and may potentially support several sensitive species listed as threatened or endangered under CESA and FESA, as well as several State Species of Special Concern, including those species listed above. The proposed Project could result in direct and cumulative adverse impacts to these fish and wildlife and other public trust resources.

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The Sequoia Riverlands Trust manages the Kaweah Oaks Preserve located downstream of the proposed Project. The Kaweah Oaks Preserve is 344 acres and contains some of the last remaining Valley oak riparian forests in the San Joaquin Valley. Project-related activities resulting in surface water diversion may potentially impact these properties and sensitive habitats and special-status plant and wildlife species including Valley sacaton grassland, Great Valley oak riparian forest, least Bell's vireo, Swainson's hawk, tricolored blackbird, and numerous other special-status species (CDFW 2020).

Surface flow diversion may impact the riparian woodland habitat located downstream by reducing the amount of water available in the active channel to native plant species within the riparian woodland. This may subsequently lead to a reduction in the native plant species composition of the riparian woodland, which would allow adjacent nonnative plant species to invade and colonize the habitat, reducing the quality of habitat for and presence of sensitive species.

CDFW recommends that the EIR include 1) an analysis of the proposed acquisition of surface water and any potential direct, indirect, and cumulative biological impacts to fish and wildlife species and their habitats, as well as to properties permanently conserved to protect those resources; and 2) a hydrologic study to determine if the production of the watershed is sufficient to reduce the discharge flows, as proposed, without having significant adverse impacts to riparian and aquatic resources of watershed downstream, including the invasion and establishment of nonnative plant species and change in habitat type.

Water Rights: The Project will divert surface flow from the Kaweah and St. Johns Rivers. CDFW recommends that the draft EIR include a detailed description of the water rights and water entitlements for the points of diversion and places of use that pertain to the proposed Project. CDFW recommends including information on the historic and current water rights and water use agreements/contracts including pre-1914 and appropriative rights, riparian rights, prescriptive rights, and adjudications.

CDFW recommends that the draft EIR address whether the Project proponents will be filing a change petition or a new application for additional surface water. As stated previously, CDFW, as Trustee Agency, is consulted by the SWRCB during the water rights process to provide terms and conditions designed to protect fish and wildlife prior to appropriation of the State's water resources. Given the potential for significant impacts to sensitive species and their habitats, it is advised that required consultation with CDFW occur well in advance of the SWRCB water right application process.

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ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database, which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)). Accordingly, please report any special status species and natural communities detected during Project surveys to the CNDDB. The CNDDB field survey form can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_FieldSurveyForm.pdf. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089).

CONCLUSION

CDFW appreciates the opportunity to comment on the NOP to assist the Tulare ID in identifying and mitigating Project impacts on biological resources. Questions regarding this letter or further coordination should be directed to Annette Tenneboe, Senior Environmental Scientist (Specialist), at (559) 243-4014 extension 231 or by email at annette.tenneboe@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Bob Stafford
5343A684FF02469...

Julie A. Vance
Regional Manager

cc: Office of Planning and Research, State Clearinghouse, Sacramento

ec: Annette Tenneboe
California Department of Fish and Wildlife

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REFERENCES

American Eagle Research Institute (AERI). 2010. Protocol for golden eagle occupancy, reproduction, and pretty population assessment.

California Burrowing Owl Consortium. 1993. Burrowing owl survey protocol and mitigation guidelines. Pages 171-177 *in* Lincer, J. L. and K. Steenhof (editors). 1993. The burrowing owl, its biology and management. Raptor Research Report Number 9.

California Department of Fish and Game. 2012. Staff Report on Burrowing Owl Mitigation. California Department of Fish and Game. March 7, 2012.

California Department of Fish and Wildlife (CDFW). 2015. Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields in 2015. March 19, 2015.

CDFW. 2016. Status Review: Swainson's hawk (*Buteo swainsoni*) in California. Reported to California Fish and Game Commission. Five years status report.

CDFW. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. California Department of Fish and Wildlife. March 20, 2018.

CDFW. 2020. Biogeographic Information and Observation System (BIOS). https://www.wildlife.ca.gov/Data/BIOS. Accessed October 27, 2020.

California Native Plant Society. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org. Accessed October 27, 2020.

Cypher, B. and N. Frost. 1999. Condition of San Joaquin kit foxes in urban and exurban habitats. Journal of Wildlife Management 63: 930–938.

Cypher, B.L., S.E. Phillips, and P.A. Kelly. 2013. Quantity and distribution of suitable habitat for endangered San Joaquin kit foxes: conservation implications. Canid Biology & Conservation 16(7): 25-31. http://www.canids.org/CBC/16/San_Joaquin_kit_fox_habitat_suitability.pdf

Driscoll, D. 2010. Protocol for Golden Eagle Occupancy, Reproduction, and Prey Population Assessment. American Eagle Research Institute, Apache Jct., AZ. 55pp.

DocuSign Envelope ID: 8814B58A-F4E7-48EB-85C5-0989B914FF65

Edminster, R.J. 2002. Streams of the San Joaquin. Second Edition. Quercus Publications, Los Banos, California.

Edwards, C. L. 1980. A report on the distribution, population trends and habitat trends and habitat requirements of the Bell's vireo on the Lower Colorado River. Yuma District Office of the Bureau of Land Management, Arizona Fish and Game Department, Yuma, AZ, USA.

Estep, J. 2009. The influence of vegetation structure on Swainson's hawk (*Buteo swainsoni*) foraging habitat suitability in Yolo County, California. Prepared for the Yolo Natural Heritage Program, Woodland, CA.

Gervais, J. A., D. K. Rosenberg, and L. A. Comrack. 2008. Burrowing Owl (*Athene cunicularia*) *In* California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California (W. D. Shuford and T. Gardali, editors). Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Goulson, D. 2010. Bumblebees: behaviour, ecology, and conservation. Oxford University Press, New York. 317pp.

Grinnell, J. and A. H. Miller. 1944. The Distribution of Birds of California. Pacific Coast Avifauna 27. Cooper Ornithological Club, Berkeley, CA, USA.

Hatfield, R, S. Colla, S. Jepsen, L. Richardson, R. Thorp, and S. F. Jordan. 2014. Draft IUCN Assessments for North American *Bombus* spp. for the North American IUCN Bumble Bee Specialist Group. The Xerces Society for Invertebrate Conservation, www.xerces.org, Portland, OR.

Hatfield, R., S. Jepsen, R. Thorp, L. Richardson. and S. Colla. 2015. Bombus crotchii. The IUCN Red List of Threatened Species. http://dx.doi.org/10.2305/IUCN.UK.2015--2.RLTS.T44937582A46440211.en. Accessed October 27, 2020.

Jackman, R.E. and J.M. Jenkins. 2004. Protocol for Evaluating Bald Eagle Habitat and Populations in California. Prepared for U.S. Fish and Wildlife Servicem Endangered Species Division, Sacramento, CA, USA.

Kelsey, R. 2008. Results of the tricolored blackbird 2008 census. Report submitted to U.S. Fish and Wildlife Service, Portland, OR, USA.

DocuSign Envelope ID: 8814B58A-F4E7-48EB-85C5-0989B914FF65

Kus, B. E., and M. J. Whitfield. 2005. Parasitism, productivity, and population growth: Response of least Bell's vireos (*Vireo bellii extimus*) and Southwestern Willow Flycatchers (*Empidonax traillii extimus*) to cowbird (*Molothrus* spp.) control. Ornithological Monographs 57:16–27.

Lewis, S. E. 1994. Night roosting ecology of pallid bats (*Antrozous pallidus*) in Oregon. The American Midland Naturalist, Vol. 132, pp. 219-226.

Meese, R. J., E. C. Beedy, and W. J. Hamilton, III. 2014. Tricolored blackbird (*Agelaius tricolor*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: https://birdsna-org.bnaproxy.birds.cornell.edu/Species-Account/bna/species/tribla. Accessed December 15, 2017.

Meese, R. J. 2017. Results of the 2017 Tricolored Blackbird Statewide Survey. California Department of Fish and Wildlife, Wildlife Branch, Nongame Wildlife Program Report 2017-04, Sacramento, CA. 27 pp. + appendices.

Monson, G. 1960. The nesting season. Southwest Regional Report, Audubon Field Notes 14:469.

Orians, G. H. 1961. The ecology of blackbird (*Agelaius*) social systems. Ecological Monographs 31(3): 285–312.

Pierson, E.D., W.E. Rainey, and C. Corben. 2006. Distribution and status of Western red bats (*Lasiurus blossevillii*) in California. Calif. Dept. Fish and Game, Habitat Conservation Planning Branch, Species Conservation and Recovery Program Report 2006-04, Sacramento, CA 45 pp

Steidl, R. J., K. D. Kozie, G. J. Dodge, T. Pehovski, and E. R. Hogan. 1993. Effects of human activity on breeding behavior of golden eagles in Wrangell-St. Elias National Park and Preserve; a preliminary assessment. Copper Center, AK: National Park Service, Wrangell-St. Elias National Park Preserve.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in the Central Valley of California. Swainson's Hawk Technical Advisory Committee. May 31, 2000.

Swolgaard, C. A., K. A. Reeves, and D. A. Bell. 2008. Foraging by Swainson's hawks in a vineyard-dominated landscape. Journal of Raptor Research 42(3): 188-196.

DocuSign Envelope ID: 8814B58A-F4E7-48EB-85C5-0989B914FF65

Thomson, R. C., A. N. Wright, and H. B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. California Department of Fish and Wildlife and University of California Press: 84–92.

University of California, Davis (UC Davis). 2020. Tricolored blackbird portal. https://tricolor.ice.ucdavis.edu/. Accessed October 27, 2020.

United States Fish and Wildlife Service (USFWS). 2001. Least Bell's Vireo Survey Guidelines. January 2001. 3 pp.

USFWS. 2005. Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog. March 2005. 26 pp.

USFWS. 2006. Least Bell's vireo 5-year review: summary and evaluation. USFWS, Carlsbad, CA, USA.

USFWS. 2011. Standard Recommendations for the Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance. United States Fish and Wildlife Service. January 2011.

Weintraub, K., T. L. George, and S. J. Dinsmore. 2016. Nest survival of tricolored blackbirds in California's Central Valley. The Condor 118(4): 850–861.

Williams, D. F. 1986. Mammalian Species of Special Concern in California. California Department of Fish and Game. Wildlife Management Division Administrative Report 86-1 (June 1986): 66-69.

Williams, P. H., R. W. Thorp, L. L. Richardson, and S .R. Colla. 2014. Bumble bees of North America: An Identification guide. Princeton University Press, Princeton, New Jersey. 208pp.

Xerces Society for Invertebrate Conservation, Defenders of Wildlife, and Center for Food Safety. 2018. A petition to the State of California Fish and Game Commission to list the Crotch bumble bee (*Bombus crotchii*), Franklin's bumble bee (*Bombus franklini*), Suckley cuckoo bumble bee (*Bombus suckleyi*), and western bumble bee (*Bombus occidentalis occidentalis*) as Endangered under the California Endangered Species Act. October 2018.

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Attachment 1

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
RECOMMENDED MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)

PROJECT: McKay Point Reservoir Project

RECOMMENDED MITIGATION MEASURES	STATUS/DATE/INITIALS
Before Project Implementation	
Recommended Mitigation Measure 1: SJKF Habitat Assessment	
Recommended Mitigation Measure 2: SJKF Surveys and Avoidance	
Recommended Mitigation Measure 3: SJKF Take Authorization	
Recommended Mitigation Measure 4: Focused SWHA Surveys	
Recommended Mitigation Measure 6: SWHA Take Authorization	
Recommended Mitigation Measure 7: SWHA Tree Replacement	
Recommended Mitigation Measure 8: LBV Habitat Assessment	
Recommended Mitigation Measure 10: LBV Surveys	
Recommended Mitigation Measure 11: LBV Take Authorization	
Recommended Mitigation Measure 12: TRBL Surveys	
Recommended Mitigation Measure 14: TRBL Take Authorization	
Recommended Mitigation Measure 15: Focused Surveys for Nesting Eagles	
Recommended Mitigation Measure 17: BUOW Habitat Assessment and Surveys	
Recommended Mitigation Measure 19: BUOW Passive Relocation and Mitigation	
Recommended Mitigation Measure 20: FYLF Surveys	
Recommended Mitigation Measure 22: FYLF Take Authorization	
Recommended Mitigation Measure 23: CBB Surveys	
Recommended Mitigation Measure 25: Bat Roost Habitat Assessment	
Recommended Mitigation Measure 26: Bat Surveys	

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RECOMMENDED MITIGATION MEASURES	**STATUS/DATE/INITIALS**
Recommended Mitigation Measure 28: WPT Surveys	
Recommended Mitigation Measure 30: Special-Status Plant Surveys	
Recommended Mitigation Measure 32: Special-Status Plant Take Authorization	
Recommended Mitigation Measure 33: Special-Status Species Habitat Assessment	
Recommended Mitigation Measure 34: Special-Status Species Surveys	
Recommended Mitigation Measure 36: Stream and Wetland Mapping	
Recommended Mitigation Measure 37: Stream and Wetland Habitat Mitigation	
During Project Implementation	
Recommended Mitigation Measure 2: SJKF Surveys and Avoidance	
Recommended Mitigation Measure 5: SWHA Nest Avoidance	
Recommended Mitigation Measure 9: LBV Avoidance	
Recommended Mitigation Measure 13: TRBL Colony Avoidance	
Recommended Mitigation Measure 16: Nesting Eagle Avoidance	
Recommended Mitigation Measure 18: BUOW Avoidance	
Recommended Mitigation Measure 21: FYLF Avoidance	
Recommended Mitigation Measure 24: CBB Take Avoidance	
Recommended Mitigation Measure 27: Bat Roost Disturbance Minimization and Avoidance	
Recommended Mitigation Measure 29: WPT Avoidance and Minimization	
Recommended Mitigation Measure 31: Special-Status Plant Avoidance	
Recommended Mitigation Measure 35: Species Avoidance or Minimization	

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December 1, 2020

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Via E-Mail: mrohr@sespe.com

Tulare Irrigation District
Attn: Aaron Fakuda
6826 Avenue 240
Tulare, CA 93274
Via E-Mail: akf@tulareid.org

RE: Tulare Irrigation District Process and NOP

Dear Ms. Rohr and Mr. Fakuda:

As Legal Counsel and on behalf of our client Santa Fe Aggregates, Inc. ("SFA") and Waterford Properties, LLC. both wholly owned subsidiaries of Teichert, Inc., it recently came to our attention that scoping meetings were held, and a Notice of Preparation had been circulated for Tulare Irrigation District's McKay Point Reservoir Project. As Tulare Irrigation District ("TID") is aware, our client SFA is extremely disappointed with the way that TID handled its California Environmental Quality Act ("CEQA") obligations for the McKay Point Reservoir project (the "Project") to this point. To begin, TID failed to send the notice of preparation ("NOP"), which means that SFA was unable to provide meaningful comment on the scope of the environmental impact report ("EIR"). TID also failed to provide copies of all CEQA and other notices related to the Project, further impacting SFA's ability to meaningfully participate in the Project's CEQA process as a member of the public. SFA's interest in this project is well known by TID. SFA has been in regular contact with TID over the past year, so the failure to notify them of the meetings or NOP is unacceptable. Waterford Properties LLC, an adjacent landowner and sister company to SFA was also not provided notice.

Once made aware of the NOP by an outside party, SFA obtained a copy of the NOP from TID's website. In their abbreviated review of the NOP several issues were found that we expect to be carefully considered and reviewed by TID.

The NOP notes that TID had contracted with West Coast Sand and Gravel ("WCSG") to perform excavation for the Project. There is no mention of any competitive bidding or proposal process.

As a special district, TID is required to follow California law when contracting for public works and/or the use of TID owned land for mining purposes. California's Public Contract Code and Public Resources Code both have competitive bidding/proposal requirements applicable to TID for such contracting. The purpose for these competitive bidding/proposal requirements is to protect the public's finances and prevent TID officials from engaging in favoritism. The consequences for failing to follow these required procedures are severe. To be clear, TID's failure to comply with California law means any contract or arrangement between TID and WCSG for the Project is void and unenforceable under California law.

To demonstrate, below are the requirements governing TID's contract with WCSG that are found in the Public Contract Code and Public Resources Code. Keep in mind, TID has complied with neither.

The Public Contract Code Requires Competitive Bidding for the Project

TID has the express power to construct the necessary works, which includes a reservoir. (Water Code §§ 20530, 22226). The Public Contract Code requires TID to follow competitive bidding procedures for the construction of any works paid for with the proceeds of the sale of bonds or a limited assessment. (Public Contract Code § 20560 et seq.)

Alternatively, if, as previously reported in 2014, TID intends to finance the Project using royalties shared between TID and WCSG for processing the excavated materials at the adjacent Seaborn facility, the outcome does not change. Any arrangement between TID and WCSG to process excavated materials can only occur as the result of a publicly noticed competitive proposal process found in the Public Resources Code.

The Project's October 2, 2020, Notice of Preparation and Scoping Meeting(s) Notice (the "NOP") describes the Project as the development of "approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir . . . located on the north side of the divergence of the Lower Kaweah River and St. Johns River." (NOP, page 2, Project Summary). This description clearly establishes that the Project is a "works" as defined by the Water Code. (Water Code § 20530).

The NOP indicates that TID intends to "contract with West Coast Sand and Gravel ("WCSG") to excavate the site to allow for the construction of the reservoir." (NOP, page 2, Project Summary). There was no mention of any competitive bid

process. Failure to conduct competitive bidding prior to contracting with WCSG means that any existing agreement with WCSG is void and unenforceable.

The Public Resources Code Requires Competitive Proposals for the Project

TID may enter into operating agreements, leasing agreements, and all other types of agreements related to the mining of minerals on its lands if, in its judgment, doing such will not substantially interfere with the public use of the lands. (Water Code § 22501, Public Resources Code § 7051).

However, prior to such agreements, TID must follow the procedures set forth in the Public Resources Code, which include requesting competitive proposals and require TID to award such agreement to the highest bidder in a public session. (Public Resources Code § 7053). To ensure the public has adequate notice of TID's intended mineral mining arrangement, TID must, before the date of such meeting, publish certain information once a week for three successive weeks in one or more newspapers of general circulation in the county where the property is situated. (Public Resources Code § 7052).

Aside from TID's November 15, 2017, correspondence thanking SFA for the time and effort in preparing and submitting an expression of interest in the Project, TID provided no notice for any resolution inviting proposals, no public notification posted, no public meeting posting or advertisement, no newspaper publication notifying the public of TID's intended arrangement, or any information related to the mining of minerals on TID's land as set forth in the NOP for the Project.

Put simply, TID quietly negotiated WCSG's use of public land for profit without public input, or compliance with California law. Not only has TID attempted to dispose of the public's property (royalties from processing Project site minerals) by circumventing the required public procedure but doing so exposes the public to additional risk resulting from the void and unenforceable contract with WCSG.

Permitting Process

SFA is the current operator, permit holder, and lessee on the Seaborn property. As such they have detailed knowledge of the Seaborn site, permits, and reclamation plan. The NOP states that the "mining and processing" activities at Seaborn are not part of the project. However, the existing mining permits issued for the Seaborn site are for the parcels noted on each permit. A permit was never granted, and environmental analysis has not been completed that provides for a permanent processing plant on the site to be used with material mined from other properties. The Seaborn site is almost out of reserves and is set to close and be reclaimed to open space in compliance with the SMARA. Continued use of the site for processing and selling aggregate must be studied as a new project.

A comprehensive EIR was completed for SFA's nearby Kaweah South site, which is a mining, aggregate distribution, and reservoir project very similar in scope to McKay Point. The analysis in that document was completed on the premise that the Kaweah North (Seaborn) site was closing. A slight overlap of approximately 5 years was anticipated. SFA is on track with this anticipated closing and final reclamation of Seaborn now that the Kaweah South site is open. The EIR for the Kaweah South site therefore utilized the baseline impacts of Seaborn in its analysis. These baselines cannot be utilized again for the McKay Point project.

Since mining and processing would cease and the Seaborn site would be reclaimed to open space without the McKay Point project, the EIR for McKay point needs to study all impacts associated with the processing and sale of aggregate material from the Seaborn site.

The NOP states that overburden and excess fines from McKay will be stored on the Seaborn site. This comingles the two sites and would change the approved reclamation of the Seaborn site, thus requiring a new reclamation plan be developed and approved for the entire Seaborn site. The NOP also states that pumped water from the McKay site would be stored and recirculated at the Seaborn site. Again, this comingles the two sites and the impacts on the Seaborn site of these actions would need to be studied.

CEQA Analysis

The California Environmental Quality Act (CEQA) is California's broadest environmental law. CEQA helps to guide all Agencies during the issuance of permits and approval of projects. Courts have interpreted CEQA to afford the fullest protection of the environment within the reasonable scope of the statutes. CEQA applies to all discretionary projects proposed to be conducted or approved by a California public agency requiring discretionary government approval. The purpose of CEQA is to disclose to the public the significant environmental effects of a proposed discretionary project, through the preparation of an Environmental Impact Report (EIR) as well as prevent or minimize damage to the environment through development of project alternatives, mitigation measures, and mitigation monitoring and disclose to the public the agency decision making process utilized to approve discretionary projects through findings, including public participation in the environmental review process through scoping meetings, public notice, public review, hearings, and the judicial process. Environmental impact reports (EIRs) shall be used to provide full public disclosure of the environmental impacts of a proposed project. EIRs shall include identification of all significant effects, alternatives, and potential mitigation measures.

Failure to comply with CEQA to provide full disclosure of information during the CEQA process, which would result in relevant information not being presented to

the public agency, would constitute prejudicial abuse of discretion leaving the project proponent open to possible lawsuits.

As noted above, we were not provided the opportunity to comment on the NOP. Had we had the opportunity we would have noted that CEQA requires that environmental considerations not be separated or concealed by focusing on isolated parts of a project, to avoid overlooking the effect of the whole project in its entirety. As has been a precedent within the County and by TID specifically, a review of the "whole" of a project and a full and adequate CEQA document must be required to avoid unexpected delays or challenges to the Project. As noted in the NOP, TID acknowledges that each separate part of the McKay Reservoir Project is a foreseeable consequence of the other, which requires accurate view of the Project as a "whole". This Project may not be divided into smaller individual subprojects to avoid considering the environmental impact of the Project as a whole. Given such, we expect that TID will adequately analyze issues that include, but are not limited to, the following:

- Consistency with Plans and Programs including identified existing permits;
- Compliance with appropriate guidance regarding geographic scope of biological analysis;
- The sufficiency and scope of technical studies supporting the Project's EIR, such as a health risk assessment for toxic air contaminants; traffic impacts; water quality impacts;
- Whether sufficient water supplies are available for the Project;
- Whether other proposed projects must be considered probable future projects for purposes of a cumulative impact analysis;
- The characteristics of the Project's multiple phases;
- That the Project is consistent with the approved plans and specifications;
- Obtaining required agency approval of appropriate permits for the Project; and
- Identification of responsible agencies with authority over the Project and parties with interest in the Project.

CONCLUSION

As you can see, the conduct of TID in the matter of the WCSG contract, if not corrected, will result in financial harm to the public. It also creates a risk of damaging public trust if illegal contracts are issued on a Project with significant

public interest. We ask that TID carefully consider the information set forth in this letter. TID acted beyond the scope of its power under California law when contracting with WCSG. However, TID can remedy these contracting issues by conducting a fair and comprehensive publicly noticed bid or proposal procedure for the work contemplated by the WCSG contract, as is required by law. We expect that the other concerns noted in the letter will be addressed in any future environmental documents put forward for the Project.

If you should have any questions, please feel free to contact me directly at (209) 601-3915.

We look forward to and welcome the opportunity to participate in the Project. We again request SFA to be included as an Interested Party and be provided with all Notices and Documents related or considered as part of the "whole" of the project as soon as they become available.

Very truly yours,



ROD A. ATTEBERY
Attorney at Law

cc: Dana Davis, President Teichert Materials ddavis@teichert.com
Doug Reynolds, Santa Fe Aggregates, Inc. dreynolds@teichert.com

RAA/rlo

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Visalia, CA 93277

City of Visalia
Natural Resource Conservation Division
315 E. Acequia Avenue
Visalia, CA 93291

City of Exeter
Planning Department
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Exeter, CA 93221

State Clearinghouse
Attn: Environmental Review
1400 10th Street
Sacramento, CA 95814

Caltrans
District 6
P.O. Box 12616
Fresno, CA 93778

Air Resources Control Board
Attn: Environmental Review
P.O. Box 2815
Sacramento, CA 95812

Department of Conservation
Attn: Environmental Review
801 “K” Street, MS 24-01
Sacramento, CA 95814

California Dept. of Water Resources
Attn: Environmental Review
P.O. Box 942836
Sacramento, CA 94236

California Water Service Company
216 N. Valley Oaks Drive
Visalia, CA 93292

Southern California Edison
Attn: Environmental Review
2425 S. Blackstone Street
Tulare, CA 93274

Kaweah Delta Water Conservation Dist.
2975 Farmersville Road
Farmersville, CA 93223

City of Woodlake
Planning Department
350 N. Valencia Avenue
Woodlake, CA 93286

U.S. Army Corp of Engineers (USACE)
Sacramento District
Attn: Environmental Review
1325 “J” Street, Room 1513
Sacramento, CA 95814

California RWQCB
Region 5 - Central Valley
Attn: Environmental Review
1685 "E" Street
Fresno, CA 93706

California Depart. of Fish & Wildlife
Central Region (4)
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1234 E. Shaw Avenue
Fresno, CA 93710

San Joaquin Valley AQMD
Southern Region
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34946 Flyover Court
Bakersfield, CA 93308

Department of Conservation
California Geological Survey
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California Energy Commission
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Sacramento, CA 95814

Department of Conservation
State Mining and Geology Board
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State Water Resources Control Board
Division of Water Quality
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Sacramento, CA 95812

CA Native American Heritage Comm.
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691

California Highway Patrol
Central Division
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California Dept. of Parks & Recreation
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Central Valley Flood Protection Board
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3310 El Camino Avenue, Suite 170
Sacramento, CA 95821

Southern California Edison
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West Palm Beach, FL 33406

Rocky Hill Inc.
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Exeter, CA 93221

Rodney Jr. & Jannelle Anne Engel
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Mesa, AZ 85275

David A. Cairns
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Cairns Ranch Co.
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Borghild Corp.
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San Francisco, CA 94117

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

NOTICE OF PREPARATION AND SCOPING MEETING(S) NOTICE

FROM: Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

TO: Interested Agencies, Organizations, and Individuals

DATE: October 2, 2020

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

The Tulare Irrigation District (TID), as the Lead Agency under the California Environmental Quality Act (CEQA), will be coordinating the preparation of an Environmental Impact Report (EIR) for the proposed McKay Point Reservoir Project. The Proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. TID is requesting identification of environmental issues and information that you or your organization believes should be considered in the EIR.

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake. The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the Project area are mining, agricultural, and residential. The adjacent lands to the north, northeast, southwest and west are currently being used for aggregate

mining operations, and the areas south and east of the Project site are used intensively for agricultural and, to a limited extent, for rural residential purposes.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the Proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. TID is the Project Applicant on behalf of the Owners and is the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating water released for the Owners during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah).
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Constructing the reservoir in such a way that revenue can be obtained to offset the construction and development costs.

- Locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet.
- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.
- Provide additional storage capacity for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Contract with WCSG to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset the construction and development costs.

Potential Environmental Effects: An EIR will be prepared to evaluate the Proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

Public Review Period: October 2, 2020 and ends on November 2, 2020.

Responses and Comments: Please send your responses and comments by November 2, 2020 to the following address or email:

Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110
Phone: (805) 275-1515
Email: mrohr@sespe.com

Scoping Meeting: TID will hold two scoping meetings for the Proposed Project to receive comments on the scope and content of the EIR. In accordance with the Governor's Executive Order (N-29-20) and the declared State of Emergency, including social distancing directives as a result of the COVID-19 virus, these Scoping Meetings will be held remotely. There will not be a physical location for these meetings. Members of the public may participate in the Scoping Meetings remotely via the scheduled dates, times, and following options. The scoping meeting is scheduled as follows:

Scoping Meeting 1

Date:	October 15, 2020
Time:	5:30 p.m. – 8:30 p.m.
Place:	Online (WebEx)
WebEx Link:	https://bit.ly/343WV9a
Meeting Number:	126 477 3382
Meeting Password:	McKay (62529 for phone systems)
Video Link:	1264773382@webex.com
Video Number:	173.243.2.68 (enter meeting number)
Phone Number:	+1-415-655-0001 (enter meeting number)
Access Code:	126 477 3382

Scoping Meeting 2

Date:	October 16, 2020
Time:	9:00 a.m. – 12:00 p.m.
Place:	Online (WebEx)
WebEx Link:	https://bit.ly/3kUUUmr
Meeting Number:	126 662 8580
Meeting Password:	McKay (62529 for phone systems)
Video Link:	1266628580@webex.com
Video Number:	173.243.2.68 (enter meeting number)
Phone Number:	+1-415-655-0001 (enter meeting number)
Access Code:	126 662 8580

Agencies: In accordance with California Code Regulations, Title 14, Section 15082 (b), the TID requests your agency's view on the scope and content of the environmental information relevant to your agency's statutory responsibilities in connection with the Proposed Project. Your agency may need to use the EIR prepared by the TID when considering any permits that your agency must issue, or other approvals for the Proposed Project.

If you have additional information please contact Maya Rohr, Project Manager, at (805) 275-1515 or via email at mrohr@sespe.com.

Document Availability: This Notice of Preparation and a detailed Project Description can be viewed on the TID website at: https://tulareid.org/engineering-capital-projects. The notice is also posted in the outside noticing box located in front of the Tulare Irrigation District office at the following address: 6826 Avenue 240 – Tulare, CA 93274.

If you have additional information please contact Maya Rohr, Project Manager, at (805) 275-1515 or via email at mrohr@sespe.com.



McKay Point Reservoir

Affordable new storage

Flood control

Clean energy



AGENDA

- Introductions - TID
- CEQA Process – Sespe, Inc.
- Proposed Project- TID
- Public Scoping Comments
- Meeting Format
  - Session will be **RECORDED**
  - Public Scoping Comments
    - 2-3 minutes per speaker
    - Moderator will cue speakers

The Purpose of this Public Scoping Meeting

- The California Environmental Quality Act (CEQA) requires analysis and public disclosure of environmental impacts associated with proposed projects.
- Public involvement is an integral part of the environmental analysis.
- This Scoping Meeting is to provide the public with information on the proposed McKay Point Reservoir.
- Public comments will be considered and addressed as appropriate in the Draft EIR.



Future McKay Point Reservoir

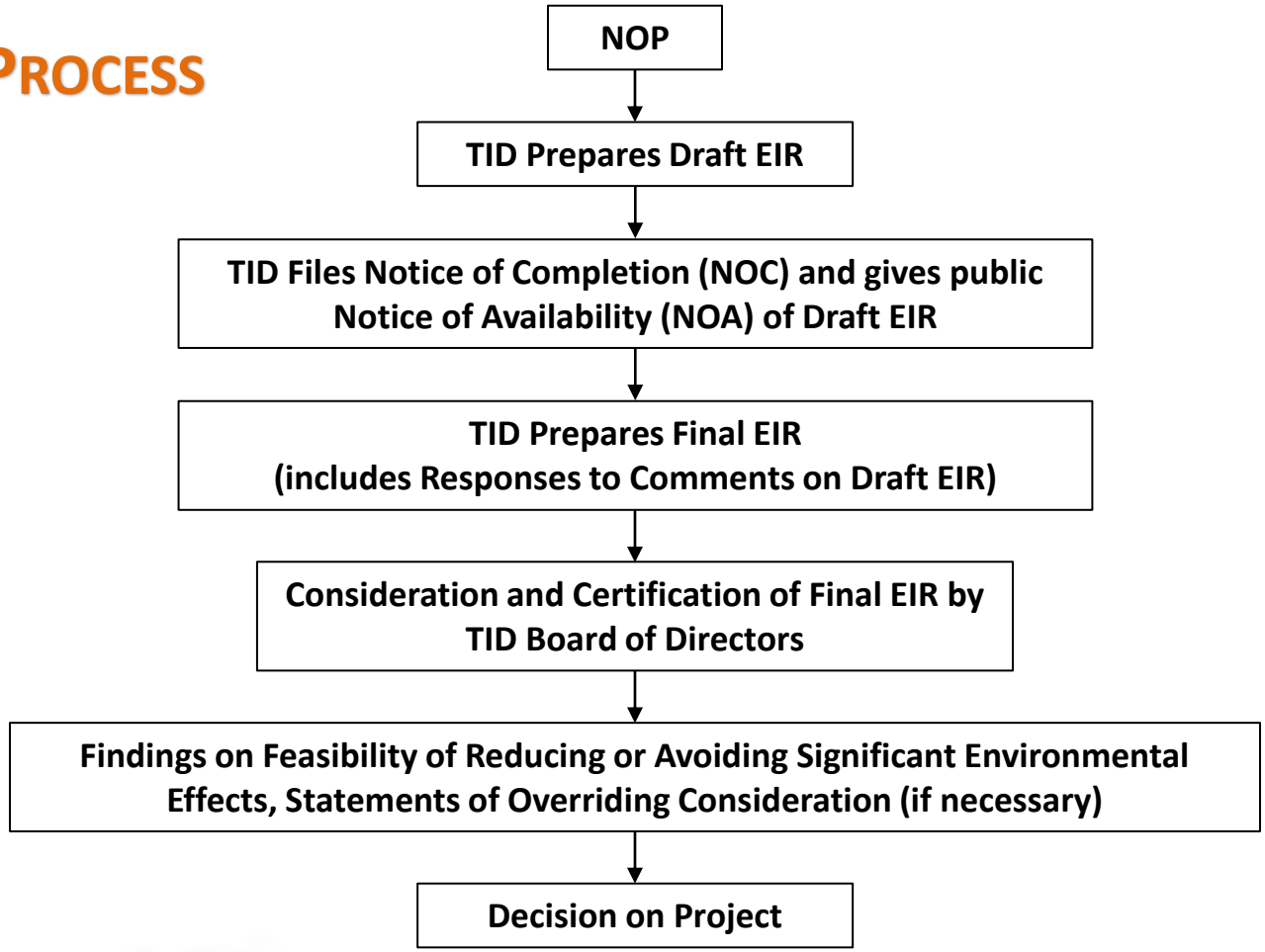
The EIR Process

- A proposed Project requires a discretionary decision/approval.
- Identify the Lead Agency – Tulare Irrigation District (TID).
- Public scoping process.
- Draft Environmental Impact Report (EIR).
- Public review of the Draft EIR.
- Lead Agency addresses public comments in a Final EIR.
- Lead Agency determination/approval.





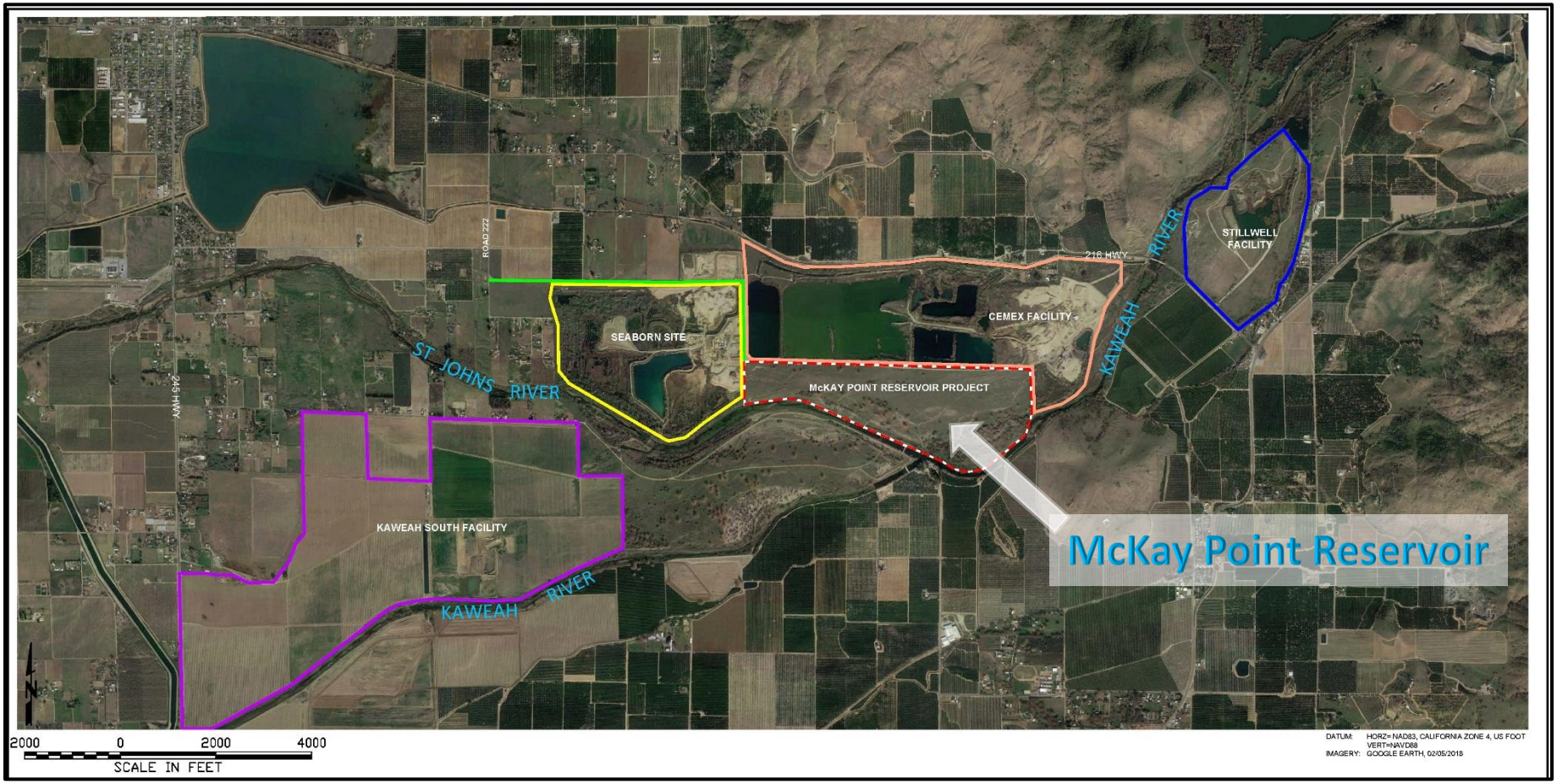
THE EIR PROCESS



Project Highlights

- Create new water storage.
- Provide flood control.
- Allow for more efficient water distribution to agriculture.
- Allow for the generation of electricity when it is most needed.
- Employ the latest technologies to minimize groundwater impacts.

McKay Point Property Location



LEGEND

- PROJECT SITE BOUNDARY
- SEABORN SITE
- ACCESS ROAD
- KAWEAH SOUTH FACILITY
- STILLWELL FACILITY
- CEMEX FACILITY

Innovative Approach

- Three phases of the Project:
  1. Excavation of site;
  2. Construction of reservoir and facilities; and
  3. Operation of reservoir.

- Excavation of the site will generate usable building material (aggregate) to support the infrastructure of our local communities.

- A local supply of building materials reduces air pollution related to transportation of building materials.

- The sale of the building materials will provide revenue to help pay for the construction of the reservoir.

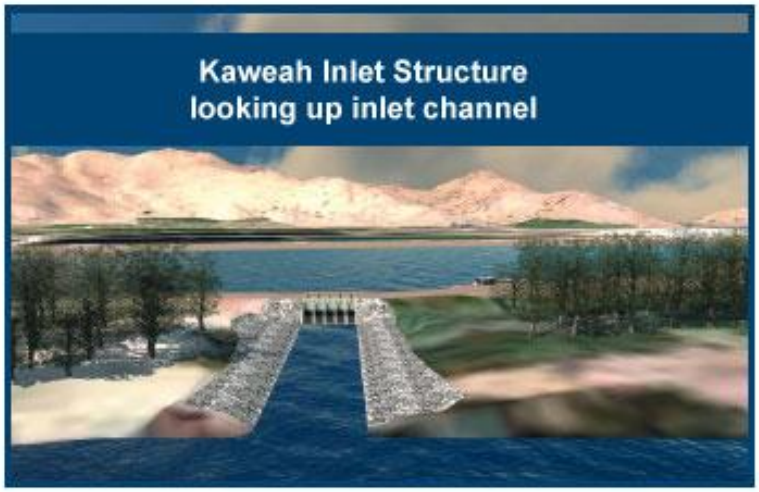


Phase 1 - Excavation

- TID partnered with West Coast Sand and Gravel (WCSG) to excavate the site in preparation for reservoir construction.
- The County of Tulare is the lead agency for compliance with California's Surface Mining and Reclamation (SMARA) Act.
- Excavation is expected to begin in 2022 and be completed in 2042 (based upon market demand for building materials).
- SMARA Reclamation Plan – end use is the reservoir.

Phase 2 – Reservoir Construction

- Barriers (slurry wall or equivalent) will be installed early to protect groundwater and neighboring wells.
- Reservoir is designed to minimize intrusion of groundwater to 500 gallons per minute.
- Depth of the reservoir would reach an impervious layer or bedrock – approximately 60 feet below ground surface.
- Reservoir construction is estimated to be completed in the 2040's (depending on market demand).



Phase 3 – Reservoir Operations



Kaweah Inlet Structure
looking southwest

- Off-stream storage of approximately 4,000 acre-feet.
- 500 cubic feet per second inlet capacity from Kaweah River.
- 160 cubic feet per second pumping capacity back to Lower Kaweah River.
- 900 cubic feet per second return capacity to St. Johns River.

Reservoir Benefits Summary

- New water storage.
- Improved water management to support agriculture.
- Enhanced flood control.
- Optimized energy generation during peak demand.
- Locally sourced building materials, which reduces emissions and costs.

Contact Us/Submit Comments

- The NOP established a formal 30-day public comment period through November 4, 2020.

- Please submit your comments to:

Maya Rohr
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110
(805) 275-1515
mrohr@sespe.com

Aaron Fukuda
Tulare Irrigation District
(559) 686-3425
akf@tulareid.org

APPENDIX A-2

Notice of Preparation with Project Description

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

NOTICE OF PREPARATION AND SCOPING MEETING(S) NOTICE

FROM: Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

TO: Interested Agencies, Organizations, and Individuals

DATE: October 2, 2020

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

The Tulare Irrigation District (TID), as the Lead Agency under the California Environmental Quality Act (CEQA), will be coordinating the preparation of an Environmental Impact Report (EIR) for the proposed McKay Point Reservoir Project. The Proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. TID is requesting identification of environmental issues and information that you or your organization believes should be considered in the EIR.

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the Project area are mining, agricultural, and residential. The adjacent lands to the north, northeast, southwest and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are used intensively for agricultural and, to a limited extent, for rural residential purposes.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the Proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. TID is the Project Applicant on behalf of the Owners and is the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating water released for the Owners during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah).
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
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A detailed Project Description is attached to this NOP.

Potential Environmental Effects: An EIR will be prepared to evaluate the Proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

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Meeting Password:	McKay (62529 for phone systems)
Video Link:	1264773382@webex.com
Video Number:	173.243.2.68 (enter meeting number)
Phone Number:	+1-415-655-0001 (enter meeting number)
Access Code:	126 477 3382

Scoping Meeting 2

Date:	October 16, 2020
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WebEx Link:	https://bit.ly/3kUUUmr
Meeting Number:	126 662 8580
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Video Link:	1266628580@webex.com
Video Number:	173.243.2.68 (enter meeting number)
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Access Code:	126 662 8580

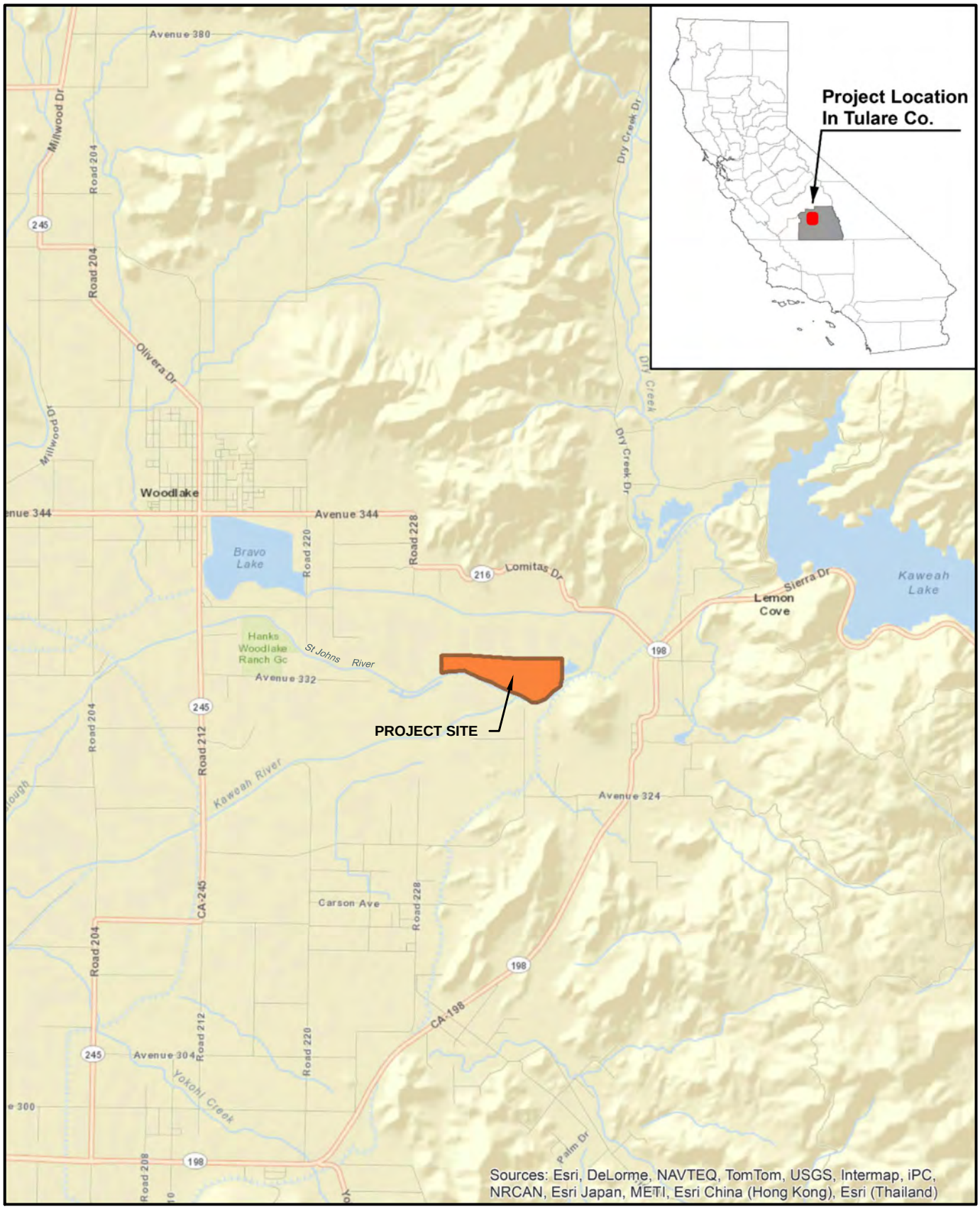
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FIGURES



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N.T.S.

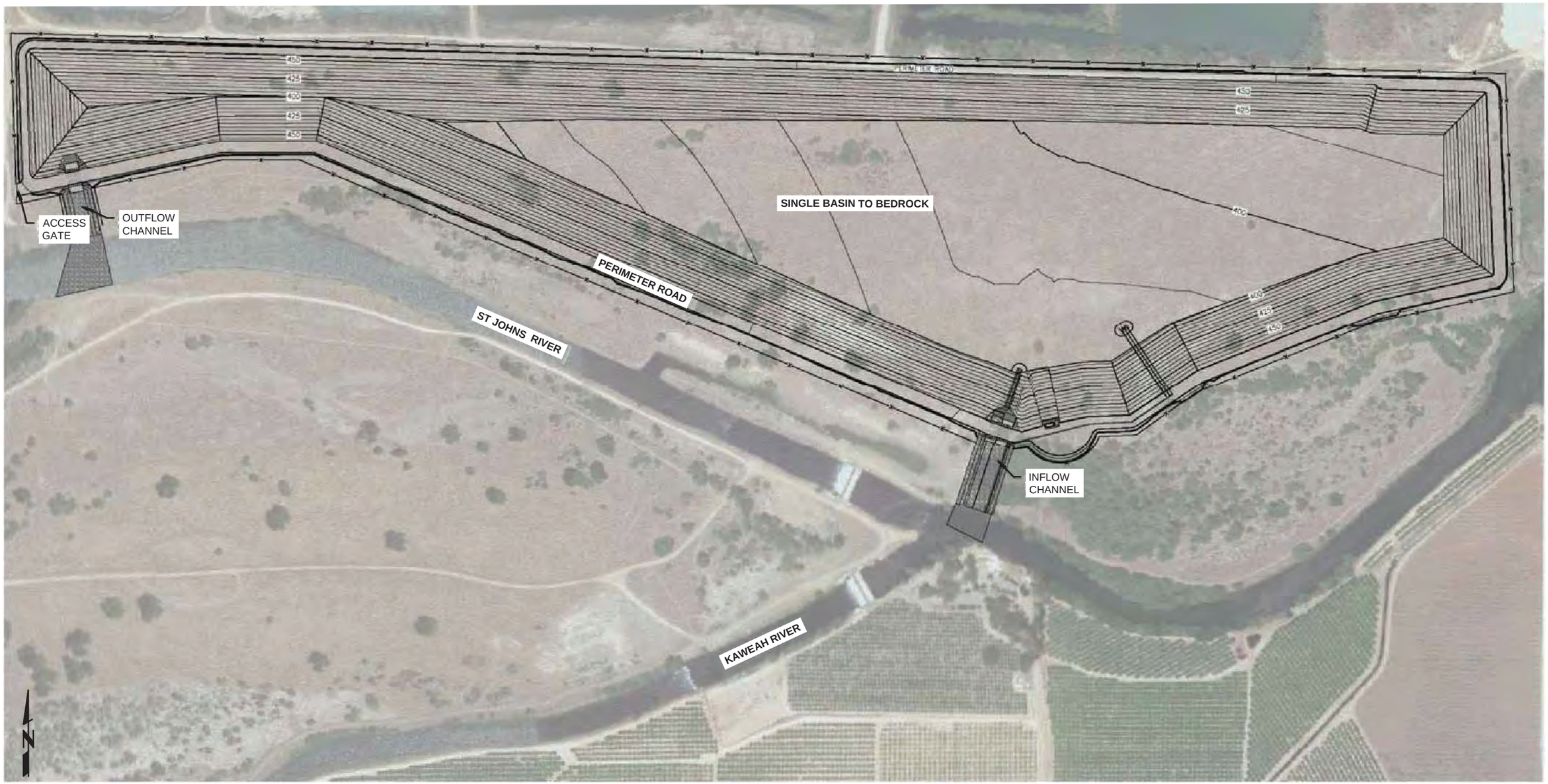
SOURCE MATERIAL FROM:
PROVOST & PRITCHARD
CONSULTING GROUP

SESPE
CONSULTING, INC.
374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

McKAY POINT RESERVOIR PROJECT SITELOCATION MAP

SCALE: HORIZ. AS SHOWN VERT. AS SHOWN
FIGURE NUMBER 1
DRAWN BY: G.CAMUS
CHECKED BY: GS
DATE: JULY 2020

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SCALE IN FEET

SOURCE MATERIAL FROM:
PROVOST & PRITCHARD
CONSULTING GROUP

SESPE CONSULTING, INC.
374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

McKAY POINT RESERVOIR
FINAL RESERVOIR
SITE PLAN

SCALE: HORIZ. AS SHOWN
VERT. AS SHOWN
DRAWN BY: G.CAMUS
CHECKED BY: GS
FIGURE NUMBER 2
DATE: JULY 2020

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PROJECT DESCRIPTION

1.0 PROJECT DESCRIPTION

1.1 Project Overview

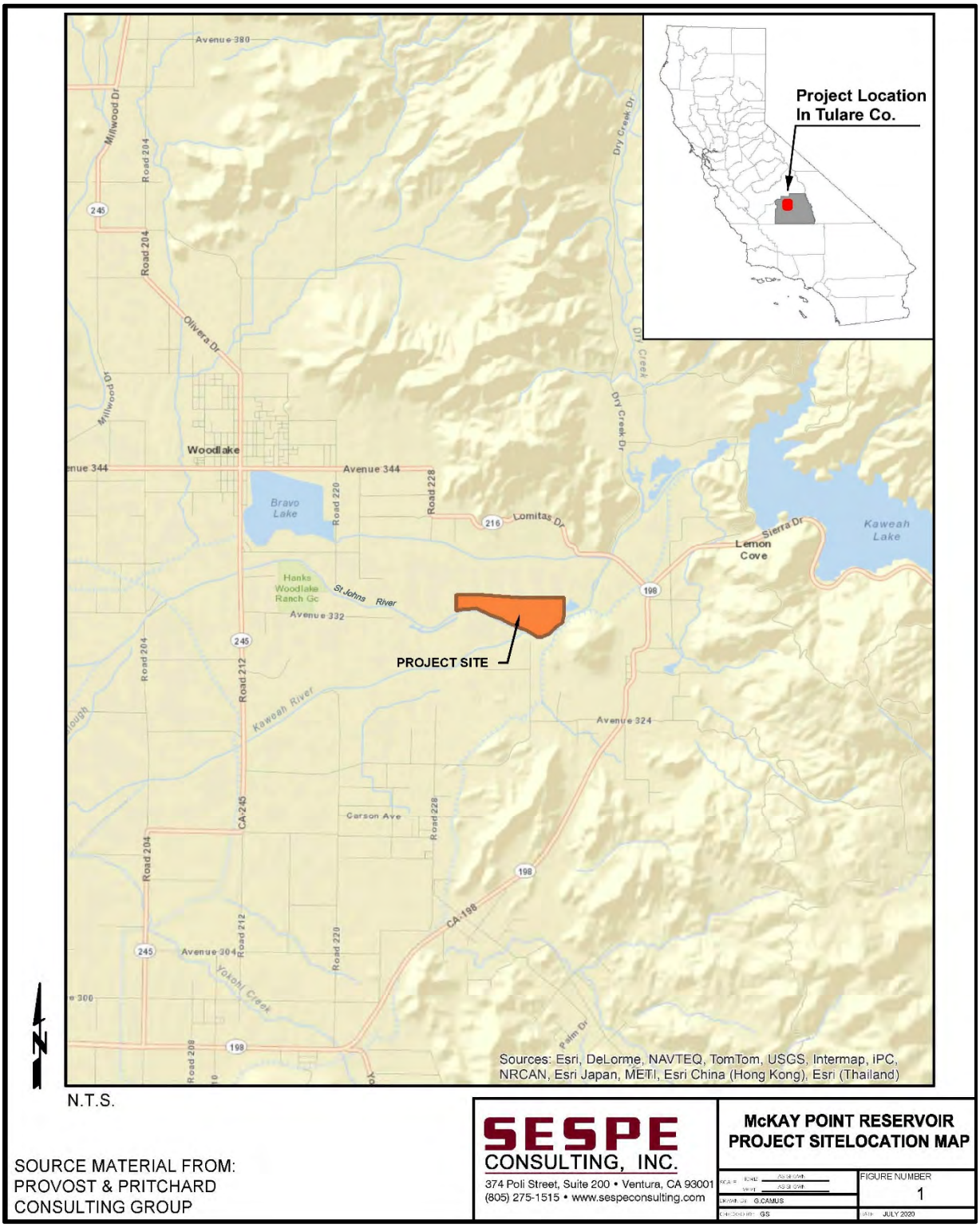
Tulare Irrigation Distract (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC) are the Owners of approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, referred to as the McKay Point property. Together, the Owners are the holders of pre-1914 and post-1919 appropriative water rights on the Kaweah and/or the St. Johns Rivers, and they own storage capacity rights in Lake Kaweah formed by the impoundment of water behind the Terminus Dam.

TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah and St. Johns River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code.

The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River. The surrounding land uses are mining, agricultural, and residential (Figure 1 – Project Site Location Map, Figure 2 – Project Site and Surrounding Land Use).

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and, operation of the reservoir. The Owners would contract with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage/re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

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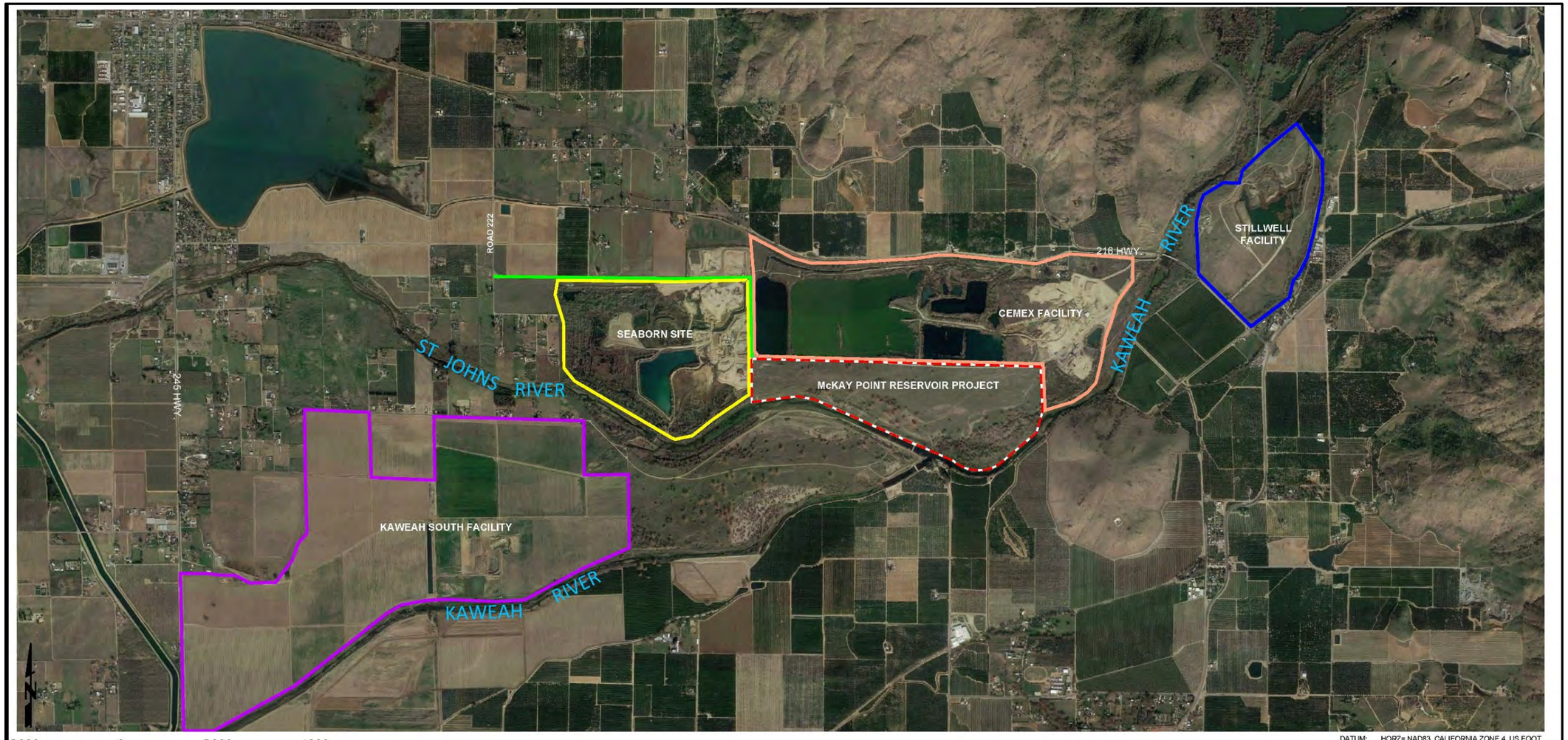
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CONSULTING GROUP

SESPE CONSULTING, INC.
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(805) 275-1515 • www.sespeconsulting.com

McKAY POINT RESERVOIR PROJECT SITELOCATION MAP

FIGURE NUMBER 1

DRAWN BY: G.CAMUS
CHECKED BY: GS
DATE: JULY 2020


ROAD 222
245 HWY
ST JOHNS RIVER
SEABORN SITE
216 HWY
CEMEX FACILITY
KAWEAH RIVER
STILLWELL FACILITY
McKAY POINT RESERVOIR PROJECT
KAWEAH SOUTH FACILITY
KAWEAH RIVER
N
2000 0 2000 4000
SCALE IN FEET
DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/05/2018
LEGEND
PROJECT SITE BOUNDARY
SEABORN SITE
ACCESS ROAD
KAWEAH SOUTH FACILITY
STILLWELL FACILITY
CEMEX FACILITY
SESPE CONSULTING, INC.
374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com
McKAY POINT RESERVOIR PROJECT SITE AND SURROUNDING LAND USE
FIGURE NUMBER 2
DRAWN BY: G CAMUS
CHECKED BY: GS
DATE: JULY 2020

1.2 Project Objectives

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating water released for the Owners during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah).
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
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- Contract with WCSG to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset the construction and development costs.

1.3 Environmental Setting

1.3.1 Regional Setting

The Project site is located near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Project site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek, before draining into the Tulare Lake bottom near Corcoran.

The *Foothill Growth Management Plan Element* of the *Tulare County General Plan* describes the area climate as typical of the foothill region, with cool rainy winters having a mean daily temperature ranging from 40° to 50° F and hot dry summers where daytime temperatures can exceed 100° F.

During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the foothills. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and ranges from approximately 10 inches at the base to 25 inches at 3,000 feet. Most of this precipitation occurs between November and April.

During daytime there is a dominant southeasterly wind flow pattern towards the Tehachapi Mountains. At night, this flow is reversed by winds that flow from the Sierra mountain and foothill canyons.

Biological resources in the region have been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley oak and interior live oak on higher ground. Herbaceous wetland bottoms and upland native grassland communities were common in this vegetation mosaic. The extensive oak forests and riparian/wetland habitats hosted a diverse and abundant wildlife community. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation.

Currently in the foothills, the vegetation ranges from annual grasses in open areas to dense shrubs and trees. Much of the native vegetation in the area has been replaced by introduced species or has been eliminated by cultivation and overgrazing. Agriculture is currently the main land use in the region, although narrow strips of riparian vegetation grow along remnant tributaries.

1.3.2 Project Site Setting

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 miles to the southwest of the Project site (Figure 2 – Project Site and Surrounding Land Use). These figures illustrate how adjacent lands to the north, northeast, southwest, and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes.

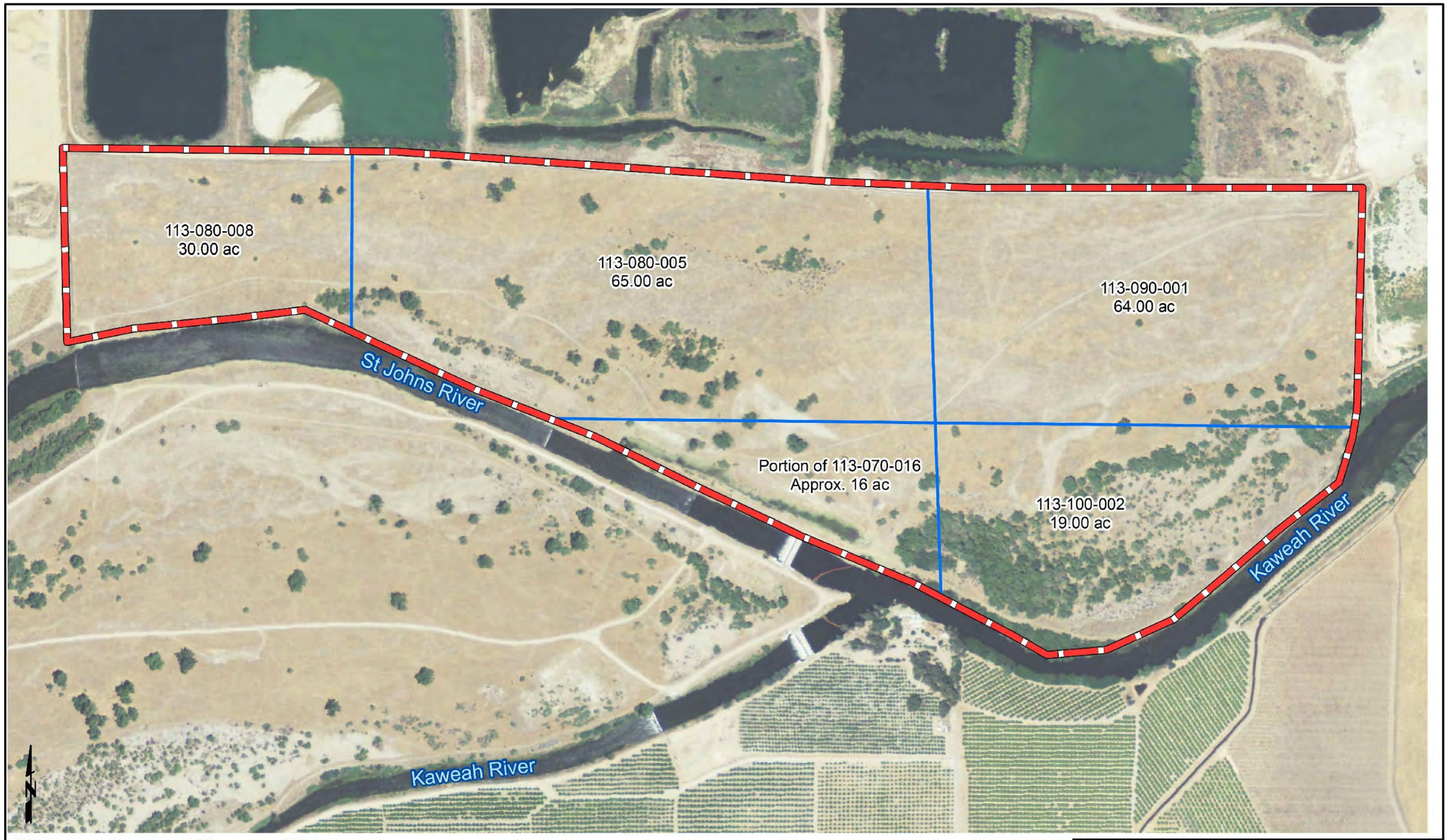
Most of the Project site is vegetated with non-native grasses except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs. The surface soil at the Project site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Grasses and trees are present and these increase in density with proximity to the nearby rivers. The Project site topography is relatively level with a depression in the southeast corner. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The Project site elevation decreases from approximately 472-feet above mean sea level (amsl) on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end.

The long-term water-level measurements for wells in the area indicate a stability of groundwater levels, except for temporary declines during drought periods. Test borings within the Project site indicate depth to groundwater ranges from 20- to 7-feet below ground surface (bgs), with corresponding groundwater level elevations ranging from 438- to 459-feet amsl.

Table 1 lists the Assessor's Parcels occupied by the Project site and provides the parcel size, Tulare County General Plan Designation, Zoning, and Mineral Resources designation for each assessor's parcel numbers (APN). Figure 3 – Project Parcels identifies where the parcels are located on the Project site.

Table 1 Assessor's Parcel Numbers, General Plan, Zoning and Mineral Resources

APN	APN Acres	Tulare County General Plan Land Use Designation	Zoning	Mineral Resources
113-070-016-000 (portion)	16.00	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area
113-080-005-000	65.00	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area
113-080-008-000	30.00	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area
113-090-001-000	64.00	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area
113-100-002-000	19.00	Rural Valley Lands Plan, Valley Agricultural	AE-20	Aggregate Resource Area



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McKAY POINT RESERVOIR PROJECT PARCELS

FIGURE NUMBER 3

DRAWN BY: G.CANUS
CHECKED BY: GB
DATE: JULY 2020

1.4 Regulatory Setting

TID is the Lead Agency for purposes of administering the requirements of the CEQA, and for preparing the Project EIR. TID is also the Project Applicant on behalf of the Owners. The County is a Responsible Agency under CEQA.

Because WCSG would process material taken from the Project site during excavation of the reservoir as a marketable product (construction grade aggregate), TID would be required to comply with the Surface Mining and Reclamation Act (SMARA) and obtain the County's approval of a Surface Mining Permit, Reclamation Plan, and Financial Assurance Cost Estimate. The Tulare County Code and Zoning Ordinance states that a Special Use Permit would not be required in addition to the surface mining permit.

1.5 Reservoir Operations

1.5.1 Overview

The Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, groundwater recharge supplies, and power enhancement via water re-regulation. As a result, the Project would provide multiple benefits, including:

- Flow re-regulation for better surface water utilization.
- New water yield for irrigation purposes by capturing damaging and unutilized floodwater and returning it to the rivers to be used by water users served by the Owners or other Association Units. This includes the ability to increase groundwater recharge efforts.
- Flood control by capturing and temporarily holding damaging floodwater at times when downstream interests, including the City of Visalia, may otherwise see damaging flood flows.
- Seasonal flow re-regulation for increased hydroelectric power generation and revenue production by extending the power generation season.
- Optimize the capture of water released during peak power enhancement flows from the Terminus Hydropower Plant (at Lake Kaweah) for later release when needed downstream.

1.5.1.1 McKay Point Check Structures

The existing McKay Point Check Structures include the water control facilities owned and operated by the Kaweah Delta Water Conservation District and the Kaweah and St. Johns Rivers Association. The structures consist of two check structures, one on the St. Johns River and one on the Lower Kaweah River, each with nine automated gates. The structures can be operated such that the gates on the St. Johns River side can be raised, therefore shunting more flows down the Lower Kaweah River. Because CPDC, VKWC, and TID hold many of the rights to the waters of the Kaweah River system, water released from the reservoir and shunted into the Lower Kaweah River in this manner would serve CPDC and VKWC customer needs, as well as TID customer needs if necessary.

In a similar manner, the McKay Point Check Structures can be operated such that the gates on the Kaweah River side can be raised, therefore shunting more flows down the St. Johns River. Because TID holds rights to waters of the St. Johns River, water released via the outflow channel would serve TID customer needs.

1.5.1.2 Inflow Channel Management

The inflow and outflow channels would be constructed perpendicular to the Lower Kaweah River and St. Johns River (Figure 4 – Final Reservoir Site Plan). The inflow channel would provide flow into the reservoir via a reinforced concrete control structure. The control structure would include an approach apron, reinforced concrete floor, a flow/level control gate, walls, and a deck on top of the structure. The bottom of the river channel and the banks of the inflow channel would be rip-rapped to prevent erosion.

To receive river water into the reservoir, the electrically operated weir on the inflow channel would be lowered. The water level in the Kaweah River can also be raised at the same time, by raising the gates at the McKay Point Check Structures. Water would flow by gravity into the reservoir up to a maximum flow rate of 500 cubic feet per second (cfs) via the inflow channel. Upon achieving water level equilibrium between reservoir and river, the electrically operated weir would be raised. As the level of the river recedes, either by the passing of the flood peak, or by lowering the gates on the McKay Point Check Structures, the electrically operated weir would serve to hold water in the reservoir.

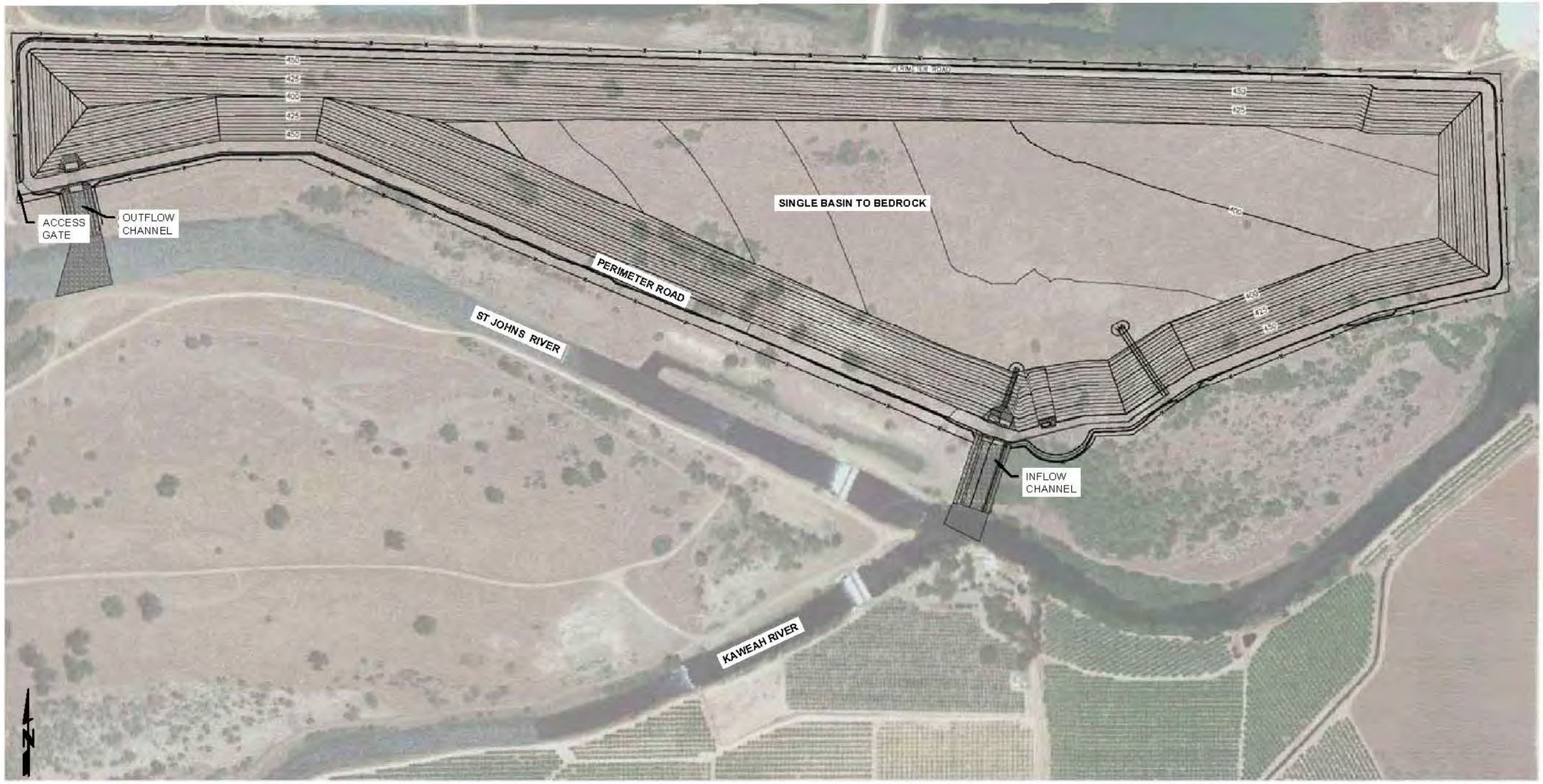
1.5.1.3 Outflow Channel Management

1.5.1.3.1 *Gravity-Flow Water Delivery into the St. Johns River and Kaweah River*

When the St. Johns River water level is lower than that of the reservoir, lowering the electrically operated weir on the outflow channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs. The average flow rate of return would approximate 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approaches the level of the outflow channel.

When the Kaweah River water level is lower than that of the reservoir, lowering the electrically operated weir on the inflow channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs. This would be done in concert with the raising of the St. Johns River control structure, since the inflow channel is upstream of the divergence of the St. Johns River from the Kaweah River. The average flow rate of return would approximate 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approached the level of the inflow channel.

The outflow channel would provide flow out of the reservoir via a reinforced concrete control structure. The control structure would include a reinforced concrete floor, flow/level control gate, walls, and a deck on top of the structure. The bottom of the river channel and the banks of the Outflow Channel would be rip-rapped to prevent erosion.



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McKAY POINT RESERVOIR
FINAL RESERVOIR
SITE PLAN

SCALE: HORIZ. AS SHOWN
VERT. AS SHOWN
DRAWN BY: G.CARLOS
CHECKED BY: GS
DATE: JULY 2020

FIGURE NUMBER
4

The inflow channel could also be used in reverse as an outflow facility to deliver releases to the Kaweah River. When the Kaweah River water level is lower than that of the reservoir, lowering the electrically operated weir on the inflow channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs. The average flow rate of return would be approximately 125 to 150 cfs because the flow rate would reduce gradually to zero as the level of the reservoir approached the level of the inflow channel

Water delivery in this manner is limited by the amount of water being stored at a level higher than that of the inflow channel (i.e., approximately 15-feet of additional storage). Once the level of the reservoir falls below that of the inflow channel, the floating barge pump and its related piping would be used as described below.

1.5.1.3.2 *Pumped Water Delivery into the St. Johns River or Lower Kaweah River*

To release water to the St. Johns River or the Lower Kaweah River when the river water levels are higher than that of the reservoir, and the reservoir is lower than the Inflow or outflow channels, the water would be pumped from the reservoir, via an electrical pump, and discharged into the Kaweah River, upstream of the McKay Point Check Structures. The pump, or series of pumps, would have an approximate maximum flow rate of 160 cfs. When this is done, the McKay Point Check Structures would be operated to direct flow into the St. Johns River or the Lower Kaweah River.

1.5.1.4 Supervisory Control and Data Acquisition

Supervisory Control and Data Acquisition (SCADA) equipment would be used to:

- Monitor Reservoir and river levels;
- Monitor and operate the inflow channel, outflow channel, and floating barge pump; and
- Monitor and coordinate with the automated gates of the McKay Point Check Structures with the Kaweah Delta Water Conservation District and the Kaweah and St. Johns River Association.

SCADA equipment would permit remote monitoring, control, and operations by TID operators from TID's offsite office. In addition, TID operators would have the ability to set the control gates in either a condition of flow control or level control. In flow or level control, the gates would autonomously operate to maintain a desired flow, or a desired elevation, respectively, in the river channels.

1.5.1.5 Flood Control/Storm Water Management During Operations

The Project's water turnout facilities would allow the diversion of up to 500 cfs. With 4,600 acre-feet of total capacity, the reservoir could go from empty to full in just 5 days. This relatively short time span coincides with most of the local peak rain/flood events. The local peak rain/flood events are also of relatively short duration, with much of the flood water coming from the uncontrolled Dry Creek, which enters Kaweah River midway between the Project site and the Terminus Dam Reservoir (a distance of approximately 1.1 miles upstream from the Project site). The ability to capture 500 cfs of floodwater is significant, considering that such a flow might otherwise impact the levees protecting the City of Visalia.

1.5.1.6 Distribution of Stored Water/Reduced Energy Use and Greenhouse Gases

Although there would be no hydroelectric power generation at the Project site, the Project would have the ability to re-regulate releases made from Lake Kaweah. This would allow the Terminus Hydropower Plant outlets to produce more peak period power and some ability to generate more energy overall. The Kaweah River Power Authority is engaged in the planning and design for another hydropower unit at Terminus Dam. Such an additional generator adds to the potential for the Project to be useful to optimize energy generation.

If requested, the Project would be able to increase the instantaneous flow rate through the Terminus Hydropower Plant hydroelectric generators in order to release more water than is needed by downstream interests. For example, during on-peak power generation periods from noon to 6:00 p.m., releases from Lake Kaweah can be increased, thereby enhancing the ability to meet peak power generation demands and the generation of additional revenues. Releases from Lake Kaweah would then be reduced during off-peak hours and make-up irrigation deliveries would be made out of captured water within the Project. The ability to re-regulate flows in an "after-bay" facility associated with, and downstream of, the Terminus Hydropower Plant could provide a constant and consistent flow to downstream interests. One of the benefits of the Project is that the reservoir would have the ability to provide such an “after-bay” function.

The Project also serves to extend the generation season by allowing the releases from Lake Kaweah through the hydroelectric generators to be made during a shorter period of time, but at higher flow rates. This would allow the hydroelectric generators to function when they would otherwise be shut off because they do not have enough flow through them to operate.

The Kaweah River Power Authority (an entity comprised of the Kaweah Delta Water Conservation District and TID) owns the hydroelectric generation facilities at Terminus Dam on Lake Kaweah. It is envisioned that agreements would be developed to compensate the Owners for the power generation and revenue enhancement created by the Project. Any additional kilowatt-hours of energy generated, including that during on-peak hours, would aid in reducing greenhouse gas emissions from alternative traditional power sources.

1.5.1.7 Re-regulation for More Efficient Water Utilization

When flood control releases are required from Lake Kaweah, or when Dry Creek or Yokohl Creek are running, water must be diverted to groundwater recharge basins or otherwise disposed. This is because there is reduced irrigation demand from the Owners' water users during periods of heavy rainfall. The Project would allow flood releases to be diverted and stored temporarily until the demand for irrigation water resumes or groundwater recharge facilities located downstream have capacity to receive more surface water. When diverted and stored, such water would be sold/delivered directly to irrigation users, thereby saving the significant amount of energy otherwise consumed through groundwater recharge and subsequent recovery.

1.5.1.8 New Yield

The Project would have the ability to capture some of this floodwater, and it would be held in the reservoir until it can be safely returned to the Lower Kaweah River and St. Johns River for direct use or recharge. The reservoir could fill and empty multiple times during wet years when there is sufficient dry time to safely,

effectively and beneficially return the water to the Lower Kaweah River and St. Johns River. Through this floodwater recapture it is estimated the Project could provide approximately 4,600 acre-feet per year of new yield.

1.5.1.9 Water Management within the Excavation/Completed Reservoir

During long-term operations as a water management facility, it is intended that the reservoir remain relatively empty and void of local groundwater in order to provide maximum space to receive Kaweah River water as directed by the Owners. A slurry wall installed around the reservoir, is intended to minimize the groundwater inflows to approximately 500 gallons per minute (gpm). This would serve to keep the reservoir in a near dry condition when not being used for storage. If needed, de-watering would be conducted to maintain dry conditions. Seepage into the excavation would be captured at a designated location within the reservoir, and would then promptly be placed back into the aquifer via an infiltration gallery consisting of onsite ditches that could be covered with granular materials to minimize evaporation.

1.5.1.10 Operational Control

During Project operations and management, the Owners would have daily control over the reservoir and related facilities, which include the use of the SCADA equipment to monitor and control the facility remotely. TID staff would also perform routine onsite inspections to ensure the reservoir is operating properly.

1.5.1.11 Traffic During Operations

The routine operation of the Project would be conducted from TID's offsite office; therefore, the number of employees routinely driving to the site would be minimal. Operation and maintenance of the Project would generate only nominal traffic primarily associated with maintenance operations.

1.5.1.12 Mobile Equipment Used During Operations

During the operations and maintenance of the reservoir, there would be limited equipment usage, but equipment could be needed to perform minor grading of the access road and to remove any debris that collects in the bottom of the reservoir. The following equipment would be used annually for a singular maintenance operation:

- Grader
- Loader
- Diesel Aboveground Storage Tank (AST)
- Dump Truck
- Generators

1.5.1.13 Onsite Hazardous Materials During Operations

A diesel AST (approximately 10,000 gallons), diesel generators, and a generator building near the inflow chute would be used during operations. The diesel generators would provide power to the floating pump station. The Owners are currently evaluating the cost-effectiveness of a direct power supply from a power company and other options for power. These activities would be done in compliance with the requirements of a Hazardous Materials Business Plan (HMBP), Storm Water Pollution Prevention Plan (SWPPP), Spill Prevention, Control, and Countermeasure (SPCC) Plan and with the hazardous waste generator and AST regulations as described in Chapter 4.10 of the EIR.

1.5.1.14 Utilities During Operations

Electrical power would be provided by Southern California Edison (SCE) from nearby power lines.

1.5.1.15 Lighting During Operations

Except for the security lighting, no nighttime lighting is proposed and/or required.

1.5.1.16 Administration, Security, and Public Safety During Operations

The perimeter of the reservoir site would be fenced and all facilities secured. Random and frequent visits from Owners staff would provide added security.

1.6 Project Phases

Prior to the operational phase of the Project, the site must be prepared. The preparation of the site includes the excavation of a pit with sufficient capacity to meet the Project needs for water storage. After the pit has been prepared, the reservoir would be constructed. Therefore, the Project would have the following three distinct phases: Reservoir Excavation, Reservoir Facility Construction, and Reservoir Operations. The operation of the McKay Point Reservoir is described above in Section 1.5. The following sections discuss the phases of the Project that are required to construct the reservoir.

1.6.1 Reservoir Excavation

In order to construct the reservoir, the site must be excavated to a depth and surface area that meet the Project's water storage capacity requirements. This would be done by WCSG. WCSG would likely begin the reservoir excavation in the western portion of the Project site and would progress eastward. The excavated area would result in an open pit with a surface area of approximately 110 acres and a depth of approximately 60 feet bgs. Final slopes are anticipated to be approximately 3:1, horizontal:vertical (h:v) in order to minimize any bank erosion from the wind and water. Because the excavated material would be taken offsite to be processed at the adjacent WCSG facility as a marketable product, the County considers the excavation of the Project site subject to SMARA requirements for surface mining. Therefore, all activities associated with the reservoir excavation would be conducted in accordance with SMARA requirements (Figure 4 – Final Reservoir Site Plan).

Overburden is the material located above the aggregate. Initial testing indicates that the overburden would be between 6- to 12-feet deep, comprised primarily of very sandy material (60 to 80 percent) in the top 20-feet. Below 20-feet, the material is comprised largely of gravel (40 percent) and sand (40 to 48 percent), and lesser amounts of silts and clays (12 to 20 percent).

Excavation is expected to proceed at an approximate rate of 920,000 gross tons per year but could vary based on market demand. The excavation and storage of aggregate would be coordinated with WCSG such that the historical maximum production rate of the processed aggregate by WCSG would not be exceeded. Once processed, approximately 70 percent of the excavated materials would be of marketable quality, which is referred to as net tons. This means a year's excavation of 920,000 gross tons would produce approximately 644,000 net tons of marketable construction-grade aggregate.

The gross volume calculations are based on the excavation of approximately 110 acres to a depth of 60-feet bgs at the deepest point of the reservoir. The gross volume of excavated material is estimated to be 9.3 million cubic yards, of which approximately 73,200 cubic yards of material would be used as fill in association with the construction of the perimeter road. Net of fill, the Project would excavate a gross volume of approximately 9.2 million cubic yards. At an assumed density of 1.5 tons per cubic yard, this equates to 13.8 million gross tons and 9.66 million net tons of excavated material as presented in Table 2 below. This volume of excavated material is derived by comparing final basin design with pre-excavated topography. Additional cut/fill volumes would be associated with reservoir facility construction in the form of backfill against the slurry wall to achieve 3:1 final slopes. Figure 4 shows the final reservoir site plan and contours. Table 2 provides a summary of the excavation.

Table 2 Excavation Phase Summary

Gross Tons	Net Tons [1]	Area (acres)
13.8 million	9.66 million	110

[1] Net tons are the marketable construction-grade aggregate derived through processing. Net tons equate to approximately 70 percent of the gross tons processed.

1.6.1.1 Disposition of Excavated Materials

Approximately 70 percent of the excavated material is expected to be PCC-grade aggregate which can be used as aggregate and in aggregate-containing products, such as concrete and asphalt. Excavated materials would be transported by off-road trucks or a conveyor system to the adjacent Seaborn site where WCSG would process it into marketable Portland cement concrete (PCC)-grade construction materials. WCSG would also have the ability to bring a mobile processing plant onto the Project site.

Although the mining and processing activities at the Seaborn site are not part of this Project, the potential environmental impacts associated with the processing of the material excavated at the Project site in order to construct the reservoir would be considered indirect impacts.

Sand and gravel (aggregate) mining and processing activities have been conducted at the Seaborn site since the late 1940's. The WCSG production rate of the Project's excavated aggregate would not exceed the historical aggregate processing production rate (baseline) at the Seaborn site of an average of 500,000 tons per year (TPY) and a maximum of 650,000 TPY as achieved in 2005. Therefore, the number of on-road trucks transporting the material offsite on public roads to WCSG's customers would not result in an increase to the baseline number of trucks.

The overburden and excess fines resulting from the excavation of the reservoir would be stored on the Seaborn site such that the Project site could be excavated to maximum extent possible allowing for maximum water storage in the reservoir (Figure 5 – Project Site and WCSG Processing Facility). The remainder of the fines could be sold by WCSG as slurry used in nonstructural concrete or as miscellaneous fill material, as WCSG has done in the past with overburden and fines resulting from their mining activities.

1.6.1.2 Water Use and Management During Reservoir Excavation

Because the groundwater table on the Project site is at a depth of seven to 20 feet below the ground surface, water within the excavated areas would be dewatered to allow access to the excavation area by wheeled equipment. Pumped water would be stored or recirculated in ponds at the adjacent Seaborn site and/or recirculated in onsite infiltration galleries, consisting of ditches that could be covered with granular materials, where it would percolate back to groundwater. If needed, towards the end of the excavation, a slurry wall could be installed around the facility to keep the reservoir in a near dry condition. However, due to the nature of the clay material present at the site, alternatives to a slurry wall that keep the infiltration below 500 gpm may be considered.

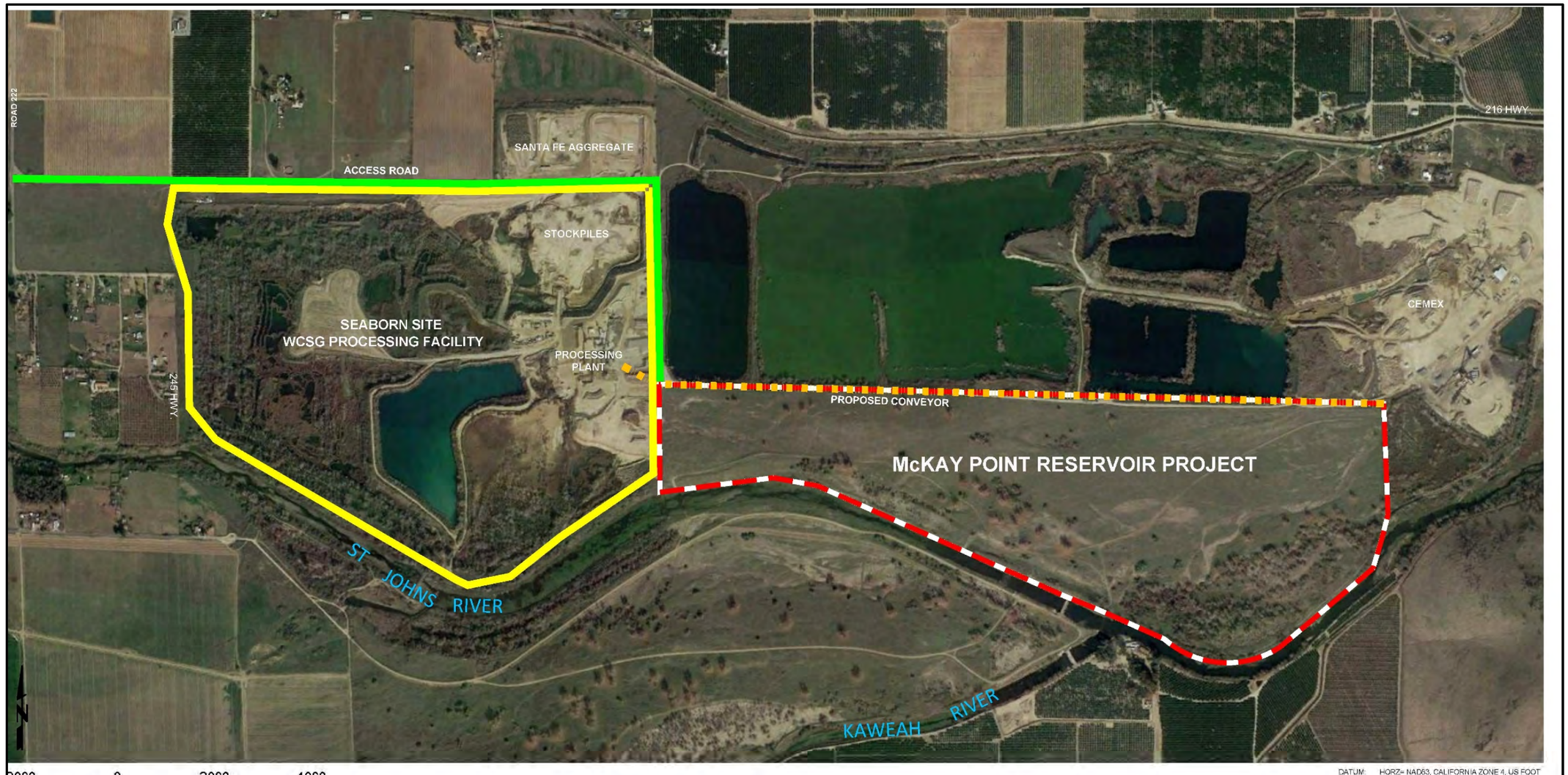
Water used at the Project site would primarily be to control fugitive dust and would be drawn from within the onsite excavation, or an adjacent pond on the Seaborn site, by pumps and applied by a water truck. Total water consumption during excavation activities would average 3.5 million gallons per year (i.e., approximately 11 acre-feet per year). The amount used daily would vary, depending on season, wind and soil conditions.

1.6.1.3 Days and Hours of Operation and Employment During Reservoir Excavation

Approximately 7 to 12 employees would be required during the excavation of the reservoir site. Excavation would occur between 4:00 a.m. (or dawn if later) and 6:00 p.m., Monday through Saturday, and continue until the desired depth and extent of excavation achieves reservoir design.

1.6.1.4 Traffic During Reservoir Excavation

Excavated materials would either be transported to the adjacent Seaborn site by off-road haul trucks or by a conveyor system. There would be no use of public roads. Once the aggregate is at the WCSG processing plant on the Seaborn site it would be processed in accordance with the regulatory requirements that apply to the Seaborn site and WCSG operations (i.e., SMARA regulations, San Joaquin Valley Air Pollution Control District (SJVAPCD) permitting and prohibitory rules). The material would be transported offsite to WCSG's customers by on-road trucks. The number of trucks on public roads associated with WCSG's sale of the processed excavated material from the Project site would not increase from the baseline level of truck traffic (160 trips per day) leaving the Seaborn site. This is because the rate that WCSG processes the Project's excavated material would not be allowed to exceed the baseline production rate from the previous operations at the Seaborn site of an average of 500,000 TPY and a maximum of 650,000 TPY as achieved in 2005.


ROAD 222
SANTA FE AGGREGATE
ACCESS ROAD
216 HWY.
STOCKPILES
SEABORN SITE
WCSG PROCESSING FACILITY
PROCESSING PLANT
CEMEX
245 HWY.
PROPOSED CONVEYOR
McKAY POINT RESERVOIR PROJECT
ST JOHNS RIVER
KAWEAH RIVER
N
2000 0 2000 4000
SCALE IN FEET
LEGEND
PROJECT SITE BOUNDARY
SEABORN SITE
ACCESS ROAD
CONVEYOR
DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/05/2018
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(805) 275-1515 • www.sespeconsulting.com
McKAY POINT RESERVOIR PROJECT SITE AND WCSG PROCESSING FACILITY
FIGURE NUMBER
5
DRAWN BY: E.CAMUS
JOB NO.: GIS
DATE: JULY 2020

The excavation phase of the Project would require only 7 to 12 employees and access would be through the Seaborn site entrance to the Project site. This would be consistent with the baseline number of employees previously required during the mining and processing activities at the Seaborn site. For evaluation purposes, it is assumed that each employee would make 2 trips per day (inbound and outbound). This would result in a maximum of 24 trips on peak days, assuming all 12 employees are onsite as compared to the 35 employee trips per day during mining and processing activities at the Seaborn site. As a result, the Project would generate only nominal traffic on public roadways, which would not result in a significant increase from baseline operations at the Seaborn site.

Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site (Figure 5 – Project Site and WCSG Processing Facility).

Note that a single-way trip is referred to as a "trip" and a round trip (going from the WCSG facility to their customers and the return trip by the truck back to the facility) is referred to as a "load" (two one-way trips).

1.6.1.5 Mobile Equipment Used During Reservoir Excavation

Excavated material would either be transported to the Seaborn site for processing by a conveyor system or off-road trucks. The equipment used during the excavation of the site would include:

- Excavator
- Off-road Haul Trucks
- D9 Dozer
- Loader
- Portable Generator
- Grader
- Water Truck
- Scraper
- Back Hoe
- Pneumatic Pumps

1.6.1.6 Onsite Hazardous Materials During Reservoir Excavation

During excavation, there would be no significant quantities of hazardous materials stored on the Project site. Fueling by use of fuel trucks and minor maintenance may occur onsite. These activities would be done in compliance with the requirements of the site SWPPP and with the hazardous material and waste generator regulations (California Code of Regulations (CCR) Title 22).

1.6.1.7 Administration, Security, and Public Safety During Reservoir Excavation

The office and restroom facilities at the adjacent Seaborn site would be used in addition to onsite portable toilets, if necessary. Security personnel would monitor the Project site during nighttime and during the weekends. The perimeter of the excavation site would be fenced and all facilities secured.

1.6.2 Reservoir Facility Construction

Construction of the reservoir would create a storage capacity of approximately 4,600 acre-feet, and would include the following components illustrated in Figure 4 – Final Reservoir Plan:

- Inflow channel – 500 cfs capacity.
- Electrically operated weir for the Inflow Channel control.

- Inflow chute.
- Energy dissipation pool - Based upon the drilling logs, it is expected bedrock would be encountered at the proposed final elevation. However, if the excavation does not get down to bedrock, installation of an energy dissipation pool at the base of the Inflow Chute would prevent the potential scouring effects of the water entering the reservoir.
- Floating barge pump – 160 cfs capacity to deliver into the Kaweah River upstream of the existing McKay Point Check Structures.
- Above-ground diesel tank, generators and generator building.
- Floating barge pump discharge piping.
- Outflow Channel – up to 900 cfs capacity gravity flow into the St. Johns River.
- Electrically operated weir for the outflow channel control.
- Slurry wall to cut off groundwater seepage into/out of the reservoir (to be installed towards the end of excavation).
- Access gate.
- Perimeter berm, perimeter road and truck turnaround (the inflow and outflow channels will pass under the perimeter road in concrete structures).

The inflow and outflow structures would require excavation and grading to prepare the site for installation. Inflow/outflow grading would consist of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards, and the placement of approximately 9,000 cubic yards of rip-rap. Construction of the in/out-flow building would consist of finish grading and minor excavation of approximately 600 cubic yards and the placement of approximately 1,100 cubic yards of concrete. Construction of the reservoir is further discussed in Chapter 4.3.5.4 – Construction Phase Emissions in the DEIR.

The Department of Water Resources (DWR), Division of Safety of Dams has jurisdiction over projects that create a dam over 25-feet in height or will have an impounding capacity of 50 acre-feet or more (Water Code Section 6002). However, artificial barriers less than 6-feet in height, or that have a storage capacity of less than 15 acre-feet are not considered dams subject to DWR jurisdiction (Water Code Sections 6003, 6025). The retention of water within the reservoir would be below grade and would not require the use of artificial barriers greater than 6-feet in height. Therefore, the Project does not exceed these criteria and is not regulated as a dam. The excavation of the pit for the construction of the reservoir would meet the engineering and safety requirements as set forth in SMARA.

1.6.2.1 Slurry Walls

Depending upon the amount of groundwater seepage, towards the end of the excavation process, a slurry wall may need to be installed around the reservoir's perimeter to minimize groundwater seepage into/out of the reservoir. Slurry walls are below-grade walls that restrict groundwater flow or support excavations and structures, using soil-bentonite or cement-bentonite. If needed, a slurry wall would be installed to slow or eliminate groundwater from flowing into the reservoir during construction, and to maintain an evacuated

state as part of the long-term operations (i.e., a full reservoir has limited water re-regulation value). However, due to the nature of the clay material present at the site, alternatives to a slurry wall that keep the infiltration below 500 gpm may be considered.

Once the slurry wall is installed around the reservoir, the Owners would minimize the dewatering flows to approximately 500 gpm during reservoir facility construction and long-term reservoir operation. The slurry wall would be a permanent fixture of the reservoir facility and would serve as an essential feature to maintain dewatered storage space to receive water diversions by the Owners.

Slurry wall construction consists of clearing and grubbing approximately 26 acres, excavating approximately 109,000 cubic yards of native soil, and poring of the slurry wall into the excavated trench. Excavated soils would be hauled to an onsite screening/mixing site and screened for use in the slurry wall mix. Approximately 4,000 dry tons of bentonite and 56,000 tons of silty/clay fines would be delivered to the site for use in the slurry wall. Excess native soils would either be spread or stored onsite. Construction slurry consisting of a bentonite-water slurry would be pumped into the trench to hold the sides of the trench open during construction. A mixture of bentonite, imported silty/clay fines and native soil would be used for the final slurry wall. The slurry wall material would be hauled from the mixing site and placed into the trench. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the slurry wall. Chapter 4.3.5, Table 4.3-15 – Slurry Wall Excavation and Installation in the DEIR provides additional detail on the construction of the slurry wall.

1.6.2.2 Days and Hours of Operation and Employment During Construction

Approximately 7 to 12 employees would be required during the construction of the reservoir facilities, which would occur between 4:00 a.m., or dawn if later, and 6:00 p.m., Monday through Saturday, until completed. Nighttime construction activities are not proposed.

1.6.2.3 Traffic During Construction

The Project would only require 7 to 12 employees during the construction of the reservoir; therefore, the number of employees traveling to the site would be minimal and consistent with the baseline number of employees previously required during the mining activities at the Seaborn site. Each employee is assumed to make 2 trips per day (inbound and outbound), which would result in a maximum increase of 24 trips on peak days, assuming all 12 employees are onsite. Access for reservoir facility construction employees and service vehicles would be via Road 222, through the Seaborn site entrance to the Project site. As a result, the Project would generate only nominal traffic on public roadways, which would be comparable to that being experienced during the Seaborn site mining and processing operations.

1.6.2.4 Mobile Equipment Used During Construction

The equipment used for the construction of the reservoir facilities, such as inlet and outlet features, includes:

- Excavator
- Backhoe
- Water Truck
- Loader
- Compactor
- Cement Trucks
- Cranes
- Trenchers
- Portable Generators

- Grader
- Cement Pumps
- Pneumatic Pumps

1.6.2.5 Onsite Hazardous Materials During Construction

During construction, there would not be significant quantities of hazardous materials stored on the Project site. Fueling by use of fuel trucks and minor maintenance may occur onsite. These activities would be done in compliance with the requirements of a site SWPPP and with the hazardous material and hazardous waste generator regulations.

1.6.2.6 Utilities During Construction

Electrical power would be provided by SCE from nearby power lines.

1.6.2.7 Lighting During Construction

Except for the security lighting, no nighttime lighting is proposed and/or required.

1.6.2.8 Administration, Security, and Public Safety During Construction

The office and restroom facilities at the adjacent Seaborn site would be used in addition to onsite portable toilets, if necessary. Security personnel would monitor the Project site during the weekends and at night. The perimeter of the excavation site would be fenced and all facilities secured.

1.6.3 Background and Relationship to the Seaborn Site and WCSG Processing Facility

As discussed above, the material excavated from the Project would be transported to the adjacent Seaborn site where the aggregate would be processed by WCSG. Off-road haul trucks or a conveyor system located on the Project site would be used to transport excavated material to the Seaborn site. The transportation of material to the WCSG processing facility would not require the any haul trucks to use public roads. The Project would not result in additional haul trucks on public roadways.

Surface mining and the processing of aggregates has occurred at the Seaborn site since 1948. The first use permit for the Seaborn site was issued by the County in 1958. Subsequent expansions to the mine site were approved in 1963 (M-2 UP#63-21) and in 1966 (M-2 UP#66-11). Following the adoption of SMARA, a Surface Mining Reclamation Plan (PMR 79-04) was approved for the Seaborn site in 1980. The 1980 Reclamation Plan described the reclaimed end use of the property as a lake with stable slopes and vegetation along the banks. In 2001, an amendment to the approved Reclamation Plan was granted by the County authorizing the use of an additional 20 acres to the north of the Seaborn site for the storage of processed aggregate, rock crusher parts and heavy equipment storage. The 2001 amendment only modified the PMR 79-04 to address the 20-acre stockpile area and described final reclamation of the 20-acre area as the removal of all equipment and product stockpiles, followed by a return to its pre-site disturbance use of irrigated pasture.

The mining, processing and reclamation activities at the Seaborn site are not part of this Project. However, the potential impacts associated with the transportation to and processing of the aggregate excavated to construct the Project reservoir are evaluated in this DEIR. The previous production rates and traffic records from the Seaborn processing activities have been reviewed and are used in this CEQA evaluation to identify

the existing environmental baseline for comparison purposes to determine the change from baseline and potential impacts that this Project would have.

1.7 Reclamation Plan

As discussed above, because the excavated material taken from the Project site would be sold as a marketable product, the excavation phase of the Project would require a Surface Mining Permit and the preparation and County approval of a Reclamation Plan in accordance with the requirements of SMARA and the Tulare County Zoning Ordinance, Chapter 25 (Surface and Mining Reclamation). Section 7-25-1085 of the County Ordinance Code (Permit) states as follows:

> *Except as provided in sections 7-25-1090 and 7-25-1095 of this Article, any person who proposes to engage in surface mining operations within the unincorporated area of Tulare County shall, prior to the commencement of such operations, obtain a permit to mine,* approval of a reclamation plan and approval of financial assurances in accordance with the provisions of this Chapter*, the Act and the regulations.* (emphasis added)

A Reclamation Plan was prepared for review and comment by the Division of Mine Reclamation (DMR), and review and approval by the County as the SMARA Lead Agency. The Reclamation Plan was developed in compliance with the reclamation standards set forth in SMARA Regulations (14 CCR Sections 3700 to 3713). The identified end use of the excavation is the creation of the McKay Point Reservoir to be used as a surface water storage/re-regulation reservoir. The reservoir can also be used to optimize groundwater recharge within the Owners service areas.

APPENDIX A-3

Notice of Completion / Notice of Availability

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

NOTICE OF AVAILABILITY (NOA) / NOTICE OF INTENT (NOI) TO ADOPT A DRAFT EIR (EIR) FOR THE MCKAY POINT RESERVOIR PROJECT (SCH #2014011078)

DATE: March 1, 2024

TO: Interested Agencies, Organizations, and Individuals

FROM / LEAD AGENCY: Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

SUBJECT: Notice of Availability and Public Comment Period of a Draft Environmental Impact Report

The Tulare Irrigation District (TID), as the Lead Agency under the California Environmental Quality Act (CEQA), has prepared a Draft Environmental Impact Report (Draft EIR) that identifies and evaluates the environmental impacts of the proposed McKay Point Reservoir Project. The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. TID releases this Notice of Availability (NOA) / Notice of Intent (NOI) to open the 45-day public comment period for the EIR, in accordance with CEQA.

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake. The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the Project area are mining, agricultural, and residential. The adjacent lands to the north, northeast, southwest and west are currently being used for aggregate mining operations, and the areas south and east of the Project site are used intensively for agricultural and, to a limited extent, for rural residential purposes.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

TID is the Project applicant on behalf of the Owners and is the CEQA Lead Agency. The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.

- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet as part of the proposed Project.
- Deliver water to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCSG to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the construction and development costs.

A detailed Project Description can be found within the Draft EIR.

Public Review and Comment Period: The circulation of the Draft EIR is to disclose information and encourage written public comments. TID invites public comments on the Draft EIR during a 45-day public comment period, beginning on March 1, 2024, and ending on April 15, 2024. When providing comments, please include your name, the name of your agency or organization (if applicable), and contact information.

The Draft EIR can be obtained electronically at the following website: https://tulareid.org/. Physical copies of the Draft EIR can also be accessed Monday-Friday, 8:00 a.m. to 5:00 p.m. at the following location:

Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

Comments on the Draft EIR may be submitted via e-mail to gstephens@sespe.com, or via U.S. mail to:

Sespe Consulting, Inc.
Attn: Graham Stephens
374 Poli Street, Suite 200
Ventura, CA 93001

If you have questions or require additional information, please contact Graham Stephens, Project Manager, at (805) 275-1515 or via email at gstephens@sespe.com.

Public Hearing: TID will schedule a public hearing to consider adoption of the EIR at a future date. In advance of the hearing date, TID will distribute a separate notice regarding that hearing.

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2014011078

Project Title: McKay Point Reservoir Project

Lead Agency: Tulare Irrigation District | Contact Person: Aaron Fukuda
Mailing Address: 6826 Avenue 240 | Phone: (559) 686-3425
City: Tulare, CA | Zip: 93274 | County: Tulare

Project Location: County: Tulare | City/Nearest Community: Lemon Cove (1.0 miles away), Woodlake (2.5 miles away)
Cross Streets: Access via State Highway 216, midway between Road 228 and State Highway 198 | Zip Code: 93286
Longitude/Latitude (degrees, minutes and seconds): 36 ° 23 ′ 30 ″ N / 119 ° 02 ′ 50 ″ W Total Acres: 200
Assessor's Parcel No.: 113-070-016; 113-080-005, 008; 113-090-001; 113-100-002 Section: 3 and 4 Twp.: 18 South Range: 27 East Base: MDB&M
Within 2 Miles: State Hwy #: 216 and 198 Waterways: St. John River and Kaweah River
Airports: None Railways: None Schools: Sequoia Union Elementary

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Reclamation Plan

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type
☒ Mining: Mineral Sand and Gravel
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type
☒ Other: Reservoir Development and Operation

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☒ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☐ Coastal Zone ☒ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☒ Flood Plain/Flooding ☒ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☒ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☒ Schools/Universities ☒ Septic Systems ☒ Sewer Capacity ☒ Soil Erosion/Compaction/Grading ☒ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation
☒ Vegetation ☒ Water Quality ☒ Water Supply/Groundwater ☒ Wetland/Riparian ☒ Growth Inducement ☒ Land Use ☒ Cumulative Effects ☐ Other:

Present Land Use/Zoning/General Plan Designation:

Zone: AE-20 (Exclusive Agriculture, 20 Ac Min); General Plan: Valley Agriculture, Mineral Resource Area (MRZ-2a)

Project Description: *(please use a separate page if necessary)*

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC), as joint owners (Owners), propose to construct and operate the McKay Point Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns rivers near McKay Point in Tulare County, California. The reservoir would serve as a surface water storage and re-regulation reservoir and would: 1) receive water immediately upstream of the divergence of the St. Johns and Kaweah rivers, 2) provide a water storage capacity of approximately 4,600 acre-feet, 3) deliver water to the St. Johns River and the Lower Kaweah River, as needed; and, 4) provide additional storage capacity for storm water layoff and flood prevention. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

S	Air Resources Board	S	Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
S	California Highway Patrol		Pesticide Regulation, Department of
S	Caltrans District # 6		Public Utilities Commission
	Caltrans Division of Aeronautics	S	Regional WQCB # 5
	Caltrans Planning		Resources Agency
S	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
S	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of	S	SWRCB: Water Quality
S	Energy Commission		SWRCB: Water Rights
S	Fish & Game Region # 4		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of	S	Water Resources, Department of
	General Services, Department of		
	Health Services, Department of	S	Other: Tulare County; and, San Joaquin Valley APCD
	Housing & Community Development	S	Other: Army Corps of Engineers; and, US Fish and Wildlife Service
S	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date March 1, 2024 Ending Date April 15, 2024

Lead Agency (Complete if applicable):

Consulting Firm: Sespe Consulting, Inc.
Address: 374 Poli Street, Suite 200
City/State/Zip: Ventura, CA 93001
Contact: Graham Stephens
Phone: (805) 275-1515

Applicant: Tulare Irrigation District
Address: 6826 Avenue 240
City/State/Zip: Tulare, CA 93274
Phone: (559) 686-3425

Signature of Lead Agency Representative: _____ **Date:** _____

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Print From

Summary Form for Electronic Document Submittal

Form F

Lead agencies may include 15 hardcopies of this document when submitting electronic copies of Environmental Impact Reports, Negative Declarations, Mitigated Negative Declarations, or Notices of Preparation to the State Clearinghouse (SCH). The SCH also accepts other summaries, such as EIR Executive Summaries prepared pursuant to CEQA Guidelines Section 15123. Please include one copy of the Notice of Completion Form (NOC) with your submission and attach the summary to each electronic copy of the document.

SCH #: 2014011078

Project Title: McKay Point Reservoir Project

Lead Agency: Tulare Irrigation District

Contact Name: Aaron Fukuda

Email: akf@tulareid.org Phone Number: (559) 686-3425

Project Location: Near the unincorporated communities of Lemon Cove and Woodlake, in Tulare County

City *County*

Project Description (Proposed actions, location, and/or consequences).

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC), as joint owners (Owners), propose to construct and operate the McKay Point Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns rivers near McKay Point in Tulare County, California. The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir reservoir would be used as a surface water storage and re-regulation reservoir and would: 1) receive water immediately upstream of the divergence of the St. Johns and Kaweah rivers, 2) provide a water storage capacity of approximately 4,600 acre-feet, 3) deliver water to the St. Johns River or the Lower Kaweah River, as needed; and, 4) provide additional storage capacity for storm water layoff and flood prevention. The reservoir would also be used to optimize groundwater recharge within the Owners service areas. See Section 2.0 of the Draft EIR for additional detail.

Identify the project's significant or potentially significant effects and briefly describe any proposed mitigation measures that would reduce or avoid that effect.

Project environmental factors/resource areas found to have either "no impact" or "less than significant impact" with no mitigation necessary include the following:

- Aesthetics	- Agriculture and Forestry Resources	- Energy
- Greenhouse Gases	- Hazards and Hazardous Materials	- Hydrology and Water Quality
- Land Use and Planning	- Mineral Resources	- Population and Housing
- Public Services	- Recreation	- Transportation
- Tribal Cultural Resources	- Utilities and Service Systems	- Wildfire

Project environmental factors/resource areas found to have a "less than significant impact with the implementation of mitigation measures" include the following:

- Air Quality: Mitigation measure for fugitive dust control.
- Biological Resources: Standard mitigation measures for various plant and wildlife species, and jurisdictional waters.
- Cultural Resources: Standard mitigation measures for managing a find of cultural resources.
- Geology and Soils: Mitigation measures for managing a find of a paleontological resource.
- Noise and Vibration: Mitigation measure for short-term construction and onsite material processing noise.

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

The following list provides a brief summary of the areas of known controversy or issues of concern based on the comments received during the scoping period (10/02/2020 - 11/04/2020):
- Reclamation Plan;
- Potential impacts to real estate and quality of life;
- Permit requirements, specifically Central Valley Flood Protection Board encroachment permit and US Army Corp of Engineers 404 permit;
- Details of the excavation of the pit for the construction of the reservoir;
- Drought conditions and water supply; and
- Impacts to local groundwater wells.

Two (2) public scoping meetings were also held on October 15 and 16, 2020. Complete copies of the letters/emails received during the scoping period are provided in the Scoping Report (Appendix A in the Draft EIR). These comments will be incorporated into the EIR Administrative Record for the Project and are addressed in the Draft EIR, as appropriate.

Provide a list of the responsible or trustee agencies for the project.

Federal Agencies:
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State Agencies:
- California Department of Conservation (DOC), Division of Mine Reclamation (DMR)
- Water Quality Control Board, Central Valley (Region 5)
- California Department of Fish and Wildlife (CDFW)
- California Department of Transportation (Caltrans)

Local Agencies:
- Tulare County, Resource Management Agency (RMA)
- San Joaquin Valley Air Pollution Control District (SJVAPCD)

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

NOTICE OF AVAILABILITY (NOA) / NOTICE OF INTENT (NOI) TO ADOPT A DRAFT EIR (EIR) FOR THE MCKAY POINT RESERVOIR PROJECT (SCH #2014011078)

DATE: March 1, 2024

TO: Interested Agencies, Organizations, and Individuals

FROM / LEAD AGENCY: Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

SUBJECT: Notice of Availability and Public Comment Period of a Draft Environmental Impact Report

The Tulare Irrigation District (TID), as the Lead Agency under the California Environmental Quality Act (CEQA), has prepared a Draft Environmental Impact Report (Draft EIR) that identifies and evaluates the environmental impacts of the proposed McKay Point Reservoir Project. The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. TID releases this Notice of Availability (NOA) / Notice of Intent (NOI) to open the 45-day public comment period for the EIR, in accordance with CEQA.

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake. The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

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Project Summary: The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir (the proposed Project). The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Sand and Gravel (WCSG) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

TID is the Project applicant on behalf of the Owners and is the CEQA Lead Agency. The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah at the proposed Project site.

- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah at the proposed Project site.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners at the proposed Project site.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners at the proposed Project site.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests at the proposed Project site.
- Constructing the reservoir at the proposed Project site in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to and north of the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines as part of the proposed Project.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet as part of the proposed Project.
- Deliver water to the Lower Kaweah River or the St. Johns River using an electrically operated weir channel and pump(s), as needed.
- Provide additional storage capacity at the proposed Project site for storm water layoff and flood prevention.
- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCSG to excavate at the proposed Project site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the construction and development costs.

A detailed Project Description can be found within the Draft EIR.

Public Review and Comment Period: The circulation of the Draft EIR is to disclose information and encourage written public comments. TID invites public comments on the Draft EIR during a 45-day public comment period, beginning on March 1, 2024, and ending on April 15, 2024. When providing comments, please include your name, the name of your agency or organization (if applicable), and contact information.

The Draft EIR can be obtained electronically at the following website: https://tulareid.org/. Physical copies of the Draft EIR can also be accessed Monday-Friday, 8:00 a.m. to 5:00 p.m. at the following location:

Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

Comments on the Draft EIR may be submitted via e-mail to gstephens@sespe.com, or via U.S. mail to:

Sespe Consulting, Inc.
Attn: Graham Stephens
374 Poli Street, Suite 200
Ventura, CA 93001

If you have questions or require additional information, please contact Graham Stephens, Project Manager, at (805) 275-1515 or via email at gstephens@sespe.com.

Public Hearing: TID will schedule a public hearing to consider adoption of the EIR at a future date. In advance of the hearing date, TID will distribute a separate notice regarding that hearing.

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2014011078

Project Title: McKay Point Reservoir Project

Lead Agency: Tulare Irrigation District | Contact Person: Aaron Fukuda
Mailing Address: 6826 Avenue 240 | Phone: (559) 686-3425
City: Tulare, CA | Zip: 93274 | County: Tulare

Project Location: County: Tulare | City/Nearest Community: Lemon Cove (1.0 miles away), Woodlake (2.5 miles away)
Cross Streets: Access via State Highway 216, midway between Road 228 and State Highway 198 | Zip Code: 93286
Longitude/Latitude (degrees, minutes and seconds): 36 ° 23 ′ 30 ″ N / 119 ° 02 ′ 50 ″ W Total Acres: 200
Assessor's Parcel No.: 113-070-016; 113-080-005, 008; 113-090-001; 113-100-002 Section: 3 and 4 Twp.: 18 South Range: 27 East Base: MDB&M
Within 2 Miles: State Hwy #: 216 and 198 Waterways: St. John River and Kaweah River
Airports: None Railways: None Schools: Sequoia Union Elementary

Document Type:

CEQA: ☐ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☒ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other:
NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI
Other: ☐ Joint Document ☐ Final Document ☐ Other:

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Reclamation Plan

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational:
☐ Recreational:
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type
☒ Mining: Mineral Sand and Gravel
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type
☒ Other: Reservoir Development and Operation

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☒ Agricultural Land ☒ Air Quality ☒ Archeological/Historical ☒ Biological Resources ☐ Coastal Zone ☒ Drainage/Absorption ☐ Economic/Jobs
☐ Fiscal ☒ Flood Plain/Flooding ☒ Forest Land/Fire Hazard ☒ Geologic/Seismic ☒ Minerals ☒ Noise ☒ Population/Housing Balance ☒ Public Services/Facilities
☒ Recreation/Parks ☒ Schools/Universities ☒ Septic Systems ☒ Sewer Capacity ☒ Soil Erosion/Compaction/Grading ☒ Solid Waste ☒ Toxic/Hazardous ☒ Traffic/Circulation
☒ Vegetation ☒ Water Quality ☒ Water Supply/Groundwater ☒ Wetland/Riparian ☒ Growth Inducement ☒ Land Use ☒ Cumulative Effects ☐ Other:

Present Land Use/Zoning/General Plan Designation:

Zone: AE-20 (Exclusive Agriculture, 20 Ac Min); General Plan: Valley Agriculture, Mineral Resource Area (MRZ-2a)

Project Description: *(please use a separate page if necessary)*

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC), as joint owners (Owners), propose to construct and operate the McKay Point Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns rivers near McKay Point in Tulare County, California. The reservoir would serve as a surface water storage and re-regulation reservoir and would: 1) receive water immediately upstream of the divergence of the St. Johns and Kaweah rivers, 2) provide a water storage capacity of approximately 4,600 acre-feet, 3) deliver water to the St. Johns River and the Lower Kaweah River, as needed; and, 4) provide additional storage capacity for storm water layoff and flood prevention. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with and "**X**".
If you have already sent your document to the agency please denote that with an "**S**".

S	Air Resources Board	S	Office of Historic Preservation
	Boating & Waterways, Department of		Office of Public School Construction
	California Emergency Management Agency		Parks & Recreation, Department of
S	California Highway Patrol		Pesticide Regulation, Department of
S	Caltrans District # 6		Public Utilities Commission
	Caltrans Division of Aeronautics	S	Regional WQCB # 5
	Caltrans Planning		Resources Agency
S	Central Valley Flood Protection Board		Resources Recycling and Recovery, Department of
	Coachella Valley Mtns. Conservancy		S.F. Bay Conservation & Development Comm.
	Coastal Commission		San Gabriel & Lower L.A. Rivers & Mtns. Conservancy
	Colorado River Board		San Joaquin River Conservancy
S	Conservation, Department of		Santa Monica Mtns. Conservancy
	Corrections, Department of		State Lands Commission
	Delta Protection Commission		SWRCB: Clean Water Grants
	Education, Department of	S	SWRCB: Water Quality
S	Energy Commission		SWRCB: Water Rights
S	Fish & Game Region # 4		Tahoe Regional Planning Agency
	Food & Agriculture, Department of		Toxic Substances Control, Department of
	Forestry and Fire Protection, Department of	S	Water Resources, Department of
	General Services, Department of		
	Health Services, Department of	S	Other: Tulare County; and, San Joaquin Valley APCD
	Housing & Community Development	S	Other: Army Corps of Engineers; and, US Fish and Wildlife Service
S	Native American Heritage Commission		

Local Public Review Period (to be filled in by lead agency)

Starting Date March 1, 2024 Ending Date April 15, 2024

Lead Agency (Complete if applicable):

Consulting Firm: Sespe Consulting, Inc.
Address: 374 Poli Street, Suite 200
City/State/Zip: Ventura, CA 93001
Contact: Graham Stephens
Phone: (805) 275-1515

Applicant: Tulare Irrigation District
Address: 6826 Avenue 240
City/State/Zip: Tulare, CA 93274
Phone: (559) 686-3425

Signature of Lead Agency Representative: _____ **Date:** _____

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

Print From

Summary Form for Electronic Document Submittal

Form F

Lead agencies may include 15 hardcopies of this document when submitting electronic copies of Environmental Impact Reports, Negative Declarations, Mitigated Negative Declarations, or Notices of Preparation to the State Clearinghouse (SCH). The SCH also accepts other summaries, such as EIR Executive Summaries prepared pursuant to CEQA Guidelines Section 15123. Please include one copy of the Notice of Completion Form (NOC) with your submission and attach the summary to each electronic copy of the document.

SCH #: 2014011078

Project Title: McKay Point Reservoir Project

Lead Agency: Tulare Irrigation District

Contact Name: Aaron Fukuda

Email: akf@tulareid.org Phone Number: (559) 686-3425

Project Location: Near the unincorporated communities of Lemon Cove and Woodlake, in Tulare County

City *County*

Project Description (Proposed actions, location, and/or consequences).

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC), as joint owners (Owners), propose to construct and operate the McKay Point Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns rivers near McKay Point in Tulare County, California. The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir reservoir would be used as a surface water storage and re-regulation reservoir and would: 1) receive water immediately upstream of the divergence of the St. Johns and Kaweah rivers, 2) provide a water storage capacity of approximately 4,600 acre-feet, 3) deliver water to the St. Johns River or the Lower Kaweah River, as needed; and, 4) provide additional storage capacity for storm water layoff and flood prevention. The reservoir would also be used to optimize groundwater recharge within the Owners service areas. See Section 2.0 of the Draft EIR for additional detail.

Identify the project's significant or potentially significant effects and briefly describe any proposed mitigation measures that would reduce or avoid that effect.

Project environmental factors/resource areas found to have either "no impact" or "less than significant impact" with no mitigation necessary include the following:

- Aesthetics	- Agriculture and Forestry Resources	- Energy
- Greenhouse Gases	- Hazards and Hazardous Materials	- Hydrology and Water Quality
- Land Use and Planning	- Mineral Resources	- Population and Housing
- Public Services	- Recreation	- Transportation
- Tribal Cultural Resources	- Utilities and Service Systems	- Wildfire

Project environmental factors/resource areas found to have a "less than significant impact with the implementation of mitigation measures" include the following:

- Air Quality: Mitigation measure for fugitive dust control.
- Biological Resources: Standard mitigation measures for various plant and wildlife species, and jurisdictional waters.
- Cultural Resources: Standard mitigation measures for managing a find of cultural resources.
- Geology and Soils: Mitigation measures for managing a find of a paleontological resource.
- Noise and Vibration: Mitigation measure for short-term construction and onsite material processing noise.

If applicable, describe any of the project's areas of controversy known to the Lead Agency, including issues raised by agencies and the public.

The following list provides a brief summary of the areas of known controversy or issues of concern based on the comments received during the scoping period (10/02/2020 - 11/04/2020):
- Reclamation Plan;
- Potential impacts to real estate and quality of life;
- Permit requirements, specifically Central Valley Flood Protection Board encroachment permit and US Army Corp of Engineers 404 permit;
- Details of the excavation of the pit for the construction of the reservoir;
- Drought conditions and water supply; and
- Impacts to local groundwater wells.

Two (2) public scoping meetings were also held on October 15 and 16, 2020. Complete copies of the letters/emails received during the scoping period are provided in the Scoping Report (Appendix A in the Draft EIR). These comments will be incorporated into the EIR Administrative Record for the Project and are addressed in the Draft EIR, as appropriate.

Provide a list of the responsible or trustee agencies for the project.

Federal Agencies:
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State Agencies:
- California Department of Conservation (DOC), Division of Mine Reclamation (DMR)
- Water Quality Control Board, Central Valley (Region 5)
- California Department of Fish and Wildlife (CDFW)
- California Department of Transportation (Caltrans)

Local Agencies:
- Tulare County, Resource Management Agency (RMA)
- San Joaquin Valley Air Pollution Control District (SJVAPCD)

Tulare County
Resource Management Agency
5961 South Mooney Boulevard
Visalia, CA 93277

City of Visalia
Natural Resource Conservation Division
315 E. Acequia Avenue
Visalia, CA 93291

City of Exeter
Planning Department
137 N. "F" Street
Exeter, CA 93221

State Clearinghouse
Attn: Environmental Review
1400 10th Street
Sacramento, CA 95814

Caltrans
District 6
P.O. Box 12616
Fresno, CA 93778

Air Resources Control Board
Attn: Environmental Review
P.O. Box 2815
Sacramento, CA 95812

Department of Conservation
Attn: Environmental Review
715 "P" Street, MS 1900
Sacramento, CA 95814

California Dept. of Water Resources
Attn: Environmental Review
P.O. Box 942836
Sacramento, CA 94236

California Water Service Company
216 N. Valley Oaks Drive
Visalia, CA 93292

Southern California Edison
Attn: Environmental Review
2425 S. Blackstone Street
Tulare, CA 93274

Kaweah Delta Water Conservation Dist.
2975 Farmersville Road
Farmersville, CA 93223

City of Woodlake
Planning Department
350 N. Valencia Avenue
Woodlake, CA 93286

U.S. Army Corp of Engineers (USACE)
Sacramento District
Attn: Environmental Review
1325 "J" Street, Room 1513
Sacramento, CA 95814

California RWQCB
Region 5 – Central Valley
Attn: Environmental Review
1685 "E" Street
Fresno, CA 93706

California Depart. of Fish & Wildlife
Central Region (4)
Attn: Environmental Review
1234 E. Shaw Avenue
Fresno, CA 93710

San Joaquin Valley AQMD
Southern Region
Attn: Environmental Review
34946 Flyover Court
Bakersfield, CA 93308

Department of Conservation
California Geological Survey
Attn: Environmental Review
715 "P" Street, MS 1901
Sacramento, CA 95814

California Energy Commission
Media & Public Communications Office
715 "P" Street
Sacramento, CA 95814

Department of Conservation
State Mining and Geology Board
Attn: Environmental Review
715 "P" Street, MS 1905
Sacramento, CA 95814

Pacific Gas & Electric
Attn: Environmental Review
3754 E. California Avenue
Fresno, CA 93725

City of Visalia
Planning Department
315 E. Acequia Avenue
Visalia, CA 93291

City of Farmersville
909 W. Visalia Road
Farmersville, CA 93223

U.S. Fish & Wildlife Office
Sacramento Fish & Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812

CA Native American Heritage Comm.
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691

California Highway Patrol
Central Division
Attn: Environmental Review
5179 N. Gates Avenue
Fresno, CA 93722

California Dept. of Parks & Recreation
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Central Valley Flood Protection Board
Attn: Environmental Review
3310 El Camino Avenue, Suite 170
Sacramento, CA 95821

Southern California Edison
Attn: Environmental Review
P.O. Box 800
Rosemead, CA 91770

Pacific Gas and Electric Company
P.O. Box 997300
Sacramento, CA 95899

Tule River Indian Tribe
Attn: Neil Peyron
P.O. Box 589
Porterville, CA 93258

Santa Rosa Tachi Rancheria
Attn: Environmental Review
P.O. Box 8
Lemoore, CA 93245

Wuksache Intiman Tribe/
Eshorn Valley Band
Attn: Kenneth Woodrow
1179 Rockhaven Court
Salinas, CA 93906

Tule River Indian Tribe
Attn: Kerri Vera, Director
P.O. Box 589
Porterville, CA 93258

Wuksache Tribe
Attn: John Sartuche
1028 E. "K" Street
Visalia, CA 93292

Tule River Indian Tribe
Attn: Joey Garfield
P.O. Box 589
Porterville, CA 93258

RMC Lonestar
24325 Lomitas Drive
Lemon Cove, CA 93244

Industrial Asphalt Inc.
24325 Lomitas Drive
Lemon Cove, CA 93244

Santa Fe Aggregates Inc.
22400 Avenue 335
Woodlake, CA 93286

Glen Wells Construction Co. Inc.
22400 Avenue 335
Woodlake, CA 93286

USA FNMA
P.O. Box 650043
Dallas, TX 75265

John P & Aline M Moran
455 E. Maple Street
Exeter, CA 93221

Antelope Heights Water & Irrigation Dist.
P.O. Box 191
Woodlake, CA 93286

MJC Properties Inc.
Attn: Milton E. Linder
P.O. Box 44063
Lemon Cove, CA 93244

Lonestar California Inc.
1501 Belvedere Road
West Palm Beach, FL 33406

Rocky Hill Inc.
P.O. Box 175
Exeter, CA 93221

Rodney Jr. & Jannelle Anne Engel
P.O. Box 30130
Mesa, AZ 85275

David A. & Carol Cairns
P.O. Box 44259
Lemon Cove, CA 93244

AG Kensington LLC
444 N. Prospect
Porterville, CA 93257

Cairns Ranch Co.
33374 Lerdo Highway
Bakersfield, Ca 93308

Borghild Corp.
125 Carmel Street
San Francisco, CA 94117

Lemon Cove Sanitary District
P.O. Box 74
Lemon Cove, CA 93244

Wutchumna Water Co.
Attn: Dave Hengst
598 S. Valencia Boulevard
Woodlake, CA 93286

Jean L. Steuart
365 Tillicum Drive
Silverton, OR 97381

Frank and Karin Callahan
P.O. Box 44003
Lemon Cove, CA 93244

Beresford Corporation
582 Market Street, #912
San Francisco, CA 94104

Kaweah Packing, LLC
P.O. Box 25430
Fresno, CA 93729

William and Margret Pensar
P.O. Box 44151
Lemon Cove, CA 93244

Current Property Owner
P.O. Box 44035
Lemon Cove, CA 93244

George Clausen
24207 Lomitas Drive, #D
Woodlake, CA 93286

Del Strange
464 E. Jackson
Tulare, CA 93274

Larry and Debbie Johnson
24205 Lomitas Drive
Woodlake, CA 93286

Wyane and Pamela Weller
20026 Avenue 306
Exeter, CA 93221

Waldin and Euneeta Martin
P.O. Box 44343
Lemon Cove, CA 93244

Elsie Linder
P.O. Box 696
Visalia, CA 93279

James & Rae Wohlford
24186 Lomitas Drive
Woodlake, CA 93286

Eric Shannon
11878 Avenue 328
Visalia, CA 93291

Charles and Micaela Brown
P.O. Box 44342
Lemon Cove, CA 93244

Ronald & Ramona Beggs
297 High Sierra Drive
Exeter, CA 93221

Gary and Beverly Bohnisch
P.O. Box 947
Lindsay, CA 93247

QK Inc.
Attn: Barry Lindner
901 East Main Street
Visalia, CA 93292

Lemon Cove Water Co.
Attn: Bill Pensar
P.O. Box 44374
Lemon Cove, CA 93244

Tulare County Farm Bureau
Attn: Tricia Stever Blattler
737 N. Ben Maddox Way
Visalia, CA 93292

John Kirkpatrick
23114 Carson Avenue
Exeter, CA 93221-9744

Lemon Cove Sanitary District
Attn: Michael Lampman
P.O. Box 44374
Lemon Cove, CA 93244

Nancy Lang
125 Carmel Street
San Francisco, CA 94117

Teichert Materials
Attn: Doug Reynolds
P.O. Box 515
Woodlake, CA 93286

Teichert Materials
Attn: Michelle Cunningham
P.O. Box 515
Woodlake, CA 93286

Kaweah South (Agg)
32748 Road 212
Woodlake, CA 93268

Neumiller & Beardslee
Attn: Rod Attebery
P.O. Box 20
Stockton, CA 95201

Kaweah Delta Water Conservation Dist.
Attn: Mark Larsen
2975 Farmersville Road
Farmersville, CA 93223

Santa Fe Aggregates Inc.
Attn: Doug Reynolds
P.O. Box 515
Woodlake, CA 93286

Doug Reynolds
407 Castanya Court
Danville, CA 94526

Teichert Materials
Attn: Michelle Cunningham
3500 American River Drive
Sacramento, CA 95864

Waterford Properties
Attn: Troy Reimche
3500 American River Drive
Sacramento, CA 95864

Big Sandy Rancheria of Western Mono Indians
Attn: Elizabeth D. Kipp
P.O. Box 337
Auberry, CA 93602

Kern Valley Indian Community – Kawaiisu Tubatulabal
Attn: Brandy Kendricks
30741 Fox Ridge Court
Tehachapi, CA 93561

Dunlap Band of Mono Indians
Attn: Benjamin Charley Jr.
P.O. Box 14
Dunlap, CA 93621

Santa Rosa Rancheria Tachi Yokut Tribe
Attn: Leo Sisco
P.O. Box 8
Lemoore, CA 93245

Dunlap Band of Mono Indians
Attn: Dirk Charley
5509 E. McKenzie Avenue
Fresno, CA 93727

Tubatulabals of Kern Valley
Attn: Robert L. Gomez, Jr.
P.O. Box 226
Lake Isabella, CA 93240

Kern Valley Indian Community –
Kawaiisu Tubatulabal
Attn: Robert Robinson
P.O. Box 1010
Lake Isabella, CA 93240

Kern Valley Indian Community –
Kawaiisu Tubatulabal
Attn: Julie Turner
P.O. Box 1010
Lake Isabella, CA 93240

Wuksache Indian Tribe/Eshom Valley Band
Attn: Kenneth Woodrow
1179 Rock Haven Court
Salinas, CA 93906

Tule River Indian Tribe
Attn: Neil Peyron
P.O. Box 589
Porterville, CA 93258

APPENDIX B

Reclamation Plan
(Sespe Consulting, Inc., 2023)

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SESPE CONSULTING, INC.
A Trinity Consultants Company

374 Poli Street, Suite 200 • Ventura, California 93001

RECLAMATION PLAN
MCKAY POINT RESERVOIR PROJECT

Tulare Irrigation District
Tulare County, California

CA Mine ID No. – TBD

July 2023

For Submittal to:
Tulare County
Resource Management Agency
5961 South Mooney Boulevard
Visalia, California 93277
(559) 624-7000

Prepared by:
Sespe Consulting, Inc.
374 Poli Street, Suite 200
Ventura, California 93001
(805) 275-1515

Prepared for:
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274
(559) 686-3425

RECLAMATION PLAN
MCKAY POINT RESERVOIR

Tulare Irrigation District
Tulare County, California

CA Mine ID No. – TBD

July 2023

This Reclamation Plan was prepared by Sespe Consulting, Inc. on behalf and under the direction of the Tulare Irrigation District, the Consolidated Peoples Ditch Company, and Visalia and Kaweah Water Company (collectively the property "Owners"), as well as the operator West Coast Aggregate Supply, Inc.

RECLAMATION PLAN

Tulare Irrigation District – McKay Point Reservoir
Tulare County, California
CA Mine ID No. – TBD

July 2023

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RECLAMATION PLAN

Tulare Irrigation District – McKay Point Reservoir
Tulare County, California
CA Mine ID No. – TBD

July 2023

1.0 INTRODUCTION

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC), referred to herein as the "Owners", own approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County ("County"), California, commonly referred to as the McKay Point property. Together, the Owners are the holders of pre-1914 and post-1919 appropriative water rights on the Kaweah and the St. Johns Rivers.

The Owners propose to develop approximately 130 acres within the 200-acre McKay Point property into a surface water storage and re-regulation reservoir, referred to herein as the McKay Point Reservoir. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River. The reservoir would allow for better management of surface water by providing approximately 4,600 acre-feet of water storage capacity to support water demands during dry seasons, additional flood control, and storm water management during the wet season. Please see Figure 1 which shows the location of the McKay Point site.

In order to develop the reservoir, the site must be excavated to a sufficient depth and surface area that meets the Owner's water storage capacity requirements. Specifically, the excavated area would result in an open pit with a surface area of approximately 115 acres and a depth of approximately 60- to 75-feet below ground surface (bgs). The Owners would contract with West Coast Aggregate Supply, Inc. (WCA) to excavate the site. WCA would excavate and process material onsite into marketable products (primarily construction-grade aggregate). The Owners would receive revenue from WCA's sale of the excavated material, which would be used to offset the eventual construction and operational costs of the reservoir. Once excavation operations are complete, the McKay Point site would be reclaimed to a condition readily adaptable for future use as a water storage reservoir.

The Surface Mining and Reclamation Act (SMARA) of 1975 provides a comprehensive set of regulations for surface mining operations in California to ensure that adverse environmental and safety impacts are minimized and that mined lands are reclaimed to a usable and safe condition. The requirements of SMARA apply to any entity engaged in "any surface mining operations in California" which disturb more than one (1) acre or removes more than 1,000 cubic yards of material. Excavation of the McKay Point site would disturb approximately 115 acres and would excavate approximately 16.5 million tons (gross) of

material total. Therefore, the County has determined that the excavation of the reservoir basin and post-excavation site reclamation/stabilization activities are subject to SMARA. As such, the mining operator, WCA, is required to obtain the County's approval of a Surface Mining Permit and Reclamation Plan, and a Financial Assurance Cost Estimate (FACE). This Reclamation Plan has been prepared to address the SMARA requirements associated with the excavation and reclamation activities on the McKay Point site. This Reclamation Plan is being submitted to the County as part of the "Surface Mining Permit and Reclamation Plan" application package. The County is the "lead agency" for SMARA approvals and compliance, while TID is the lead agency for California Environmental Quality Act (CEQA) evaluation.

The McKay Point site lies within the Kaweah River Mineral Resource Zone (MRZ), which is included in the 1997 Mineral Land Classification of Concrete Aggregate Resources in the Tulare County Production-Consumption Region, California (Department of Conservation, 1997). The Project site and adjacent areas are classified as MRZ-2a and MRZ-2b, and are designated as having concrete-grade aggregate deposits of regional significance. The mineral resource classification and designation of MRZ areas is incorporated into the Environmental Resource Management Element of the County's 2030 General Plan (Tulare County, 2012).

This Reclamation Plan was prepared in compliance with the following:

- California Surface Mining and Reclamation Act of 1975 (SMARA), as amended (Public Resources Code, Section 2710 et. seq.) (Department of Conservation);
- California Code of Regulations (Title 14, Division 2, Chapter 8, Subchapter 1, Section 3500 et seq.);
- Tulare County Ordinance Code, Part VII, Chapter 25 – Surface Mining and Reclamation (Tulare County);
- Tulare County General Plan 2030 Update (Tulare County, 2012); and
- Tulare County – Surface Mining Permits and Reclamation Plan Application/Requirements.

1.1 Site Location

The McKay Point site is located unincorporated Tulare County, near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. As discussed above, the McKay Point Reservoir excavation site is located on the north side of the divergence of the Lower Kaweah River and St. Johns River (refer to Figure 1 and Figure 2). The site is located in a portion of Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Baseline and Meridian. It is depicted on the United States Geological Survey (USGS) Woodlake, California (2018) 7.5-minute topographic quadrangle. The approximate site coordinates are at latitude 36.39° N and longitude 119.04° W.

Surrounding land uses near the McKay Point site include existing and/or historical mining operations, agricultural land, rural residences and open space. The Lower Kaweah River and St. Johns River run east to west along the southern boundary of the site. Figure 1 and Figure 2 shows the site location and adjacent land uses.

The existing McKay Point site is currently undeveloped open space. Historically, the Project site has been used for cattle grazing under lease arrangements. There are no developed uses or buildings on the site. Most of the site is vegetated with non-native grasses except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by a mixed oak-riparian woodland. The site is drained by the Kaweah River, which drains to the ephemeral Tulare Lake in the southern end of the San Joaquin Valley, and by the St. Johns River, which becomes Cross Creek, before draining into the Tulare

Lake bottom near Corcoran. Figure 2 shows an aerial of the existing McKay Point site and the regional environmental setting.

The identified end use of the reclaimed McKay Point site is an excavated pit and ancillary features (e.g., perimeter road) that is suitable and adaptable for future construction of a water storage and re-regulation reservoir (i.e., McKay Point Reservoir). The final reclaimed pit with stable slopes would not include large above-grade structures or landforms. Please see Figure 1 through Figure 4 which depicts the property and reclamation boundaries of the McKay Point site. Table 1 below summarizes general land use information for the McKay Point site.

Table 1: Site Information

General Plan/Community Plan & Zoning Designation(s)	**General Plan:** Valley Agricultural (VA) **Zoning:** Exclusive Agricultural Zone – 20 Acre Minimum (AE-20)
Site Size	**Property Boundary:** Approximately 200 acres **Reclamation Boundary:** Approximately 130 acres **Limits of Excavation:** Approximately 115 acres
Current Use & Development	Undeveloped Grazing Land/Open Space
Adjacent County Land Use Designations	**North:** Exclusive Agricultural Zone – 20 Acre Minimum (AE-20) **South:** Exclusive Agricultural Zone – 40 Acre Minimum (AE-40) **East:** Exclusive Agricultural Zone – 40 Acre Minimum (AE-40) Exclusive Agricultural Zone – 20 Acre Minimum (AE-20) **West:** Exclusive Agricultural Zone – 20 Acre Minimum (AE-20)
Access	Vehicular access to the McKay Point site would use the existing access road located on the Seaborn site, which is adjacent to the western boundary of the McKay Point site. This point would serve as the single ingress and egress point for haul trucks, employees and other work vehicles. See Figure 2 for the McKay Point site plan.

Public Services / Utilities	– Material generated during reservoir excavation would be processed onsite using a processing wash/screen plant, and intermittently using a portable crush/recycle plant. Other than connecting the processing plant to the existing electrical infrastructure located on the north boundary of the site, no major changes to the current utility or public services systems are required at the McKay Point site. The portable crush/recycle plant would be powered by a diesel generator. – Water would be provided by a groundwater well to be constructed on the northern portion of the site (see Figure 3). Approximately 1,500 gallons per minute of water would be used onsite for materials processing and fugitive dust control during reservoir excavation. – The site would operate with portable sanitation facilities, which would be brought onsite once operations commence. – Electrical service would be provided by Southern California Edison (SCE) from existing power lines located along the north boundary of the site (see Figure 3). Other than connecting to these existing powerlines, no additional electrical infrastructure or power lines would be necessary. – No natural gas or propane would be utilized at the site. – No fixed landline telephone service is required. Employees would continue to utilize cellular phones around the site. – Trash would be collected onsite and disposed of by USA Waste (Waste Management).

1.2 Background & Permit History

1.2.1 McKay Point Site

As discussed above, historically the McKay Point site has been used for cattle grazing under lease arrangements. Biological resources in the region have historically been modified by past and present land uses. Prior to human settlement, this region was dominated by riparian vegetation within the floodplains, with stands of valley oak and interior live oak on higher ground. Cattle grazing and deforestation of the oaks in the early- to mid-1800s for agriculture substantially altered both the floodplain and channel vegetation. Much of the native vegetation in the area has been replaced by introduced species or has been eliminated by cultivation and overgrazing.

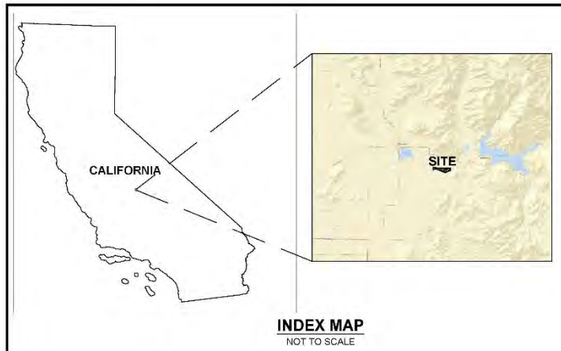
The existing McKay Point site is relatively flat and undeveloped, with no existing buildings or notable features. The property has no existing land use permits or entitlements. Please see Figure 1 which shows the extent of the Owners holdings in relation to the McKay Point site.

1.2.2 Seaborn Site

The Seaborn site is located adjacent to the west boundary of the McKay Point site and has been used for the excavation and processing of aggregate since 1948. The first use permit for the Seaborn site was issued by the County in 1958. Subsequent expansions to the mine site were approved in 1963 (M-2 UP#63-21) and in 1966 (M-2 UP#66-11). Following the adoption of SMARA, a Surface Mining Reclamation Plan (PMR 79-04) was approved for the Seaborn site in 1980. The 1980 Reclamation Plan described the reclaimed end use of the property as a lake with stable slopes and vegetation along the banks. In 2001, an amendment to the approved Reclamation Plan was granted by the County authorizing the use of an

additional 20 acres to the north of the Seaborn site for the storage of processed aggregate, rock crusher parts and heavy equipment storage. The 2001 amendment modified PMR 79-04 to address the 20-acre stockpile area and described final reclamation of the 20-acre area as the removal of all equipment and product stockpiles, followed by a return to its pre-site disturbance use as irrigated pasture.

The Owners purchased the Seaborn site to provide access to the McKay Point site. During excavation and reclamation activities at the McKay Point site, the Seaborn site would be used primarily for ingress and egress for haul trucks, work and delivery vehicles and employee vehicles via the existing access road which connects to Road 222. The extraction and processing of aggregate at the McKay Point site has been designed not to exceed the average and maximum production rates achieved at the Seaborn site operations. Section 1.3 provides more detail regarding the estimated material quantities, and excavation and processing rates.



INDEX MAP
NOT TO SCALE

SHEET INDEX

FIGURE 1:	SITE OVERVIEW
FIGURE 2:	MINING PLAN
FIGURE 3:	RECLAMATION PLAN
FIGURE 4:	CROSS SECTIONS

LEGEND:

- PROPERTY BOUNDARY
- PROPERTY LINES
- EXISTING TOPOGRAPHY
- RECLAMATION PLAN BOUNDARY
- LIMIT OF MINING
- PERIMETER FENCE
- SLURRY WALL
- INFILTRATION TRENCH
- PERIMETER ROAD

GEOLOGIC DESCRIPTION

GEOLOGIC SETTING

THE MCKAY POINT SITE IS LOCATED IN CALIFORNIA'S CENTRAL VALLEY, NEAR THE WESTERN BOUNDARY IN THE LOW FOOTHILLS OF THE SIERRA NEVADA GEOMORPHIC PROVINCE OF CALIFORNIA. THE SOUTHERN SAN JOAQUIN VALLEY BOUNDS THIS PART OF THE SIERRA NEVADA TO THE WEST AND THE GREAT BASIN TO THE EAST. THE FOLLOWING EXCERPTS FROM THE GEOLOGY AND SOILS TECHNICAL STUDY (SLR CONSULTING, DECEMBER 2021) PROVIDE A BRIEF SUMMARY OF THE REGIONAL AND SITE GEOLOGIC SETTING. SEE ALSO SECTION 3.1 OF THE RECLAMATION PLAN AND THE COMPLETE SLR CONSULTING REPORT IN RECLAMATION PLAN APPENDIX A.

REGIONAL GEOLOGY

THE MCKAY POINT SITE IS LOCATED IN THE SAN JOAQUIN VALLEY, WHICH IS THE SOUTHERN PORTION OF THE CENTRAL VALLEY OF CALIFORNIA. THE CENTRAL VALLEY FORMED BY MILLIONS OF YEARS OF DEPOSITION OF QUATERNARY SEDIMENTS DERIVED FROM THE UPLIFTED SIERRA NEVADA AND COAST RANGES, WHICH BOUND THE CENTRAL VALLEY ON ITS EAST AND WEST. THE CENTRAL VALLEY IS AN ALLUVIAL PLAIN APPROXIMATELY 50 MILES WIDE AND 400 MILES LONG (NORTH TO SOUTH). SEDIMENTS HAVE BEEN DEPOSITED INTO THE CENTRAL VALLEY FOR THE LAST 160 MILLION YEARS, AND CAN BE THOUSANDS OF FEET THICK IN CERTAIN AREAS.

NUMEROUS RIVERS AND STREAMS ORIGINATING IN THE HIGHER ELEVATIONS OF THE SIERRA NEVADA, INCLUDING THE KAWEAH RIVER, FLOW WESTWARD INTO THE CENTRAL VALLEY, DEPOSITING QUATERNARY ALLUVIAL SEDIMENTS UPON WHICH THE SITE IS LOCATED. THIS ALLUVIUM IS UNDERLAIN BY A SEQUENCE OF MARINE AND CONTINENTAL SEDIMENTARY ROCKS CONSISTING OF SHALE, SILTSTONE, SANDSTONE, AND LOCALLY GRANITIC ROCK UNDERLYING THE ALLUVIUM AT THE SITE. BENEATH THESE ROCKS LIES AN IMPERMEABLE BASEMENT COMPLEX OF IGNEOUS AND METAMORPHIC ROCKS THAT EXTEND AS DEEP AS 13,000-FEET BELOW GROUND SURFACE (BGS). THESE BASEMENT ROCKS ARE A SUBSURFACE EXTENSION OF THE SAME ROCKS THAT OCCUR IN THE SIERRA NEVADA.

SITE GEOLOGY

THE MCKAY POINT SITE IS AT AN ELEVATION OF APPROXIMATELY 460- TO 470-FEET ABOVE MEAN SEAL LEVEL (AMSL) AND IS LOCATED IN THE EASTERN PORTION OF KAWEAH SUB-BASIN OF THE SAN JOAQUIN VALLEY GROUNDWATER BASIN. THIS AREA IS UNDERLAIN BY YOUNG UNCONSOLIDATED ALLUVIAL DEPOSITS (SANDS AND GRAVELS) FROM THE NEARBY SIERRA-NEVADA MOUNTAINS. THESE MODERATELY TO HIGHLY PERMEABLE SANDS AND GRAVELS EXTEND TO DEPTHS OF SEVERAL HUNDRED FEET OR MORE. THE SITE VICINITY IS DRAINED BY THE KAWEAH RIVER AND ST. JOHNS RIVERS, WHICH DEPOSITED THESE SEDIMENTS.

THE SURFACE SOIL AT THE MCKAY POINT SITE PRIMARILY CONSISTS OF LOOSE, MEDIUM" GRAINED SAND WITH OCCASIONAL GRAVEL AND COBBLES. THE THICKNESS OF FLUVIAL SEDIMENTS AT THE SITE RANGES BETWEEN APPROXIMATELY 40- AND 100-FEET BGS. ALLUVIAL DEPOSITS AT THE MCKAY POINT SITE CONSIST OF SAND THAT IS ABOUT 15- TO 20-FEET THICK. COBBLES, BOULDERS WITH SAND, CLAY AND SILT ARE COMMON BELOW THIS SAND INTERVAL. THESE DEPOSITS EXTENDED TO A DEPTH OF ABOUT 40-FEET BGS ON THE EASTERN PORTION OF THE SITE, AND TO ABOUT 100-FEET BGS ON THE WESTERN. THE BEDROCK ENCOUNTERED IS LIKELY MESOZOIC GRANITIC ROCKS OF THE SIERRA-NEVADA BATHOLITH, WHICH HAS BEEN MAPPED AS OUTCROPS AT HIGHER ELEVATIONS WITHIN ABOUT A MILE TO THE NORTH, EAST, AND SOUTH OF SITE. THE SURROUNDING HILL AND OUTCROP FEATURES SUGGEST BEDROCK COULD GET DEEPER TO THE WEST AND SOUTHWEST, TOWARDS THE VALLEY. AVAILABLE BORINGS ENCOUNTERED BEDROCK IN THE EASTERLY PORTION OF THE SITE AT APPROXIMATELY 77-FEET BGS. IN THE WESTERLY PORTION OF THE SITE, BEDROCK WAS NOT ENCOUNTERED WITHIN THE EXPLORED DEPTHS OF ABOUT 90-FEET BGS, INDICATING IT WOULD BE DEEPER THAN THAT.

WEATHERED OR DECOMPOSED BEDROCK ZONES AND SOME DISCONTINUOUS INTRUSIONS OF CLAY OR CLAYEY SAND MAY ALSO EXIST. THERE IS AN APPROXIMATE 10- TO 15-FOOT-THICK MANTLE OF VERY DENSE SILTY, CLAYEY SAND OVERLYING THE BEDROCK. THIS LAYER GENERALLY FOLLOWS THE TOP OF ROCK, LIKEWISE DIPPING DOWN TO THE WEST. BOTH THE BEDROCK AND THE OVERLYING MANTLE OF VERY DENSE SOILS ARE EXPECTED TO BE LESS PERVIOUS THAN THE OVERLYING ALLUVIAL MATERIALS AND THEREFORE PROVIDE A GOOD OPPORTUNITY TO KEY-IN A SLURRY WALL TO ACHIEVE THE DESIRED HYDRAULIC BARRIER.



TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

MINERAL COMMODITY:	SAND AND GRAVEL
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SOURCE DATA:

PROPERTY LINES:	PROVOST & PRITCHARD CONSULTING GROUP; TIMOTHY ODOM, CA PLS 8468
AERIAL PHOTOGRAPH:	GOOGLE EARTH IMAGERY, DATE 02/08/2018
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
CONTOUR INTERVAL:	2 FEET
DATUM:	HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88

THIS DRAWING HAS BEEN PREPARED IN ACCORDANCE WITH A STANDARD OF CARE ORDINARY AND CUSTOMARY WITHIN THE PRACTICE OF ENGINEERING. THE SCOPE OF RESPONSIBILITY OF THE UNDERSIGNED IS LIMITED SPECIFICALLY TO THE AREA OF PRACTICE OF CIVIL ENGINEERING DEFINED IN THE CALIFORNIA PROFESSIONAL ENGINEERS ACT.

REGISTERED PROFESSIONAL ENGINEER — No. C87466 — CIVIL — STATE OF CALIFORNIA

A. PEARCE SWERDFEGER R.C.E. 87466 EXP 09-30-2023

THE SCOPE OF THE PROPERTY BOUNDARY INFORMATION SHOWN ON THIS PLAN IS BASED UPON RECORD INFORMATION TIED TO PHYSICAL MONUMENTS AND WAS PREPARED UNDER THE DIRECTION OF TIMOTHY M. ODOM, PLS 8468.

PROFESSIONAL LAND SURVEYOR — TIMOTHY M. ODOM — No. 8468 — STATE OF CALIFORNIA

TIMOTHY M. ODOM P.L.S. 8468 EXP. 12-31-2024

200 0 200 400
SCALE IN FEET
SCALE: 1" = 200'
SCALE INDICATED IS BASED ON A 24" X 36" FORMAT PRINT

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REVISIONS

MARK	DATE	DESCRIPTION	BY
	09/15/23	INITIAL DRAFT	CJC

REVIEWED BY: DATE
DATE

TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
SITE OVERVIEW

SCALE: HORIZ. AS SHOWN
VERT. AS SHOWN
DRAWN BY: C. CAMUS
CHECKED BY: APS

FIGURE 1

Plot Date: C:\Users\Pearce.Swerdfeger\Trinity Consultants, Inc\Tulare Irrigation – Documents\CA Tulare County\08 Reclamation Plan\CAD\TID-McKayPt-RecPlan2023-v2.0.dwg Jun 15, 2023, 9:46am Pearce.Swerdfeger

1.3 Summary of Mining & Reclamation Activities

This Reclamation Plan has been prepared because the excavation of the pit for the construction of the McKay Point Reservoir is considered a surface mining operation and is therefore subject to SMARA. The end use of the mining pit is the preparation and stabilization of the pit such that it would be adaptable for use as a water storage reservoir. Section 4.0 provides more details on the reservoir excavation/mining operation, and Section 5.0 provides specifics related to post-mining reclamation.

The site must be excavated to a depth and surface area that meets the necessary water storage capacity requirements for the reservoir. WCA would begin the excavation in the western portion of the McKay site and progress eastward. As with most mine sites, development staging may vary based on operational factors encountered during mining. Ultimately, the excavated area would result in an open pit with a surface area of approximately 115 acres and a final depth of approximately 60- to 75-feet bgs (anticipated depth to bedrock). Final slopes are anticipated to be approximately 3H:1V (horizontal:vertical) in order to minimize any bank erosion from the wind and water. A slurry wall would also be constructed early in the excavation process around the entire perimeter of the excavation area to minimize groundwater seepage into the pit; therefore, allowing for dry mining operations. See Figure 2 which shows the design for the excavation pit.

The mining operations would be typical of surface aggregate mining operations and mining would involve the use of mobile equipment to excavate material and processing plants to process, wash and crush (if necessary) the material into marketable sand and gravel (i.e., aggregate). Excavated material would be transferred to the processing plants by haul truck. Once processed, material would be loaded into haul trucks at an onsite loading area and delivered to WCA customers or to WCA's other permitted facilities throughout the region as needed. Haul trucks would enter and exit the McKay Point site through the existing access road located on the Seaborn site (see Figure 3). Concrete may also be brought to the site for recycling using the portable crush/recycle plant. Depending upon customers required specifications, additives may also be brought onsite and added to the excavated materials during processing. Blasting would not be required to conduct the mining operations. Figure 2 through Figure 4 show the mine plan, reclamation plan and the cross-sections.

It is estimated that a total of 16.5 million (gross) tons of material and 11.5 million (net) tons of marketable material would be excavated to create the final pit. Approximately 920,000 gross tons of material would be excavated from the pit per year, depending on market demand. The gross volume calculations are based on the excavation of approximately 115 acres to a depth of approximately 60- to 75-feet bgs. It is estimated that 30% of the material extracted would be waste rock, therefore approximately 650,000 net tons per year of marketable quality aggregate is expected to be produced onsite. WCA would manage the excavation and processing of the aggregate such that the average and maximum annual production of marketable products sent offsite would not exceed the production rates previously achieved at the adjacent Seaborn site. Specifically, the average annual production rates of approximately 500,000 tons per year and the maximum annual production rate of 650,000 tons per year would not be exceeded.

Excavation is estimated to commence in 2024, and continue for up to 20-years (estimate final reclamation/site stabilization commence in 2044) depending on market demand. WCA's operations would provide a high-quality source of local aggregate materials to serve the regional market.

The major components of the excavation and reclamation activities include the following (see Figure 2 through Figure 4):

- Open-pit surface mining;
- Processing – screening, washing, and crushing (if necessary) of material;
- Import and recycling of imported concrete;
- Temporary stockpiles of excavated and processed materials;
- Ancillary mining equipment and processes;
- Construction of an onsite well;
- Installation of a perimeter slurry wall to minimize groundwater seepage into the excavation pit and allow for dry mining;
- Addition of additives to excavated materials as needed to meet customers specifications;
- Material loadout into haul trucks;
- Construction of infiltration galleries, if necessary;
- Use of additives to excavated materials to meet customer specifications;
- Various site improvements for access, safety, and other requirements;
- Reclamation of the site adaptable for use as a reservoir;
- Import of material for recycling; and
- Backfilling of excavation to bring side slopes from 1H:1V to 3H:1V as needed for the end use (reservoir).



INDEX MAP
NOT TO SCALE

SHEET INDEX

FIGURE 1:	SITE OVERVIEW
FIGURE 2:	**MINING PLAN**
FIGURE 3:	RECLAMATION PLAN
FIGURE 4:	CROSS SECTIONS

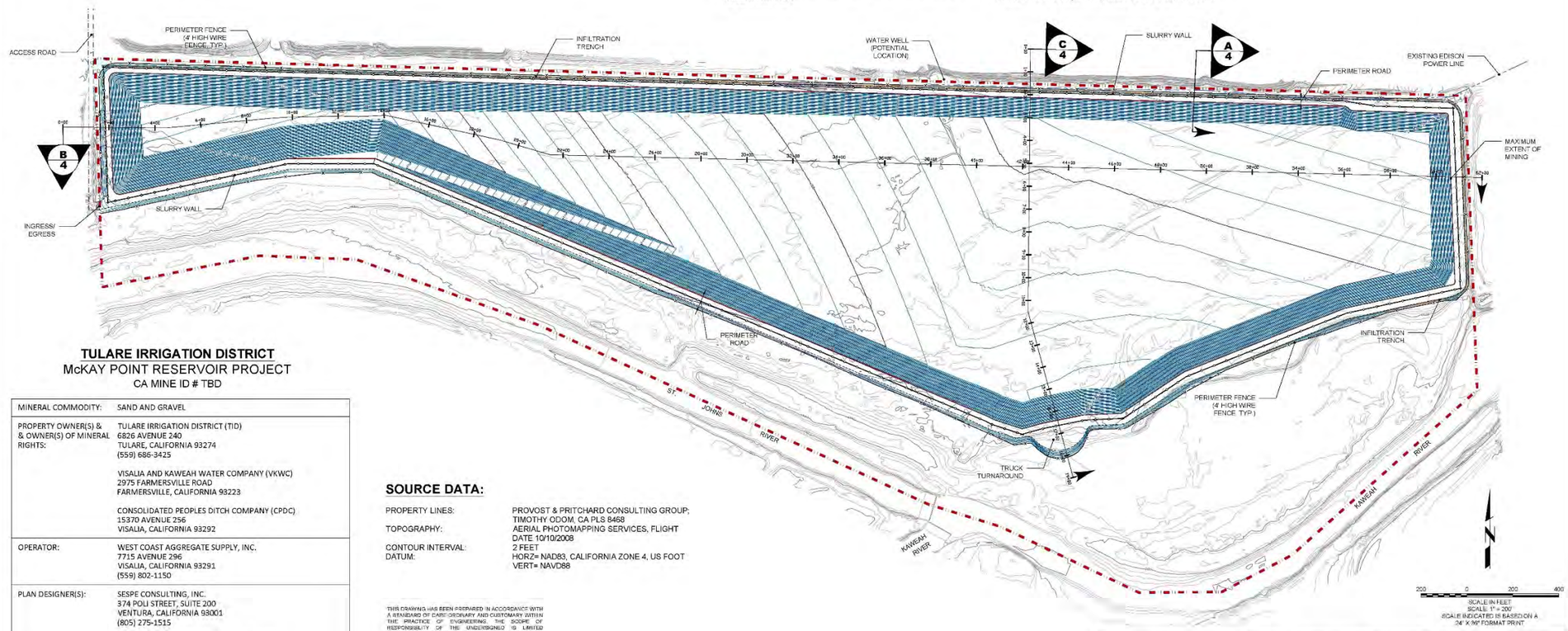
LEGEND:

- PROPERTY BOUNDARY
- EXISTING TOPOGRAPHY
- MAXIMUM PIT MINING CONTOURS
- LIMIT OF MINING
- PERIMETER FENCE
- SLURRY WALL
- INFILTRATION TRENCH
- PERIMETER ROAD

MINING NOTES

1. THE MAXIMUM EXCAVATED PIT WILL HAVE A DEPTH OF 60 TO 90 FEET BELOW THE EXISTING GROUND SURFACE. PIT SLOPES WILL NOT EXCEED 1.5H:1V (HORIZONTAL TO VERTICAL).
2. DURING THE INITIAL LIMITED EXCAVATION AND MATERIAL PROCESSING STAGE, AN IMPERMEABLE SLURRY WALL WILL BE CONSTRUCTED AROUND THE EXACTION AREA TO LIMIT THE AMOUNT OF GROUNDWATER FLOW INTO THE EXCAVATION AS FUTURE EXCAVATION PROGRESSES BELOW THE WATER TABLE. THE SLURRY WALL WILL BE DESIGNED BY A QUALIFIED PROFESSIONAL AND CONSTRUCTED BY A QUALIFIED CONTRACTOR WITH EXPERIENCE IN INSTALLING SIMILAR FACILITIES. CONSTRUCTION WILL INCLUDE THE FOLLOWING FACILITIES:
   - A PERIMETER ACCESS ROAD THAT WOULD ALSO SERVE AS A LEVELING SURFACE FOR THE CONSTRUCTION OF THE SLURRY WALL. THE ROAD MAY VARY IN WIDTH FROM APPROXIMATELY 30 TO 50 FEET AND WILL BE BUILT ON FILL UP TO 8 FEET IN HEIGHT.
   - AN APPROXIMATELY 60- TO 90-FOOT-DEEP SLURRY WALL SURROUNDING THE EXCAVATION AREA. ITS ACTUAL DEPTH WILL BE DETERMINED DURING DESIGN AND VERIFIED DURING CONSTRUCTION BASED ON SUBSURFACE INFORMATION, TO PROVIDE THE REQUIRED REDUCTION IN GROUNDWATER INFLOW. THE SLURRY WALL WOULD BE CONSTRUCTED THROUGH THE PERIMETER ROAD AND CAPPED OFF WITH A DURABLE GRAVEL LAYER.
   - AN APPROXIMATELY 5-FOOT-DEEP WATER INFILTRATION TRENCH ALONG THE NORTHERN BORDER OF THE ULTIMATE RESERVOIR AREA.
3. THE OVERBURDEN AND EXCESS FINES RESULTING FROM THE EXCAVATION OF THE PIT AND PROCESSING OF MATERIALS WOULD BE PRIMARILY USED ONSITE TO CONSTRUCTED THE SERVICE ROAD AROUND THE PERIMETER OF THE PIT OR AS BACKFILL AGAINST THE PIT WALLS TO ACHIEVE DESIRED 3H:1V (HORIZONTAL:VERTICAL) FINAL SLOPES. ADDITIONALLY, OVERBURDEN MAY ALSO BE STORED IN VARIOUS TEMPORARY STOCKPILES LOCATED THROUGHOUT THE SITE OR AT THE BOTTOM OF THE EXCAVATION PIT AS NEEDED. NOTE THAT TOPSOIL AND SUBSOIL STORAGE IS NOT A REQUIRED ELEMENT OF THE MINE PLAN.
4. MINING SETBACKS WILL BE 30 FEET FROM THE EXTERIOR PROPERTY BOUNDARIES, 50 FEET FROM THE BANKS OF THE ADJACENT WATER BODIES, AND 50 FEET FROM THE OAK-RIPERIAN WOODLAND ON THE SOUTHEASTERN PORTION OF THE PROPERTY.
5. THE OPERATOR WILL COMPLY WITH THE CONCLUSIONS AND RECOMMENDATIONS PRESENTED BY SLR IN THE *GEOLOGY AND SOILS TECHNICAL STUDY FOR THE MCKAY POINT RESERVOIR PROJECT* (REPORT DATE: DECEMBER 2021).
6. BEST MANAGEMENT PRACTICES (BMPs) TO PREVENT EROSION, SEDIMENT, AND WINDBLOWN DUST WILL BE IMPLEMENTED AS DESCRIBED IN THE SITE-SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP). DUST WILL BE CONTROLLED THROUGHOUT THE SITE/ON UNPAVED ROADS USING A MOBILE WATER TRUCK.
7. THERE ARE NO EXISTING PUBLIC ROADS, RAILROADS, OR WATER WELLS WITHIN 500-FEET OF THE SITE. ACCESS TO THE PROJECT SITE WILL BE THROUGH THE ADJACENT SEABORN SITE TO THE WEST, WHICH CONNECTS TO ROAD 222.
8. EXISTING SOUTHERN CALIFORNIA EDISON (SCE) POWER LINES RUN ALONG THE NORTHERN PERIMETER OF THE SITE. THE PROPOSED WASH/SCREEN PLANT WILL CONNECT TO THESE EXISTING UTILITIES. NO OTHER UTILITIES (GAS TELEPHONE, WATER, ETC.) EXISTING WITHIN 500 FEET OF THE SITE.

CONCEPTUAL LOCATIONS OF THESE DESIGN ELEMENTS ARE SHOWN ON THE FIGURE BELOW, AND PROPOSED CONCEPTUAL DESIGN LAYOUTS ARE DEPICTED ON SECTION A ON FIGURE 4.



TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

MINERAL COMMODITY:	SAND AND GRAVEL
PROPERTY OWNER(S) & & OWNER(S) OF MINERAL RIGHTS:	TULARE IRRIGATION DISTRICT (TID) 6826 AVENUE 240 TULARE, CALIFORNIA 93274 (559) 686-3425 VISALIA AND KAWEAH WATER COMPANY (VKWC) 2975 FARMERSVILLE ROAD FARMERSVILLE, CALIFORNIA 93223 CONSOLIDATED PEOPLES DITCH COMPANY (CPDC) 15370 AVENUE 256 VISALIA, CALIFORNIA 93292
OPERATOR:	WEST COAST AGGREGATE SUPPLY, INC. 7715 AVENUE 296 VISALIA, CALIFORNIA 93291 (559) 802-1150
PLAN DESIGNER(S):	SESPE CONSULTING, INC. 374 POLI STREET, SUITE 200 VENTURA, CALIFORNIA 93001 (805) 275-1515 PROVOST & PRITCHARD CONSULTING GROUP 130 NORTH GARDEN STREET VISALIA, CALIFORNIA 93291 (559) 636-1166
LEAD AGENCY:	TULARE COUNTY RESOURCE MANAGEMENT AGENCY 5961 SOUTH MOONEY BOULEVARD VISALIA, CALIFORNIA 93277 (559) 624-7000

SOURCE DATA:

PROPERTY LINES:	PROVOST & PRITCHARD CONSULTING GROUP; TIMOTHY ODOM, CA PLS 8468
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
CONTOUR INTERVAL:	2 FEET
DATUM:	HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88

THIS DRAWING HAS BEEN PREPARED IN ACCORDANCE WITH A STANDARD OF CARE ORDINARY AND CUSTOMARY WITHIN THE PRACTICE OF ENGINEERING. THE SCOPE OF RESPONSIBILITY OF THE UNDERSIGNED IS LIMITED SPECIFICALLY TO THE AREA OF PRACTICE OF CIVIL ENGINEERING DEFINED IN THE CALIFORNIA PROFESSIONAL ENGINEERS ACT.

REGISTERED PROFESSIONAL ENGINEER PEARCE SWERDFEGER NO. C07466 CIVIL STATE OF CALIFORNIA

A. PEARCE SWERDFEGER R.C.E. 87466 EXP. 09-30-2023

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374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

OWNER / APPLICANT
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TULARE, CALIFORNIA 93274
(559) 686-3425

LAND USE CONSULTANT
SESPE CONSULTING, INC.
374 POLI STREET, SUITE 200
VENTURA, CALIFORNIA 93001
(805) 275-1515

REVISIONS			
NO.	DATE	DESCRIPTION	BY

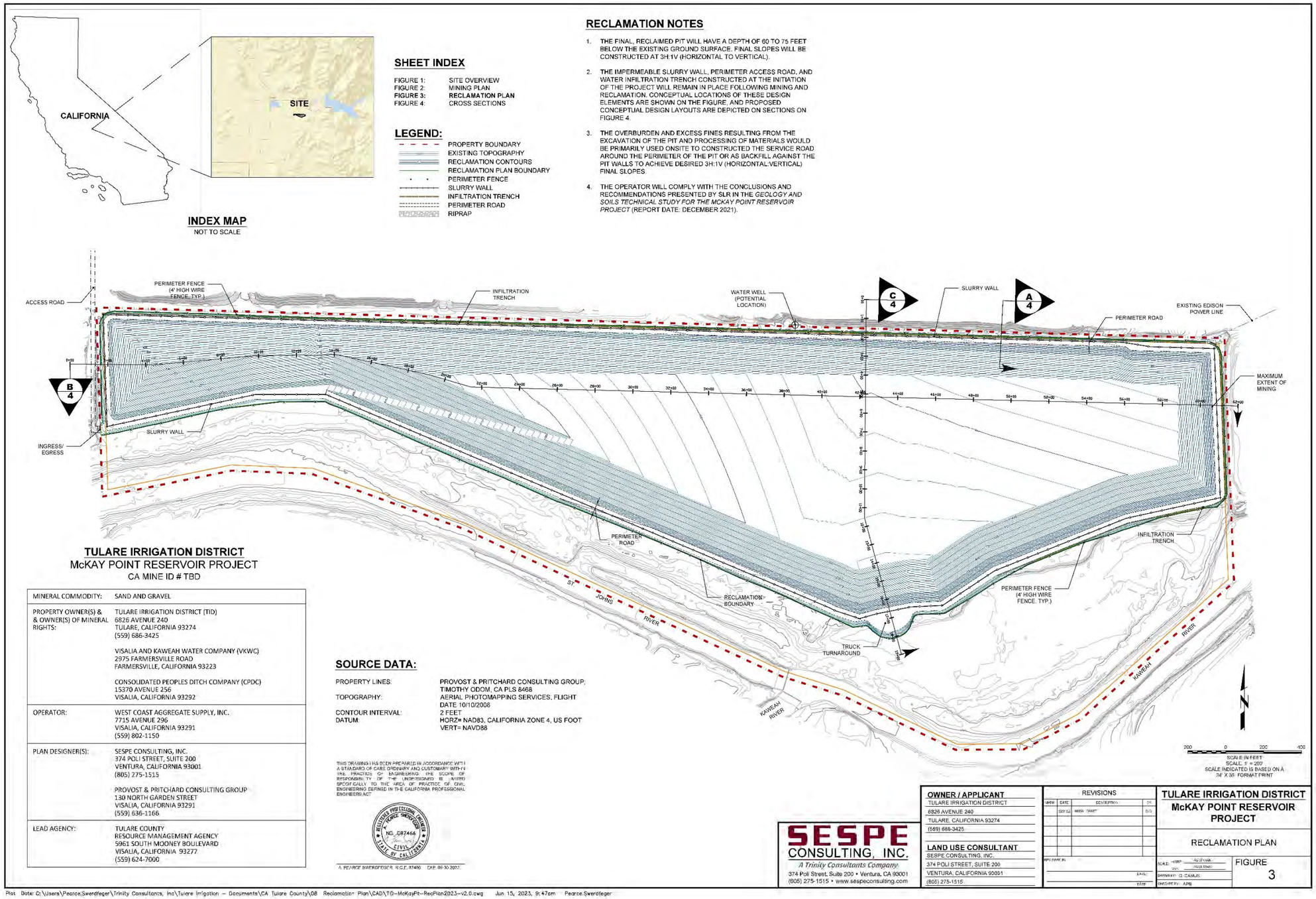
TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT

MINING PLAN

FIGURE 2

DESIGNED: Q. CRAVUS
DRAWN: APS

Plot Date: C:\Users\Pearce.Swerdfeger\Trinity Consultants, Inc\Tulare Irrigation - Documents\CA Tulare County\09 Reclamation Plan\CAD\TID-McKayPt-RecPlan2023-v2.0.dwg Jun 15, 2023, 9:47am Pearce.Swerdfeger


CALIFORNIA
SITE
INDEX MAP
NOT TO SCALE
SHEET INDEX
FIGURE 1: SITE OVERVIEW
FIGURE 2: MINING PLAN
FIGURE 3: RECLAMATION PLAN
FIGURE 4: CROSS SECTIONS
LEGEND:
PROPERTY BOUNDARY
EXISTING TOPOGRAPHY
RECLAMATION CONTOURS
RECLAMATION PLAN BOUNDARY
PERIMETER FENCE
SLURRY WALL
INFILTRATION TRENCH
PERIMETER ROAD
RIPRAP
RECLAMATION NOTES
1. THE FINAL, RECLAIMED PIT WILL HAVE A DEPTH OF 60 TO 75 FEET BELOW THE EXISTING GROUND SURFACE. FINAL SLOPES WILL BE CONSTRUCTED AT 3H:1V (HORIZONTAL TO VERTICAL).
2. THE IMPERMEABLE SLURRY WALL, PERIMETER ACCESS ROAD, AND WATER INFILTRATION TRENCH CONSTRUCTED AT THE INITIATION OF THE PROJECT WILL REMAIN IN PLACE FOLLOWING MINING AND RECLAMATION. CONCEPTUAL LOCATIONS OF THESE DESIGN ELEMENTS ARE SHOWN ON THE FIGURE, AND PROPOSED CONCEPTUAL DESIGN LAYOUTS ARE DEPICTED ON SECTIONS ON FIGURE 4.
3. THE OVERBURDEN AND EXCESS FINES RESULTING FROM THE EXCAVATION OF THE PIT AND PROCESSING OF MATERIALS WOULD BE PRIMARILY USED ONSITE TO CONSTRUCTED THE SERVICE ROAD AROUND THE PERIMETER OF THE PIT OR AS BACKFILL AGAINST THE PIT WALLS TO ACHIEVE DESIRED 3H:1V (HORIZONTAL:VERTICAL) FINAL SLOPES.
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ACCESS ROAD
PERIMETER FENCE (4' HIGH WIRE FENCE, TYP.)
INFILTRATION TRENCH
WATER WELL (POTENTIAL LOCATION)
SLURRY WALL
PERIMETER ROAD
EXISTING EDISON POWER LINE
MAXIMUM EXTENT OF MINING
INGRESS/ EGRESS
PERIMETER ROAD
RECLAMATION BOUNDARY
TRUCK TURNAROUND
ST. JOHNS RIVER
KAWEAH RIVER
N
SCALE IN FEET
SCALE: 1" = 200'
SCALE INDICATED IS BASED ON A 24" X 36" FORMAT PRINT
TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD
MINERAL COMMODITY: SAND AND GRAVEL
PROPERTY OWNER(S) & OWNER(S) OF MINERAL RIGHTS: TULARE IRRIGATION DISTRICT (TID) 6826 AVENUE 240 TULARE, CALIFORNIA 93274 (559) 686-3425
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SOURCE DATA:
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TOPOGRAPHY: AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
CONTOUR INTERVAL: 2 FEET
DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88
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REVISIONS
MARK DATE DESCRIPTION BY
APP'D BY:
DATE:
TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
RECLAMATION PLAN
SCALE: 1"=200'
DRAWN BY: CI - CAMUS
CHECKED BY: APS
FIGURE 3
Plot Date: C:\Users\Pearce.Swerdfeger\Trinity Consultants, Inc\Tulare Irrigation – Documents\CA Tulare County\08 Reclamation Plan\CAD\TID-McKayPt-RecPlan2023-v2.0.dwg Jun 15, 2023, 9:47am Pearce.Swerdfeger

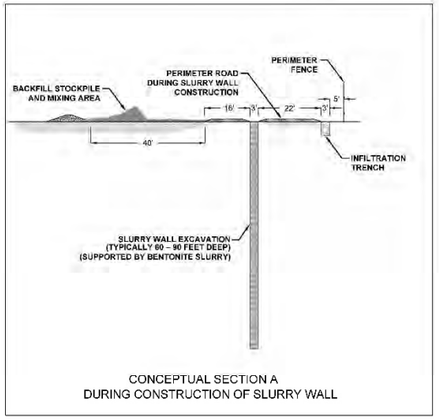
TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

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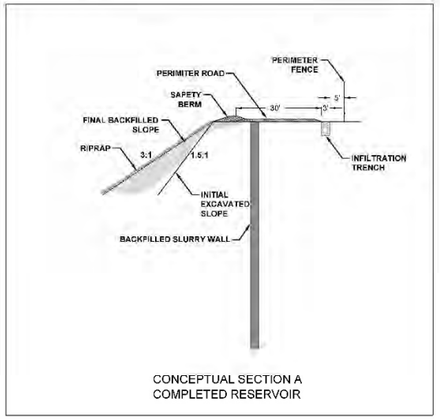
SHEET INDEX

FIGURE 1: SITE OVERVIEW
FIGURE 2: MINING PLAN
FIGURE 3: RECLAMATION PLAN
FIGURE 4: SECTIONS AND DETAILS

PROFILE VIEW OF SECTION A



CONCEPTUAL SECTION A
DURING CONSTRUCTION OF SLURRY WALL



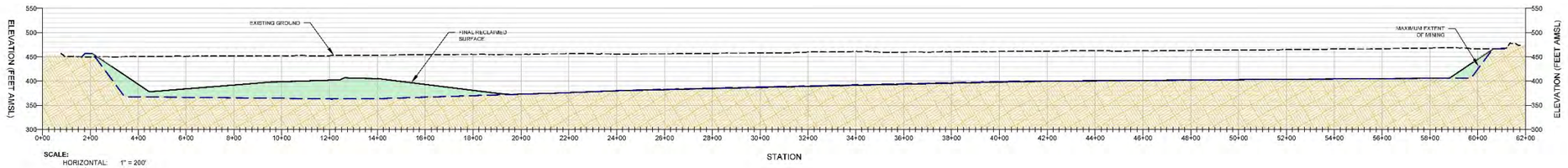
CONCEPTUAL SECTION A
COMPLETED RESERVOIR

SCALE: 1" = 20'

SCALE: 1" = 20'

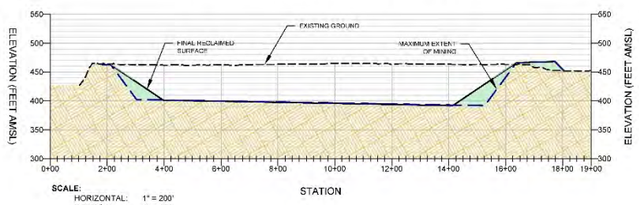
NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE AND FOR ILLUSTRATION PURPOSES ONLY

PROFILE VIEW OF SECTION B



SCALE:
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 100'

PROFILE VIEW OF SECTION C



SCALE:
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 100'

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REGISTERED PROFESSIONAL ENGINEER PEARCE SWERDFEGER NO. 087466 CIVIL STATE OF CALIFORNIA

A. PEARCE SWERDFEGER R.C.E. 87466 EXP. 09-30-2023

SOURCE DATA:

CONCEPTUAL SECTION A DESIGN:	ADAPTED FROM *MCKAY POINT RESERVOIR PROHECT GEOLOGY AND SOILS TECHNICAL STUDY*, SLR, DECEMBER 2021.
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
DATUM:	HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88

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REVISIONS

MARK	DATE	DESCRIPTION	BY
	06/15/23	ALL AS DRAFT	DAS

REVISED BY: DATE

TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT

SECTIONS AND DETAILS

SCALE: HORZ: AS SHOWN
VERT: AS SHOWN
DRAWN BY: G. CAMUS
CHECKED BY: APS

FIGURE 4

Plot Date: C:\Users\Pearce.Swerdfeger\Trinity Consultants, Inc\Tulare Irrigation – Documents\CA Tulare County\08 Reclamation Plan\CAD\TID-McKayPt-RecPlan2023-v2.0.dwg Jun 15, 2023, 9:47am Pearce.Swerdfeger

2.0 GENERAL OWNERSHIP / OPERATION INFORMATION

2.1 Mine Operator & Property Owner Information

MINE NAME: McKay Point Reservoir

CA MINE ID NUMBER: TBD

LOCATION OF MINE: The site has no physical address per the Tulare County Office of Assessor. The site is located approximately 1.0 mile east of Road 222/Avenue 335 in unincorporated Tulare County, CA 93286.

ASSESSOR PARCEL NUMBERS (APN): The McKay Point Reservoir lies on portions of multiple APNs shown in Table 2 below.

Table 2: APN's & Acreages

Parcel Number	Property Owner	Zoning Designation	Acreage
113-070-016-000 (portion)	Tulare Irrigation District P.O. Box 1920 Tulare, CA 93275-1920	Exclusive Agriculture Zone – 20 Acre Minimum (AE-20)	16.0
113-080-005-000	Tulare Irrigation District P.O. Box 1920 Tulare, CA 93275-1920	Exclusive Agriculture Zone – 20 Acre Minimum (AE-20)	65.0
113-080-008-000	Tulare Irrigation District P.O. Box 1920 Tulare, CA 93275-1920	Exclusive Agriculture Zone – 20 Acre Minimum (AE-20)	30.0
113-090-001-000	Tulare Irrigation District P.O. Box 1920 Tulare, CA 93275-1920	Exclusive Agriculture Zone – 20 Acre Minimum (AE-20)	64.0
113-100-002-000	Tulare Irrigation District P.O. Box 1920 Tulare, CA 93275-1920	Exclusive Agriculture Zone – 20 Acre Minimum (AE-20)	19.0
		Total Acres:	**194.0**

COUNTY USE PERMIT: Surface Mining Permit and Reclamation Plan (No. TBD)

MINE OPERATOR: West Coast Aggregate Supply, Inc.

OPERATOR TELEPHONE NUMBER: (559) 802-1150

OPERATOR MAILING ADDRESS: 7715 Avenue 296
Visalia, California 93291

OWNERS OF POSSESSORY INTEREST: Tulare Irrigation District
Consolidated Peoples Ditch Company
Visalia and Kaweah Water Company

LEGAL DESCRIPTION: Portions of Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Baseline and Meridian

2.2 Lead Agency Information

LEAD AGENCY: County of Tulare, Resource Management Agency (RMA)

STAFF CONTACT: Hector Guerra
Chief Environmental Planner

TELEPHONE NUMBER: (559) 624-7000

MAILING ADDRESS: 5961 South Mooney Boulevard
Visalia, California 93277

2.3 General Operation Information

START-UP DATE: Estimated 2025

MINERAL RESOURCE ZONE (MRZ): Mineral Resource Zone 2 (MRZ-2)

Table 3: Excavation Operation Information

Component	Proposed Plan
Mineral Commodity	Sand and Gravel
Estimated Gross Material Excavated (tons)	16.5 million tons
Estimated Net Aggregate Production (tons) [1]	11.55 million tons
Estimated Maximum Annual Material Excavated (tons/year) [2]	920,000 tons/year
Estimated Maximum Annual Aggregate Production (tons/year) [2]	650,000 tons/year
McKay Point Reservoir Property (acres)	200 acres (approximate)
Area of Disturbance from Excavation Operations (acres)	115 acres (approximate)
Reclamation Boundary (includes the perimeter road/setbacks)	130 acres (approximate)
Anticipated Depth of Excavation Pit (feet bgs)	60- to 75-feet bgs (approximate)
Total Duration of Excavation	20 years (approximate)
Estimated Excavation Initiation Date	2024 (approximate)
Estimated Excavation Completion Date	2044 (approximate)
Estimated Reclamation Completion Date	2046 (approximate)
Estimated Reclamation Monitoring Date	2049 (approximate)

"bgs" = below ground surface
1 – Net tons are the marketable construction-grade aggregate derived through processing. Net tons equate to approximately 70 percent of the gross tons of material excavated.
2 – Based on maximum extraction and production rate(s) at the adjacent Seaborn facility.

3.0 ENVIRONMENTAL SETTING, CCR §3502 (B)(1)

The McKay Point site covers approximately 200 acres, of which approximately 115 acres would be disturbed by excavation operations and 130 acres is included within the reclamation boundary, located within the County of Tulare, on the north side of the divergence of the Lower Kaweah River and St. Johns River. Access to the McKay Point site for haul trucks, work delivery trucks and employee vehicles would come via the existing haul road on the Seaborn site. Figure 1 shows an aerial of the existing site, Figure 2 which shows the layout of the McKay Point site excavation, and Figure 4 shows the cross-sections.

3.1 Geologic Setting

The McKay Point site is located in California's Central Valley, near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The following sections provide a brief summary of the regional and site geologic setting. Also see the geologic, soils, and geotechnical report located in Appendix B which provides additional detail.

3.1.1 Regional Geology

The McKay Point site is located in the San Joaquin Valley, which is the southern portion of the Central Valley of California. The Central Valley formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west. The Central Valley is an alluvial plain approximately 50 miles wide and 400 miles long (north to south). Sediments have been deposited into the Central Valley for the last 160 million years, and can be thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the site is located (SLR, 2021). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, sandstone, and locally granitic rock underlying the alluvium at the site. Beneath these rocks lies an impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000-feet bgs. These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (SLR, 2021).

3.1.2 Site Geology

The McKay Point site is at an elevation of approximately 460- to 470-feet above mean seal level (amsl) and is located in the eastern portion of Kaweah Sub-basin of the San Joaquin Valley Groundwater Basin. This area is underlain by young unconsolidated alluvial deposits (sands and gravels) from the nearby Sierra-Nevada Mountains. These moderately to highly permeable sands and gravels extend to depths of several hundred feet or more. The site vicinity is drained by the Kaweah River and St. Johns Rivers, which deposited these sediments.

The surface soil at the McKay Point site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Site surface drainage is generally to the south and southeast toward the Kaweah River and generally to the south and southwest toward the St. Johns River. The site elevation falls from approximately 472-feet amsl on the northeastern end of the property, to approximately 454-feet amsl on the southwestern end (SLR, 2022).

To quantify the local geology of the McKay Point site, a total of six (6) soil borings were conducted at the site in November 2011 (BSK Associates, 2011). Based on these borings, the thickness of fluvial sediments at the site ranges between approximately 40- and 100-feet bgs. Alluvial deposits at the McKay Point site consist of sand that is about 15- to 20-feet thick. Luhrdorff and Scalmani (1995) describe these sediments as Younger Alluvium. Cobbles, boulders with sand, clay and silt are common below this sand interval. These deposits extended to a depth of about 40-feet bgs on the eastern portion of the site, and to about 100-feet bgs on the western. Luhrdorff and Scalmani (1995) describe these sediments as Older Alluvium. Geologic cross-sections for the McKay Point site have been prepared by Schmidt (2012) and SES (2012), which are included in SLR's Geology and Soils Technical Study (see Appendix B).

The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within about a mile to the north, east, and south of site. The surrounding hill and outcrop features suggest bedrock could get deeper to the west and southwest, towards the valley. Available borings encountered bedrock in the easterly portion of the site at approximately 77-feet bgs. In the westerly portion of the site, bedrock was not encountered within the explored depths of about 90-feet bgs, indicating it would be deeper than that (SLR, 2021).

Available photos of the bedrock cores indicate hard, granitic rock where it was encountered, as shown in Appendix B. Weathered or decomposed bedrock zones and some discontinuous intrusions of clay or clayey sand may also exist. There is an approximately 10- to 15-foot-thick mantle of very dense silty, clayey sand overlying the bedrock. This layer generally follows the top of rock, likewise dipping down to the west. Both the bedrock and the overlying mantle of very dense soils are expected to be less pervious than the overlying alluvial materials and therefore provide a good opportunity to key-in a slurry wall to achieve the desired hydraulic barrier (SLR, 2022).

Faults and Seismicity

The McKay Point site is located in an area of relatively moderate seismicity for California. The site area is centrally located between two (2) zones of significant seismicity: the Eastern Sierra Seismic Zone, located approximately 50 miles to the east, and the San Andreas Fault Zone located approximately 80 miles to the west. There are no active or potentially active faults within 30 miles of the McKay Point site. A map and list of active faults and their respective distances from the site can be found within SLR's Geology and Soils Technical Study (SLR, 2021) in Appendix B.

The nearest potentially active fault is the Independence Fault located approximately 48 miles east. This fault is part of the Owens Valley Fault Zone which is capable of producing large earthquakes, such as the Owens Valley Earthquake of 1872, which is estimated to have been a magnitude 7.4 event.

3.2 Hydrology & Climate

3.2.1 Climate

The Tulare County 2030 General Plan (Tulare County, 2012) and SLR's Hydrology and Water Quality Technical Study (SLR, 2022) both describe the regional climate as typical of the foothill region of California's Central Valley, with cool rainy winters having a mean daily temperature ranging from 40° to 50° Fahrenheit (F), and hot dry summers where daytime temperatures can exceed 100° F.

During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the foothills. During the winter, this high-pressure system is intermittent, allowing

Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and ranges from approximately 10 inches at the base to 25 inches at 3,000-feet. Most of this precipitation occurs from November through April.

3.2.2 Surface Water & Hydrology

As discussed above, the McKay Point site is located in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east.

The site vicinity is drained by the Kaweah River and by the St. Johns River, which drain ultimately to the Tulare Lake bed in the southern end of the San Joaquin Valley. In 1962, Lake Kaweah, located upstream from the McKay Point site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced flooding at the McKay Point site and surrounding area.

The east side of the San Joaquin Valley consists of a broad plain formed by coalescing alluvial fans associated with streams draining the western slopes of the Sierra Nevada. The southern end of the San Joaquin Valley is known as the Tulare Basin. The Tulare Basin is hydrologically closed. Instead of flowing to the ocean, streams from the Sierra Nevada flowing into the Tulare Basin terminate at depressions, the largest of which is the Tulare Lakebed.

The primary natural surface water bodies in the vicinity of the McKay Point site are the Kaweah and St. Johns Rivers, which forms portions of the eastern and southern site boundaries. The Kaweah River flows westward from its headwaters in the Sierra Nevada. Along the southern site perimeter at a location referred to as McKay Point, the Kaweah diverges into two rivers, forming the St. John River and the Lower Kaweah River. Several ponds is located north of the McKay Point site at the adjacent CEMEX aggregate mining operations. A pond is also located on the Kaweah River Rock property to the west of the site. These ponds consist of exposed groundwater, created by previous mining beneath the groundwater elevation.

Downstream of the McKay Point site, the Kaweah River naturally branches into eight (8) or ten (10) shallow channels that overflow during high flows, creating marshlands. These shallow channels were later integrated into irrigation channels and ditches for the delivery of irrigation water in support of agricultural irrigation. The channels still carry non-irrigation flow to Tulare Lakebed during periods of extraordinary precipitation or snowmelt (SLR, 2022).

As discussed in Appendix B, before the Terminus Dam was constructed, extraordinary storm events in December 1955 resulted in an estimated peak flood discharge at McKay Point of 87,000 cubic feet per second (cfs), which is the largest peak runoff from the Kaweah River watershed in the 20th century. Since the construction of Terminus Dam in 1962, most flooding concerns for areas downstream of the dam were greatly alleviated. For example, the peak average daily inflow to Lake Kaweah during the 1966 flood was 105,000 cfs, whereas the maximum release from the dam was 5,666 cfs. Lake Kaweah is operated with an objective of maintaining a flow of less than 5,500 cfs at McKay Point, which includes flow from undammed tributaries such as Dry Creek. Above this flow rate, flood damage can occur to downstream properties, infrastructure, and municipalities (U. S. Army Corps of Engineers, 1990).

The Terminus Dam height was increased by approximately 21 feet in 2004, which further reduced flooding

in the area (U. S. Army Corps of Engineers, 2005). It is estimated that currently the dam provides protection for a design flood event of 50-year return period (FEMA, 2009).

FEMA has prepared a flood hazard map for the area including the site (see Appendix B for FEMA's current flood map). FEMA has calculated base flood elevations for the Kaweah and St. Johns Rivers, but only for stretches downstream of McKay Point. The map indicates that the 100-year flood level near the McKay Point site along the St. Johns River is approximately 465-feet amsl. During most flooding conditions, major and minor flooding in the area is dissipated by diversions to the network of irrigation ditches, irrigation diversions, channel percolation, and evapotranspiration (U. S. Army Corps of Engineers, 1990).

The annual flows vary significantly and since 2001 have ranged from 43,815 acre -feet (AF) per year to 922,247 AF per year. The gauged values are summarized in Appendix B. In approximately 30% of the years the flow is above average, and in the remaining 70% of the years, below average (SLR, 2022).

As discussed above, flows arriving at McKay point are divided between the St. John and Kaweah Rivers by the McKay Point Structure which consists of two (2) flow control structures, one in the St. Johns and one in the Kaweah River. These water control facilities are owned and operated by the Kaweah Delta Water Conservation District and the Kaweah & St. Johns Rivers Association. Both check structures are located immediately downgradient of McKay Point (see Figure 1). The check structures can be closed or opened to control flow rates in the St. Johns and Kaweah Rivers.

Dry Creek flows into the Kaweah River between Terminus Dam and McKay Point, and is the largest source of runoff below Terminus Dam. Dry Creek flows southward from its headwaters and joins the Kaweah River approximately 1.0 mile down from Terminus Dam. Water supply diversions begin immediately downstream of the dam through Hawkeye, Lemoncove, and Foothill ditches, and flows diverted are less than 10,000 acre-feet (AF) per year total. Farther downriver, Washtumna ditch diverts water into Bravo Lake, a 4,000 AF reservoir (SLR, 2022).

Site Drainage

Most of the McKay Point site's surface area is flat, undeveloped open space with few features and no buildings. Site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the river split generally to the south and southwest toward the St. Johns River. The site elevation slopes from approximately 472-feet amsl at the northeastern end of the property, downward to approximately 454-feet amsl at the southwestern end. The site is bordered by the existing Seaborn facility to the west, and the existing CEMEX Lemon Cove aggregate facility to the north and east. The McKay Point site is not expected to receive significant local run-on from the surrounding areas, or generate significant runoff during storm events, due to existing topography and adjacent land uses. Minimal run-on may originate from the north, but existing drainage and topography features along CEMEX's Lemon Cove facility generally direct flows away from the site. Similarly, as discussed below, the site itself generally contains stormwater onsite and does not result in significant runoff onto adjacent properties during storm events.

Given current site topography, typical storm precipitation is generally contained and thus infiltrates into the ground. In the event of a large storm, surface runoff may occur as sheet flow to the south and into the adjacent Kaweah and St. Johns Rivers. As discussed above, The Kaweah and St. Johns Rivers ultimately drain to the Tulare Lake bed in the southern end of the San Joaquin Valley. Figure 1 provides more details regarding the existing site topography as well as onsite and adjacent area drainage features.

Development of the McKay Point site (i.e., excavation and reclamation) would not create large areas of impermeable surfaces and, would not result in increased rates of surface runoff. Conversely, development of the reservoir pit would serve to capture rainfall, thereby reducing surface runoff compared to existing conditions. Additionally, geologic materials exposed in the reservoir would consist of natural sediments which do not contain deleterious materials or chemical constituents capable of degrading surface water quality. Process water would not be generated or discharged to groundwater or surface water as part of the reservoir excavation. The operator (i.e., WCA) will also obtain coverage under the Industrial General Permit (IGP), as required, and storm water runoff from the project area would be managed through proper implementation of Best Management Practices (BMPs) such as sediment and erosion control measures that will be outlined in the site-specific Stormwater Pollution Prevention Plan (SWPPP). Ultimately, completion of mining and post-reclamation development at the McKay Point site is not expected to produce additional runoff or convey pollutants to surrounding waterbodies, as the lowered excavation pit would retain onsite rainfall compared to current site conditions. Sections 4.6 and 5.12 provides more detail.

3.3 Groundwater System

3.3.1 Regional Hydrogeology

The shallow groundwater aquifer underlying the McKay Point site is composed of the alluvial fan deposits associated with the local rivers. In some areas near the site where overlying sediments are relatively thin, such as CEMEX's adjacent Lemon Cove to the north and east and Lindmore areas south of the site, weathered bedrock rocks form the predominant aquifer. For example, one Lemon Cove public supply well is screened in the bedrock aquifer. Additionally, most of the groundwater production south of the Kaweah River is from the bedrock interval (SLR, 2022).

Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley. Groundwater elevations in the region vary from around 400-feet amsl near the McKay Point site, to around 250-feet amsl near the City of Visalia (SLR, 2022). Groundwater is pumped extensively in the area for agricultural and urban uses.

The McKay Point site is located in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (SLR, 2022). The site is also near the eastern boundary of the KDWCD. Approximately 265,000 acres of the KDWCD is irrigated for agriculture, and about 45,000 acres is urbanized. Numerous public and private entities within the KDWCD boundaries divert water from the Kaweah River and its distributaries mainly for irrigation. In addition, almost all of the land served by the KDWCD receives irrigation water obtained from groundwater, often as a supplement to surface water (SLR, 2022).

The KDWCD and surrounding areas have been in long-term groundwater overdraft. Specifically, the KDWCD wide overdraft for the period 2007 to 2017 was estimated at approximately 78,000 AF per year. Most of the overdraft occurs in the western portion of the KDWCD; not the McKay Point vicinity (SLR, 2022).

3.3.2 Site Groundwater Conditions

The long-term water level measurements for wells in the immediate McKay Point area indicate stable water levels, except for temporary declines during drought periods. Eleven (11) monitor wells at the adjacent CEMEX Lemon Cove operation have been monitored since 1994, hydrographs from which indicate that the water levels have been mostly stable, with temporary declines in response to drought

conditions (see Appendix C). Seasonal water level fluctuations in the Project site vicinity have generally varied by less than 20-feet for the last 50 years (SLR, 2022).

Approximate groundwater level elevations range from 463-feet amsl near the east edge of the CEMEX Lemon Cove Facility, located directly north of the McKay Point site, to less than 430-feet amsl in the western part of the CEMEX excavations. The CEMEX excavations have exposed groundwater as the result of the existing permitted surface mining on that site. Groundwater level elevations ranged from about 418- to 438-feet amsl in the area immediately north of the McKay Point site. Soil borings within the McKay Point site indicate depth to water ranges from 20- to 7-feet, with corresponding water level elevations ranging from 438- to 459-feet amsl. See Appendix B for additional detail.

Groundwater elevation measurements on the McKay Point site collected from six (6) onsite soil borings, and the nearby CEMEX wells during November and December 2011, indicate that the groundwater gradient in the immediate vicinity of the McKay Point site was toward the northwest. The CEMEX excavations located immediately to the north of the site, have exposed groundwater because of the permitted surface mining on that site. As presented in Appendix B, groundwater level elevations have ranged from about 438- to 443-feet amsl in the area immediately northwest of the site, to between 456- to 460-feet to the northeast of the site in the 2008 to 2010 period (SLR, 2022).

The main source of recharge to the aquifers in the Site area is groundwater flow from the east. Localized groundwater gradient suggests that the Kaweah River and St. Johns River lose some of their flow to infiltration, and that these rivers are sources of localized groundwater recharge. Other sources of groundwater recharge in the McKay Point site vicinity include infiltration of water used for irrigation, and infiltration from local irrigation ditches in the area and from seasonal surface water flow.

As described previously, excavation on the McKay Point site would commence in the northwest corner of the site, reaching a final depth of approximately 60- to 75-feet bgs (depending on the depth to bedrock). Per the Hydrology and Water Quality Technical Study completed by SLR, groundwater is expected to occur at depths of approximately 20- to 7-feet bgs. Therefore, to inhibit groundwater from entering the excavation pit/reservoir basin, a slurry wall would be installed around the perimeter of the pit early in the excavation process to decrease incoming groundwater seepage. The slurry wall would decrease the amount of groundwater seepage into the reservoir, but some amount of seepage remains likely. If needed, dewatering of this seepage from the reservoir may be necessary. The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel fill infiltration gallery along and outside of the northern border of the slurry wall as shown on Figure 2. Please see Section 4.4 below and Appendix C for additional details regarding the slurry wall and onsite groundwater management.

3.4 Soils, Erosion, & Slope Stability

3.4.1 Soils

Soils underlying the McKay Point site were assessed and discussed in the Geology and Soils Technical Study (SLR, 2021). As described above, the McKay Point site is essentially flat, sloping gently downward to the south and west. The site is undeveloped, so erosion is minimal and there are no known slope failures at the site. Soil erosion is limited to the relatively steep slopes facing the Kaweah River at the southern portion of the site, and select portions of the few man-made dirt roads at the site. Other than these small areas, the McKay site is almost entirely covered with existing vegetation.

The upper 5- to 10-feet of the onsite soil consists of poorly-graded sand with increasing gravel at depth. Below 15-feet, the soil consists of sandy and silty gravel of increasing size and rounded cobbles to approximately 30- to 35-feet bgs. At greater depth, silty clayey sand and silty clay/low plasticity clay are predominant before bedrock is encountered (SLR, 2021).

Generally, where a reclamation plan calls for revegetation of areas disturbed by surface mining, SMARA regulations (§3711) require salvage of topsoil and other suitable growth media (subsoil) prior to mining for redistribution in areas to be revegetated once mining operations are complete. However, SMARA also states that revegetation efforts, including salvage of topsoil and subsoil, might not be necessary if the approved reclaimed end use of a site is not consistent with the revegetation requirements of SMARA. Specifically, SMARA Section 3705 (Performance Standards for Revegetation) states "revegetation shall be part of the approved plan, *unless* it is not consistent with the approved end use" (§3705). As stated previously, the proposed reclaimed end use of the McKay Point site is an excavation pit prepared and stabilized such that it can be readily adaptable into a water storage and re-regulation reservoir. Because of the reservoir's capacity needs, combined with the various other design criteria required for reservoir construction (i.e., slurry wall, inlet and outlet structures, a perimeter maintenance road and related areas for auxiliary structures/activities), there would not be a feasible way to revegetate the site in a manner that meets the SMARA revegetation success criteria, nor would it be beneficial as the site would be developed into a water storage reservoir immediately following cessation of mining/completion of reclamation. Specifically, the reservoir and support structures would require the use of virtually the entire 110-acre area disturbed by excavation/surface mining, and the 130-acre shown within the site reclamation boundary (see Figure 2 through Figure 4). Therefore, the provisions of SMARA related to the salvage of topsoil and other suitable growth media/subsoil (§3711) as well as revegetation (§3705) are not applicable. See Section 4.2 and Section 5.11 provide additional detail.

3.4.2 Erosion, Sediment Transport, & Windblown Dust

Erosion is the removal of soils and rocks due to natural processes such as flow of water and wind. Erosion has the potential to occur within the McKay Point site as a result of excavation, but would generally only occur within the center of the excavation pit, and not at the native ground surface (i.e., outside the site perimeter/operational boundary).

Erosion, sediment transport and windblown dust would be controlled by implementation of the storm water BMPs, ongoing compliance with San Joaquin Valley Air Pollution Control District (SJVAPCD) applicable rules and regulations, and site-specific protocols/inspections conducted by the operator. BMPs which manage off-site sediment transport during operations and rain events would be outlined in the site-specific SWPPP. The SJVAPCD rules found under Regulation IV (Prohibitions) and Regulation VIII (Fugitive PM_{10} Prohibitions) prescribe measures for the management of windblown dust. Sections 4.6 and 5.12 provide summaries of storm water and air quality BMPs to be implemented onsite that would control erosion and dust.

Stability and erosion of the excavation pit slopes would also be controlled by the construction of a slurry wall early in the excavation process, as well as by the placement of riprap in areas above the slurry wall to further minimize erosion. Figure 2 shows the proposed locations of the perimeter slurry wall and riprap stabilization within the excavation pit. Also see Section 4.4 below for additional detail related to the slurry wall which would help ensure erosion is minimized.

3.5 Vegetation & Biological Resources

Biological surveys were conducted on the McKay Point site by Bumgardner Biological Consulting (BBC) in 2013 and 2021. The biological technical reports are provided in Appendix D. The following sections provide a summary of the field survey results.

3.5.1 Vegetation Communities

The pre-development condition of the McKay Point site was characterized by BBC in 2013 and in 2021. As described in BBC's reports, the existing McKay property is flat and has been used most recently to support cattle grazing. There are no developed uses on the existing McKay site. Much of the onsite vegetation consists of nonnative annual grassland. Specifically, most of the vegetation consists of nonnative annual grasses (e.g., wild oat [*Avena fatua*]), but also herbaceous species such as lamb's-quarters (*Chenopodium album*), wild cucumber (*Marah* sp.), and deer weed (*Acmispon glaber*). Small, scattered stands of mule fat (*Baccharis salicifolia*) also occur within the non-native annual grassland. However, these latter stands are not significant enough in size to warrant mapping as a discernible vegetation community.

There is a mixed oak riparian woodland located in the southeast of the McKay Point property; however, this area is located outside the area of disturbance from the mine/reclamation plan. Woody species that are associated with the mixed oak-riparian woodland include willows (*Salix* spp.), Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizeni*). California wild grape (*Vitis californica*) occurs as a liana growing into the canopy of the woody species. The canopy cover in this stand of vegetation varies between approximately 20% and 100% and is best described as interrupted woodland.

Approximately 39.8 acres of elderberry savannah-riparian woodland (a sensitive vegetation community tracked by the California Department of Fish and Wildlife [CDFW]) occurs adjacent to the mixed oak-riparian woodland, and extends west along the southern border of the McKay Point site. The dominant species in the elderberry savannah-riparian woodland is blue elderberry. However, scattered Fremont's cottonwoods and willows also occur in this vegetation community. The onsite elderberry shrubs/clumps are large and old with many stems and likely represent the remnants of a formerly more contiguous community. See BBC's biological technical reports in Appendix D for additional detail.

3.5.2 Wildlife

Plant communities provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. Specifically, the site and surrounding habitat have the potential to support a variety of reptilian, avian and mammalian species. Additionally, the site provides suitable foraging, nesting, and cover habitat for a variety of resident and migrant bird species. The surveys completed by BBC in 2013 and in 2021 within and adjacent to the McKay Point site resulted in the documentation of relatively low wildlife diversity (i.e., two (2) species of amphibians, one (1) species of reptile, fourteen (14) species of birds, and five (5) species of mammals). The biological technical reports are included in Appendix D and provide a comprehensive list of wildlife species that could potentially occur within the McKay Point site (Bumgardner Biological Consulting, 2021).

As noted in BBC's reports, other wildlife species probably occur on or near the McKay Point site, but would not likely be found in one-day reconnaissance-level surveys. These other species include, but are not limited to, southern alligator lizard (*Elgaria multicarinata*), western skink (*Plestiodon skiltonianus*),

common kingsnake (*Lampropeltis getula*), Pacific gopher snake (*Pituophis catenifer*), northern pacific rattlesnake (*Crotalus oreganus*), several species of small mammals, several species of oak or riparian-associated passerines (i.e., songbirds), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*).

3.5.3 Special-Status Species

The biological resources reports prepared by BBC evaluated conditions of the habitat(s) within and immediately adjacent to the McKay Point site to determine if the existing plant communities, at the time of the surveys, had the potential to provide suitable habitat(s) for special-status plant and wildlife species. Special-status plant and wildlife species were evaluated for their potential to occur within the site based on habitat requirements, availability and quality of suitable habitat, and known distributions. No special-status plant species and only two (2) wildlife species were observed within the McKay Point site during BBC's surveys. Refer to the biological resource reports (Appendix D) for a detailed special-status plant and wildlife species analysis.

Special-Status Plants

No special-status plant taxa were observed on or immediately adjacent to the McKay Point site during the surveys. In addition, no special-status plant taxa that have been documented in the region are considered to have any potential to occur on the McKay Point site given the onsite conditions (i.e., lack of suitable habitat for and/or known distribution of the species).

Special-Status Wildlife

Only two (2) special-status wildlife species were observed on the McKay Point site during the surveys. One of these species (i.e., Nuttall's woodpecker) is a likely year-round resident in the mixed oak-riparian woodland in the southeastern portion of the site. The second species (i.e., willow flycatcher) was only observed during the September 18, 2013 survey and is considered a migrant that passes through the area (including the McKay site). Furthermore, this latter species is only considered a special-status species when nesting (typically in dense willow scrub in the Sierra Nevada).

Sixteen (16) special-status wildlife species that have been documented in the McKay Point site region (see Table 1 in Appendix D) are considered to have some potential to occur on or near McKay Point site. The special-status wildlife summaries are presented in the biological resource reports (Appendix D).

4.0 MINING PLAN, CCR §2772, §3502, §3503

4.1 Mining Operations, CCR §2772(c)(3)-(4), (6)

As previously described, in order to prepare the McKay Point site for future uses as a surface water storage and re-regulation reservoir (i.e., McKay Point Reservoir), the site would first need to be excavated to a sufficient depth and surface area that meets the necessary water storage capacity requirements. Ultimately, the excavated area would result in an open pit/basin with a total surface area of approximately 115 acres and a final depth of approximately 60- to 75-feet bgs (depending on the depth to bedrock). Excavation of the McKay Point site and processing of the extracted material would be completed by WCA.

WCA anticipates that excavation of the reservoir would commence in 2024. Excavation of the site would occur in one (1) single phase, beginning in the western portion of the McKay Point site and progressing eastward until the final depth (i.e., 60- to 75-feet bgs) and surface area (i.e., 115 acres) is achieved (see Figure 2). Final slopes are anticipated to be approximately 3H:1V (horizontal to vertical) in order to minimize any bank erosion from the wind and water; however, the slopes would be over-excavated to a maximum 1H:1V slope and then backfilled to the final 3H:1V slope condition. To ensure the excavation pit remains dry and the interim slopes remain stable, a slurry wall would be built around the perimeter of the 115-acre excavation pit area early in the excavation process. Once installed, the slurry wall would minimize groundwater seepage to allow for dry mining operations (i.e., no need for draglines), as well as further protect the pit slopes from wind and water erosion. Riprap would be placed along the top portion of the excavation pit walls to further protect the slopes from erosion. Other ancillary structures (e.g., perimeter earthen road, perimeter fencing, etc.) would also be constructed and installed during site excavation. Reservoir excavation activities would be conducted in accordance with applicable SMARA requirements. Figure 2 and Figure 4 shows the design of the reservoir excavation site.

Material would be extracted from the McKay Point site by WCA using mobile equipment (excavators, loaders, etc.). Excavated material would be processed onsite, primarily with an aggregate processing plant (i.e., wash/screen) and intermittently with a portable crush/recycle plant (crush/recycle). Haul trucks would be used for transfer to the onsite aggregate processing plants. WCA would also import concrete rubble for recycling at the crush/recycle plant. Soil amendments would be brought onsite to be blended with the processed aggregate to meet their customers specifications. Once processed, material would be loaded directly into haul trucks and delivered to WCA's customers, or to their other permitted facilities throughout the region as needed (see Figure 2).

It's estimated that approximately 70% of the excavated materials would be of marketable quality, which is referred to as net tons. An estimated total of approximately 11.55 million tons of saleable (net) aggregate would be extracted over approximately 20-years excavation. The gross extraction of all material would be approximately 16.5 million tons, which includes the removal of the overburden and waste rock (unusable aggregate). Additionally, it's estimated approximately 100,000 tons per year of recyclable concrete materials and other soil amendments would be brought onsite for processing.

The overburden and excess fines resulting from the excavation of the pit and processing of materials would be primarily used onsite to construct the service road around the perimeter of the reservoir pit/basin or as backfill to achieve desired 3H:1V (horizontal: vertical) final slopes. Additionally, overburden may also be stored in various temporary stockpiles located throughout the bottom of the excavation pit as needed (see Figure 2). The excess overburden and/or fines may be sold by WCA as soil amendments or a slurry used in nonstructural concrete or as miscellaneous fill material, as WCA has done in the past with overburden and fines resulting from their mining activities. Excess overburden and/or fines may also

be delivered to WCA's other permitted facilities throughout the region as needed, consistent with their existing permitted operations.

It is estimated that surface mining/reservoir excavation operations in the McKay Point site would cease by approximately the end of 2044, at which time the site would be reclaimed to a condition suitable for future use as a water storage reservoir. It is estimated that the McKay site, including reservoir pit/slopes and perimeter road, would be fully stabilized and reclaimed by 2049.

4.1.1 History of McKay Point Site Area, CCR §3502 (b)(1)

The Owners jointly own approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, referred to as the McKay Point property (i.e., McKay Point site). Together, the Owners are the holders of pre-1914 and post-1919 appropriative water rights on the Kaweah and/or the St. Johns Rivers. The Owners are proposing to develop approximately 200 acres of property within the larger 500-acre McKay Point property into a surface water storage and re-regulation reservoir (i.e., the McKay Point Reservoir). As discussed above, to prepare the site for future development of the McKay Point Reservoir, onsite excavation would develop an open pit with a surface area of approximately 115 acres and a depth of approximately 60- to 75-feet bgs (depending on the depth to bedrock).

Historically, the McKay Point site has been used for cattle grazing under lease arrangements. There is no history of surface mining within the McKay Point site, and there are no existing buildings or features found onsite; however, the adjacent Seaborn site has been an active aggregate surface mining and processing facility since the 1950's. Most of the McKay Point site is vegetated with non-native grasses except for a small portion of ground along the adjacent Kaweah River above McKay Point, which is vegetated by native trees and shrubs.

The land underlying the McKay Point site is zoned AE-20 (Exclusive Agriculture Zone – 20 Acre Minimum), with a Tulare County General Plan designation of "Valley Agriculture". Additionally, the site is within a "Mineral Resource Area (MRZ-2b)" as designated by the California Geological Survey (CGS) and County General Plan (Tulare County, 2012). The State Geologist, in accordance with the State Board's Guidelines for Classification and Designation of Mineral Lands, has classified the underlying land as MRZ-2b, which includes:

> *Areas underlain by mineral deposits where geologic data indicate that significant inferred resources are present. Areas classified MRZ-2b contain discovered mineral deposits that are either significant inferred resources or indicated reserves. Land included in MRZ-2b is of importance because it contains potential economic mineral deposits.*

Within the AE-20 zone, Tulare County permits mining and the extraction of minerals, upon approval of a Reclamation Plan and Financial Assurance Cost Estimate (FACE). Because the excavation of the pit for the reservoir is a surface mining activity, as defined in SMARA, WCA is required to comply with SMARA and obtain the County's approval of a Surface Mining Permit, Reclamation Plan, and Financial Assurance Cost Estimate (FACE).

As discussed previously, the Owners also purchased the Seaborn site, directly adjacent to the west of the McKay Point site, to provide access to the McKay Point site. The mining and processing activities being conducted on the Seaborn site have been discontinued by the Owners, and excavation activities would transfer over to the McKay Point site following approval of this Reclamation Plan and related financial

assurances by the County. During excavation and reclamation activities at the McKay Point site, the Seaborn site would be used primarily for ingress and egress for haul trucks and worker vehicles via the existing access road which connects to Road 222. The extraction and processing of aggregate at the McKay Point site has been designed not to exceed the maximum production rate historically achieved at the Seaborn site operations. Due to this design feature, the number of haul trucks and vehicles on public roadways would also not increase above existing levels as a result of reservoir excavation operations at McKay Point.

4.1.2 Site Preparation

Prior to initiating mining, WCA would clear the western portion of the site of any rubbish or debris and remove the area of vegetation using mobile equipment (i.e., scrapers, dozers, and excavators). Topsoil and subsoil may also be removed in this area and stored for separately for later use to construct the perimeter access road (see Figure 2). Excess topsoil and subsoil fines removed from the site may also be sold by WCA as slurry to be used in nonstructural concrete or miscellaneous fill material. Once the initial mining area in the northwest portion of the McKay Point site is prepared, normal excavation operations would commence.

4.1.3 Mining Operations

Excavation of the reservoir pit would commence in the western portion of the McKay Point site. Excavation operations would be typical of surface aggregate mining operations in dry conditions. WCA would extract construction grade aggregate (sand and gravel) from the site in one (1) single mining phase. WCA would initially mine to a final depth of 60- to 75-feet bgs (estimate depth to bedrock) in this area. Once the final depth is reached in this area, mining would progress to the east/south until the entire 115-acre reservoir basin has been fully excavated (estimated to take 20 years). The excavation pit would eventually result in a basin with a 115-acre surface area, a final depth of 60- to 75-feet bgs, and finished side slopes with a maximum a maximum 3H:1V (horizontal to vertical) gradient. Figure 2 shows the McKay Point excavation site/mine design.

Aggregate would be excavated using the mobile equipment summarized below. Excavated material will be transferred by haul truck or other equipment to the portable processing plants (i.e., wash/screen and/or crush/recycle [if necessary]) located within the excavation pit. As excavation progresses, the portable plant(s) would be relocated as necessary to reduce the distance excavated materials would need to be transported for processing. Temporary stockpiles of materials would also be located in various areas throughout the site as needed, depending on the location of excavation and processing. Additionally, electricity for the aggregate processing plant would be provided by Southern California Edison (SCE) through existing electrical infrastructure located in the northern area of the McKay property (see Figure 2). When operating onsite, the portable crush/recycle plant would be powered by portable diesel generator. The mobile equipment used during the excavation of the site would include the following:

- Excavator
- Off-road Haul Trucks
- D9 Dozer
- Loader
- Portable Generator
- Grader
- Water Truck
- Scraper
- Backhoe
- Pneumatic Pumps

Once processed onsite, material would then be loaded into haul trucks for transport to WCA's customers or to their other permitted facilities throughout the region as needed. The haul trucks would enter and exit the site through the existing access road connecting to the Seaborn site to the west, and would enter the pit using a stabilized access ramp as shown on Figure 2. Because the annual production rate would not exceed the rate historically achieved at the adjacent Seaborn facility, the number of haul trucks on public roadways would also not increase beyond the number associated with the mining operations on the Seaborn site.

Approximately seven (7) to twelve (12) onsite employees would be required during excavation of the reservoir site. Employee vehicle access to the McKay site would also be through the existing Seaborn site access road. Excavation would occur between 4:00 a.m. (or dawn if later) and 6:00 p.m., Monday through Saturday, and continue until the desired depth and extent of excavation is achieved required for the final reservoir design. Nighttime construction activities are not proposed.

4.1.4 Buffer Zones/Setbacks

No excavation of material would take place within 30-feet from adjacent property lines. Excavation would also be setback a minimum of 50-feet from the banks of the Lower Kaweah and St. Johns Rivers. In addition, the mixed oak-riparian woodland located to the east would also not be disturbed, and a minimum 50-foot buffer would be maintained around the woodland area. Other than installation of small ancillary structures, such as the perimeter wire fence, no other construction would occur within these setbacks. Figure 2 shows the various McKay Point site setbacks and buffer zones.

Due to the isolated nature of the McKay Point site, and that fact that there are no developed residential areas adjacent to the site other than one residence owned by TID located across the Kaweah River south of McKay Point, screening or buffering to prevent offsite noise and/or visual impacts is not proposed. Specifically, no perimeter berms, screens, landscaping, etc. are proposed during excavation. Additionally, the majority of excavation and processing operations would occur below grade (approximately 60- to 75-feet bgs), and would therefore not be visible from adjacent areas.

4.2 Mine Wastes, CCR §2772 (c)(8)(A)

The only potential mining waste that may be produced during reservoir excavation, as defined in Section 2772 of the Public Resources Code, would be excess soils, waste rock, and/or overburden. The overburden and excess fines resulting from the excavation of the reservoir would be stored on the site and used onsite as feasible in the construction of the perimeter road around the pit and other auxiliary structures (e.g., slurry wall, riprap, etc.). Additionally, excess soils and overburden would be stored on the site for use in backfilling the pit walls to a safe slope as required by SMARA, specifically to backfill the excavation slopes to a final 3H:1V (horizontal: vertical) slope configuration. The remainder of the fines could be sold by WCA as slurry used in nonstructural concrete or as miscellaneous fill material, or transferred to WCA's other permitted facilities for storage, as WCA has done in the past with overburden and fines resulting from their mining activities at other facilities in Tulare County. There would not be any tailings, slag, and other processed waste material, associated with the excavation and processing activities at the McKay Point site.

Additionally, the site is currently undeveloped with no debris and/or buildings currently present onsite that would need to be demolished or disposed of prior to excavation, nor would any onsite structures need to be demolished or removed as part of reclamation.

4.3 Material Processing

Excavated materials would be processed into marketable materials onsite using a wash/screen plant and a portable crush/recycle plant, as necessary. If needed, WCA would bring a portable crush/recycle plant on site to break up oversized pieces of rock prior to screening in the processing/wash plant. The crush/recycle plant could also be used to recycle used concrete and asphalt brought in from offsite. WCA may also import materials to be blended with the aggregate if required by their customers. Processed material would be stockpiled adjacent to the plant(s), and loaded into haul trucks for delivery to WCA's customers or to their other permitted facilities as needed.

4.4 Slurry Wall

As discussed previously, because the groundwater table on the McKay Point site is at a depth of approximately 7- to 20-feet below the native ground surface, a slurry wall would be constructed around the inside perimeter of the pit. Slurry walls are below-grade walls that restrict groundwater flow or support excavations and structures, using soil-bentonite or cement-bentonite. A slurry wall would be installed early during the excavation phase to slow or eliminate groundwater from flowing into the pit during excavation and construction phases and to maintain an evacuated state as part of the long-term operations (i.e., a full reservoir has limited water re-regulation value).

The slurry wall would be a permanent fixture of the reservoir facility that would remain post-excavation and site reclamation, and would serve as an essential feature to maintain dewatered storage space to receive water diversions by the Owners once the full reservoir is constructed and operational. Specifically, the dewatering flows would be minimized to approximately 500 gallons per minute (gpm) during reservoir excavation, and reservoir facility construction and long-term reservoir that would occur post-reclamation.

Early in the excavation phase, slurry wall construction would consist of clearing and grubbing approximately 26 acres around the perimeter of the excavation area, excavating approximately 109,000 cubic yards of native soil, and poring of the slurry wall soil-bentonite or cement-bentonite mixture into the excavated trench. Approximately 4,000 dry tons of bentonite and 56,000 tons of silty/clay fines would be delivered to the site for use in the slurry wall. The bentonite-water slurry would be pumped into the trench to hold the sides of the trench open during the construction of the slurry wall. A mixture of bentonite, silty/clay fines and native soil would be used for the final slurry wall. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the slurry wall once constructed.

4.5 Groundwater/Production Water

4.5.1 Groundwater

As discussed above, because the groundwater table under the McKay Point site is expected at an approximate depth of 7- to 20-feet bgs, a slurry wall would be constructed around the inside perimeter of the 115-acre pit. area early in the excavation process to minimize groundwater seepage into the pit and allow for dry mining techniques (i.e., no draglines). This would maintain the pit in a relatively dry condition such that dry mining methods could be used. If there is some groundwater seepage or accumulation of stormwater, the water would be pump from the pit and stored onsite to be recycled in the processing plant, used for dust control, or recirculated in the infiltration galleries constructed along the northern perimeter of the pit. The infiltration galleries would consist of appropriately designed ditches that are covered with granular materials allowing water to percolate back to groundwater. See Figure 2 which shows the location and design of the slurry wall and infiltration galleries.

As discussed in Section 1.1, one (1) groundwater well would be installed within the northern portion of the McKay site prior to excavation. The primary use of water at the Project site would be to control fugitive dust. Water would also be used for onsite material processing (i.e., aggregate wash/screen plant and portable crush/recycle plant). The water would be obtained either by pumping it from the pit or drawn from an onsite groundwater well. Total water consumption during excavation and reclamation activities would average 3.5 million gallons per year (i.e., approximately 11 acre-feet per year).

The proposed onsite groundwater well would draw from the San Joaquin Valley Groundwater Basin – Kaweah Subbasin, which underlies the site. The Kaweah Subbasin is designated a "high-priority subbasin" per the California Sustainable Groundwater Management Act of 2014 (SGMA), and is managed by the Greater Kaweah Groundwater Sustainability Agency (GSA). As identified in the Groundwater Sustainability Plan – Greater Kaweah Groundwater Sustainability Agency (Greater Kaweah Groundwater Sustainability Agency, 2020), beneficial uses of groundwater within the basin's jurisdiction primarily include agricultural, industrial, and municipal and domestic supply wells.

The shallow aquifer in the vicinity of the McKay Point site is unconfined (Schmidt, 2012) and water levels are significantly higher than the minimum threshold and measurable objective levels. The long-term water-level measurements for wells in the McKay Point area indicate a stability of groundwater levels, except for temporary declines during drought periods. Seasonal water level fluctuations in the site vicinity have generally varied by less than 20-feet for the last 50 years (Fugro, 2007). Test borings within the McKay site indicate depth to groundwater ranging from 20- to 7-feet below bgs, with corresponding groundwater level elevations ranging from 438- to 443-feet amsl in the area immediately northwest of the site, to between 456- to 460-feet to the northeast of the site in the 2008 to 2010 period. Because the proposed excavation depth (i.e., 60- to 75-feet bgs) is below the groundwater table (20- to 7-feet bgs), the slurry wall would be installed around the reservoir slopes to ensure groundwater inflows are kept to a minimum of approximately 500 gpm. Ultimately, through the construction of the slurry wall and the use of infiltration galleries, the McKay site is expected to increase groundwater recharge potential in the area compared to existing conditions. Please see SLR's Hydrology and Water Quality Technical Study in Appendix C for more detail.

4.5.2 Fresh Water

During site excavation operations, water would primarily be utilized for dust control and material processing (i.e., washing aggregate material in the plant[s]) within the McKay Point site. No landscaping that would require irrigation is proposed onsite. Water would be provided by a water well, proposed to be installed in the northern portion of the McKay Point site (see Figure 1). Water for dust suppression and material processing would either be directly piped from the well to the processing plant(s), or pumped to a mobile water truck and transported and applied throughout the McKay site as needed.

As summarized in Section 4.5.1, total water consumption during excavation activities would average 3.5 million gallons per year (i.e., approximately 11 acre-feet per year). WCA also estimates that the aggregate plant would require up to approximately 1,500 gallons per minute (gpm) of water, while and estimated 12,000 gallons per hour (gph) would be required for dust control. The amount of fresh water used onsite on an hourly and daily basis would vary, depending on season, wind and soil conditions.

Water that falls on the McKay Point site, either due to dust suppression applications or as a result of storm events, would be contained onsite within the pit and/or naturally evaporate or infiltrate into the ground. As discussed in Section 3.2.2, no permanent waterways, streams, or diversions channels currently exist

on the McKay Point site. The final reclaimed pit would have a maximum gradient of 3H:1V (horizontal:vertical) and has been designed to minimize any bank erosion from the wind and water. Additionally, prior to initiation of onsite excavation activities, a site-specific SWPPP would be developed that would outline specific erosions control measures and BMP's to be installed onsite to further prevent erosion and discharge during storm events. Additionally, the upper portions of the pit slopes for several feet above will be covered with suitable riprap from natural stone sources or processed construction concrete debris to prevent erosion. Due to these measures, excavation of the pit would not impact the adjacent rivers or other surface water bodies in the area (i.e., Lower Kaweah River and St. Johns River). Please see the Hydrology and Water Quality Technical Study in Appendix C for more detail regarding onsite drainage and erosion controls.

4.5.3 Wastewater

No wastewater would be generated during excavation operations. Minimal quantities of wash water would be generated during the aggregate washing operations at the onsite processing plant(s). This water would either be recycled in the plant or used for dust control onsite. A mobile water truck would be utilized onsite for dust suppression, and water applied to the site for this purpose would either naturally evaporate or infiltrate into the ground.

The Project would not use septic tanks or alternative wastewater treatment systems. Temporary portable toilets would be placed at the McKay Point site. The portable toilets would be placed within secondary containment, and would be regularly maintained by a local contractor. Operations at the McKay Point Reservoir would not produce any industrial or domestic wastewater discharges onsite.

Diesel, gasoline and/or lubricating oil would be used in equipment and vehicles operating onsite. If there is a need to store minor amounts of hazardous materials, such as fuels, oils, and other routine maintenance materials, these materials would be stored in secondary containment and spill response equipment would be located on site as required by local, state and federal hazardous materials/waste regulations. The following good housekeeping measures for vehicle storage and minor maintenance would be implemented at the site:

- Prevent oil, grease, or fuel leaks to the ground, storm drains or surface waters.
- Place equipment and vehicles that are to be fueled, maintained, or stored in designated areas with appropriate BMPs installed.
- Clean up spills and leaks immediately and dispose of spilled material and spill cleanup materials properly.

Any potentially hazardous wastes generated during cleanup of accidental spills and/or equipment repairs would be properly disposed of in accordance with local, state, and federal regulations.

4.6 Erosion & Sediment Control, CCR §3503(a), §3503(e), §3506

Excavation of the McKay Point site would be subject to the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities (Industrial General Permit). Prior to commencement of excavation, a site-specific SWPPP would be prepared that complies with the Industrial General Permit (IGP). The SWPPP would include specific prohibitions, effluent limitations, source identification, practices to reduce pollutants, assessment of pollutant sources, materials inventory, preventative maintenance program, spill prevention and response

procedures, general storm water BMPs, training, record keeping, sampling procedures and a description of the monitoring program. The SWPPP is considered a living document and would be updated as needed to address changing conditions on the site through the excavation and reclamation project phases.

As discussed previously, a slurry wall would be constructed around the pit walls early in the excavation process to protect the slopes from erosion. The top portions of the pit walls would also be protected from erosion using riprap. Table 4 summarizes potential erosion control BMPs to be implemented at the site. These BMPs would also be incorporated into the site-specific SWPPP, which would be prepared at a later date prior to commencement of mining operations.

Table 4: Summary of Erosion BMPs

Industrial Activity/Material	Potential Pollutants	BMPs Implemented	Required Equipment & Tools
Excavation and transfer of aggregate materials	Sediment	Erosion control; Sediment control; Stormwater containment.	Silt fencing and fiber rolls; Bulldozer for berm maintenance as needed.
	Dust	Wind erosion control; Erosion control; Sediment control; Tracking control.	Water truck; Soil binders.
Equipment and vehicle maintenance	Oil & Grease Hydrocarbons Gross Pollutants Trace Metals	Good housekeeping; Spill prevention & maintenance; Interior berms as needed to direct surface flows to pit; Secondary containment.	Covered trash bin; Spill kit; Mobile equipment for BMP maintenance.

Temporary stockpiling of raw excavated material and processed aggregate is anticipated. For example, temporary stockpiles may be formed adjacent to active excavation areas and/or the processing plant(s). Temporary stockpile locations would vary throughout the site as excavation operations progress from west to east; however, the stockpiles would be placed within the bottom of the excavation pit, and therefore stockpile erosion would not migrate offsite. BMPs, such as sandbags, fiber rolls, or silt fencing, would be installed around the stockpiles as needed, primarily prior to storm events, to prevent erosion.

4.7 Blasting

Due to the nature of the material to be excavated (i.e., sand and gravel) found on the McKay Point site, blasting is not required. The sand and gravel resources at the McKay Point site will be extracted using conventional earth moving equipment, without the need for disaggregation. Therefore, no explosives would be stored and/or utilized within the site area during reservoir excavation.

5.0 RECLAMATION PLAN

The following section has been prepared and organized pursuant to the requirements outlined within the SMARA and the County's requirements. The California Code of Regulations (CCR) citations presented within each titled section reference specific SMARA statutes applicable to each section (also see the "Table of Compliance for SMARA Requirements" at the beginning of this Reclamation Plan).

Once surface mining (i.e., reservoir excavation) operations are completed, the McKay Point site would be reclaimed in accordance with SMARA and County standards. The proposed reclaimed end use for the McKay Point site would be a stabilized pit/basin (approximately 110-foot surface area, with a 60- to 75-foot bgs final depth) with 3H:1V (horizontal:vertical) side slopes, and ancillary structures (e.g., perimeter access road, slurry wall, infiltration galleries, riprap, etc.), that would be readily adaptable for future use as a surface water storage and re-regulation reservoir. The following sections provide additional details related to site reclamation.

5.1 Existing & Proposed Land Uses, CCR §2772 (c)(7), §3502 (b)(1)

Existing land uses near the McKay Point site include the existing Seaborn facility located immediately west, and the CEMEX Lemon Cove aggregate facility located immediately to the north and east. The divergence of the Lower Kaweah River and St. Johns River is located immediately south of the site. Various open space areas, agricultural lands and scattered rural residences (one of which is owned by the TID) are located further south across the Lower Kaweah and St. Johns Rivers. See Figure 1 which displays the site setting, as well as Table 5 below which further describes the nearby land uses. Also see Figure 3 which show the layout and design of the reclaimed McKay Point Reservoir post-mining, and Figure 4 which shows the final site cross-sections.

Table 5: Surrounding Land Uses

Direction	Land Use	Distance from Site (feet)
North	Aggregate Facility (CEMEX)	Adjacent
South	Open Space / Agricultural Land / TID-Owned Residence	Approximately 200-feet (across Lower Kaweah and St. Johns Rivers)
East	Aggregate Facility / Open Space	Adjacent / Approximately 225-feet (across Lower Kaweah River)
West	Aggregate Facility (Seaborn)	Adjacent

As discussed in Section 1.2, the existing McKay Point property is currently undeveloped, and has been previously disturbed due to historical use for cattle grazing under lease arrangements. Other than minimal vegetation, there are no permanent buildings or topographical features found on the existing site that would need to be removed prior to reservoir excavation and/or site reclamation.

As discussed previously, the McKay Point site is zoned AE-20 (Exclusive Agriculture Zone – 20-Acre Minimum), with a General Plan designation of Valley Agriculture. The site is also located within a State-designated Mineral Resource Area (MRZ-2b). Subject to approval of a Surface Mining Permit and Reclamation Plan and a FACE, the County permits mining and the extraction of minerals (i.e., reservoir excavation) within the AE-20 zone.

Additionally, per the California Resources Agency, Division of Land Resource Protection, the entire McKay Point site is designated as “Grazing Land”, which, among other definitions, includes "land on which the existing vegetation is suited to the grazing." The site is not designated Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance, nor is it under a Williamson Act contract. Additionally, there are no forestlands on or near the McKay Point site. Excavation and reclamation of the site would also not result in the cancellation of an open space contract pursuant to the California Land Conservation Act of 1965, or Farmland Security Zone Contract pursuant to Public Resources Code § 15206(b)(3).

As discussed above, following excavation of the reservoir, reclamation of the McKay Point site would result in a stable and dry basin that would be readily adaptable into the McKay Point Reservoir (i.e., surface water storage/re-regulation reservoir). The stabilized reservoir basin is the proposed reclaimed end use pursuant to SMARA. The reservoir has been designed to complement the existing surrounding environmental setting, including the Seaborn facility immediately west. Please note, because the entirety of the reclaimed site would remain a reservoir basin with a perimeter access road, topsoil/subsoil salvage and revegetation of the site is not feasible as part of site reclamation, nor would it be appropriate or adaptable for the site’s final end use. Please see Section 5.2 below for additional detail.

5.2 Visibility, CCR §3502 (b)(1), (2)

The McKay Point site is located in a semi-rural area of unincorporated Tulare County, California. Surrounding land uses near the site are described in Section 5.1 and summarized in Table 5 above.

As discussed previously, the existing topography within and immediately adjacent to the McKay Point property is generally flat. The site is located near the western boundary in the low foothills of the Sierra Nevada Geomorphic Province of California. Prominent public roadways located in close proximity to the McKay Point Reservoir site are summarized in Table 6 below.

Table 6: Surrounding Roadways

Direction	Roadway	Distance from Site
North	State Route 216 (SR-216) / Lomitas Drive	0.7 miles
South	State Route 198 (SR-198) / Sierra Drive	1.8 miles
East	State Route 198 (SR-198) / Sierra Drive	0.8 miles
West	State Route 245 (SR-245) / Road 212	1.8 miles

While the areas surrounding the site are mostly flat with little existing topographic features, the slight north-south slope of the site and the existing vegetation and agricultural orchards that surround the site on all sides generally obscures views of the site from both nearby and distant viewpoints, public and private. For this reason, the McKay site viewshed is generally limited as there are no publicly accessible areas and roadways adjacent to the perimeter of the site. Therefore, excavation and reclamation areas at the McKay site would not be publicly accessible or visible, and no visual screening, perimeter berms, or landscaping is proposed. Please see Section 5.2.1 below for more detail.

5.2.1 Berms & Screens

As discussed above, the McKay Point property is located in an isolated area and is generally not visible from publicly accessible locations. The only areas within the vicinity of the site that would be potentially accessible to the public are the Kaweah and St. Johns Rivers, which could be used for recreational

purposes. The McKay Point site is set back from the river's banks, and excavation and reclamation of the site would not involve any large above-grade structures that would be clearly visible from the river. Because dry mining techniques would be used during the Project excavation, there would be no need for draglines. Additionally, the majority of reservoir excavation and reclamation activities would occur below grade as mining progresses within the final 60- to 75-feet bgs deep excavation pit, which would further reduce visibility.

For these reasons, no perimeter berms, screening or landscaping is proposed to be installed onsite as part of the excavation or reclamation phases. Additionally, because the proposed end use for the McKay Point site is an excavated basin that would be adapted into a water storage reservoir post-reclamation, revegetation and related topsoil/subsoil storage is not proposed as part of reclamation (see Section 5.6 below).

5.2.2 Fencing

The entire perimeter of the McKay Point Reservoir site would be fenced with 4-foot-high wire fencing. The existing entrance gate located at the northwest corner of the McKay site connecting to the Seaborn facility, as well as the existing Seaborn entrance gate connecting to Road 222, would both be maintained and locked during non-operating hours. Signs would be placed at the access road(s) and as necessary on the perimeter fencing identifying the site as private property (in English and Spanish, as necessary) to prohibit public access. Please see Figure 3 which shows the location of perimeter fencing and entrance gate.

5.2.3 Lighting

Although not anticipated, lighting for nighttime operations and/or security may be provided as needed. If installed, lighting within the McKay Point site would be portable/temporary, and installed in a manner so as to minimize glare onto adjacent properties. The lights would comply with applicable County standards and industry practices. High pressure sodium and/or cut-off fixtures (or equivalent International Dark-Sky Association [IDA]-approved fixtures) would be used instead of mercury-vapor fixtures for any required nighttime lighting. The lighting would also be designed to confine illumination to the site/within the property boundaries and/or to areas that do not include light-sensitive uses.

5.3 Existing Vegetation, CCR §3502 (b)(1), §3503 (c), §3703

As described in Section 3.5, the McKay Point Reservoir site is located immediately north of the divergence of the Kaweah and St. Johns rivers. The site is flat and has been used most recently to support cattle grazing. There are no developed uses on the site (Bumgardner Biological Consulting, 2021).

As described in the Biological Resources Report prepared by BBC (Bumgardner Biological Consulting, 2021), most of the existing onsite vegetation consists of non-native annual grasses [e.g., wild oat (*Avena fatua*)], but also includes herbaceous species such as lamb's-quarters (*Chenopodium album*), wild cucumber (*Marah* sp.), and deer weed (*Acmispon glaber*). Small, scattered stands of mule fat (*Baccharis salicifolia*) also occur within the non-native annual grassland, but these latter stands are not significant enough in size to warrant mapping as a discernible vegetation community (Bumgardner Biological Consulting, 2021).

Mixed oak-riparian woodland occurs in the southeastern portion of the McKay Point site. Woody species that are associated with this stand of vegetation include willows (*Salix* spp.), Fremont's cottonwood

(*Populus fremontii*), western sycamore (*Platanus racemosa*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizeni*). California wild grape (*Vitis californica*) occurs as a liana growing into the canopy of the woody species. The canopy cover in this stand of vegetation varies between approximately 20% and 100% and is best described as interrupted woodland (Bumgardner Biological Consulting, 2021).

Approximately 39.8 acres of elderberry savannah-riparian woodland (a sensitive vegetation community tracked by the CDFW) occurs adjacent to the mixed oak-riparian woodland, but also extends west along the southern border of the site. The dominant species in the elderberry savannah-riparian woodland is blue elderberry. However, scattered Fremont's cottonwoods and willows also occur in this vegetation community. The onsite elderberry shrubs/clumps are large and old with many stems and likely represent the remnants of a formerly more contiguous community (Bumgardner Biological Consulting, 2021). As shown on Figure 2 and Figure 3, onsite excavation and reclamation activities have been designed to not impact this riparian area. See the Biological Resources Reports in Appendix D, prepared by BBC in 2013 and 2021, for additional detail.

5.3.1 Special-Status Plant Species

As discussed in Section 3.5.3, no special-status plant taxa were observed on or immediately adjacent to the McKay Point site during BBC's biological surveys. Additionally, no special-status plant taxa that have been documented in the region are considered to have any potential to occur on the McKay Point site given the onsite conditions (i.e., lack of suitable habitat for and/or known distribution of the species). See the biological resources reports (Bumgardner Biological Consulting, 2021) in Appendix D for more detail.

5.4 Wildlife, CCR §3503 (c), §3703

As described in Section 3.5.2, the biological surveys within and adjacent to the McKay Point site resulted in the documentation of relatively low wildlife diversity (i.e., 2 species of amphibians, 1 species of reptile, 14 species of birds, and 5 species of mammals). Please see the 2013 and 2021 biological resources reports prepared by BBC (Bumgardner Biological Consulting, 2021) in Appendix D for a more detail.

5.4.1 Special-Status Wildlife Species

As discussed in Section 3.5.3, only two (2) special-status wildlife species were observed on the McKay Point site during BBC's surveys. One (1) of these species (i.e., Nuttall's woodpecker) is a likely year-round resident in the mixed oak-riparian woodland in the southeastern portion of the McKay site. The second species (i.e., willow flycatcher) was only observed during the September 18, 2013, survey and is considered a migrant that passes through the area (including the site). Furthermore, this latter species is only considered a special-status species when nesting (typically in dense willow scrub in the Sierra Nevada).

In addition to the two (2) special-status bird species found on the McKay Point site, although not observed directly, BBC determined that various special-status have the potential to occur within the site region. Specifically, sixteen (16) special-status wildlife species (i.e., 3 special-status species of insect, 1 special-Specifically, status species of reptile, 10 special-status species of bird, and 1 special-status species of mammal) that have been documented in the region are considered to have some potential to occur on or near the McKay Point site; however, none of these species were directly observed on or near the site during BBC's various biological resource surveys. See Appendix D for additional detail.

To ensure development (i.e., excavation and reclamation) of the McKay Point site does not adversely impact any special-status wildlife species, BBC recommended mitigation measures which are described in the Environmental Impact Report (EIR) prepared for the project pursuant to the California Environmental Quality Act (CEQA). Specifically, avoidance and minimization measures, including pre-disturbance site surveys, would be implemented to ensure onsite activities would not adversely affect native nesting birds, nesting raptors, western pond turtles, Moestan blister beetle, Morrison's blister beetle, Crotch bumble bee, Tulare cuckoo wasp, and San Joaquin kit fox. Additionally, any fencing installed onsite would be designed to ensure fencing would not injure or impact wildlife in the area. Lastly, the Owners, although the project has been designed to avoid the oak-riparian area to the south of the excavation/reclamation area (see Figure 3), an Oak-Riparian Habitat Management Plan prepare and implement to ensure impacts to that area are prevented. These measures would be implemented during mining (i.e., reservoir excavation) and reclamation activities on the McKay Point site to ensure impacts to wildlife species are avoided. See Appendix D for additional detail.

5.5 Reclamation Specifics & Schedule, CCR §2772 (c)(8)

5.5.1 Reclamation Slopes, CCR §3502 (b)(3), §3704

Once the reservoir excavation is complete (estimated 2044), an open pit with a surface area of approximately 115-acres and a final depth of 60- to 75-feet bgs will remain. The excavation pit walls would have a final slope of 3H:1V (horizontal: vertical). Additionally, the slurry wall installed around the entirety of reservoir pit walls to minimize groundwater intrusion would also remain. The slurry wall would be a permanent fixture, and would remain post-reclamation as an essential feature to maintain dewatered storage space once the reservoir is operation and begins receiving water diversions by the Owners.

As discussed previously, the majority of excavated material would be processed onsite and sold offsite as aggregate products. Once excavation is complete, where required backfilling of the pit would be limited to placement of a nominal quantity of material against the reservoir pit walls to achieve the desired 3H:1V (horizontal: vertical) final slopes, or to facilitate completion of the perimeter access road, which would also remain post-reclamation for use as part of the future reservoir operations. No excess material (e.g., tailings, overburden, sediment, waste rock) would be generated and/or stored within McKay Point site during or following reclamation.

A Geology and Soils Technical Report (SLR, 2021) for the McKay Point Reservoir was prepared by SLR. A copy of the report is provided in Appendix B. As discussed in Section 3.4, SLR completed slope stability analyses of the complete reservoir pit, with either a slurry wall or clay liner installed. SLR's analysis also evaluated the stability of slopes that would be created through backfilling to a final slope condition of 3H:1V, a final depth of 60- to 75-feet bgs. See Figure 3 and Figure 4 above, which show the final reclaimed site conditions, as well as the future design of the reservoir to be constructed post-reclamation, which were prepare by Provost & Pritchard. This represents the final reclaimed landform that would remain post-reclamation.

The static factor of safety of various interim mining slopes as well as the final reclaimed slope(s), both with and without the slurry wall in place, was calculated by SLR within the Geology and Soils Technical Study (SLR, 2021). Factors of Safety were estimated for both static (steady state) and pseudostatic (seismic) conditions.

As stated above, during excavation activities, the desired excavation slopes would generally be targeted to achieve the steepest safe gradient. For most applications, this would be in the range of 1.5H:1V to no

steeper than 1H:1V. Depending on site-specific conditions and the localized variations in the exposed conditions, various measures are then implemented as excavation proceeds. Some of these measures may include varying the slope gradients, using benches, providing additional drainage and dewatering systems, and if needed, installing additional structural support systems. Per SLR's report, a generally acceptable factor of safety value for temporary excavation slopes is of the order of 1.25. See SLR's Geology and Soils Technical Study (SLR, 2021) in Appendix B for additional detail.

Upon completion of excavation, the cut slopes will be backfilled to a permanent gradient of 3H:1V to use the completed excavation pit as a reservoir post-reclamation. Once constructed, the reservoir will be subject to various cycles of filling and emptying. Therefore, SLR's slope stability analysis for the final slopes conservatively took into account steady state, rapid drawdown, and seismic (pseudostatic) conditions, which are described below (also see Appendix B for additional detail):

- **Steady State:** Steady state seepage conditions were incorporated in the model using the groundwater boundary conditions for the final configuration, using the estimated hydraulic conductivities of subsurface layers and the properties of the slurry wall cutoff system.
- **Rapid Drawdown:** The rapid drawdown conditions are applicable when the reservoir is emptied. Emptying the reservoirs is expected to occur over approximately 2 weeks which would allow some of the water pressure in the slope to dissipate. However, the analyses performed conservatively assumed no pressure dissipation, which is an extreme worst-case condition.
- **Pseudostatic:** Seismic slope stability has been evaluated by considering an equivalent horizontal ground acceleration corresponding to a pseudostatic seismic coefficient of 0.1.

The estimated factor of safety for different excavation slope scenarios are summarized in SLR's Geology and Soils Technical Study (SLR, 2021) in Appendix B. SLR found that the factors of safety for each of the permanent reclamation condition scenarios are considered acceptable for the proposed site design features and considered representative of stable slope configurations. Note that all the reclamation slope conditions, including the rapid drawdown factor of safety value, reflect conservative analyses compared to the actual reclaimed conditions, where slopes would be 3H:1V and therefore factors of safety would be higher than those summarized in Appendix B. As such, there is no significant difference in factor of safety values for a 3H:1V slope placed on different reclamation slope gradients. This is as expected since the overall stability of the permanent slope is largely governed by the wedge of compacted fill placed over the temporary excavation slopes. See SLR's full geotechnical report in Appendix B as well as the discussion in Section 3.4 above for more detail.

5.5.2 Reclamation Backfilling, CCR §3502 (b)(4), §3704

As discussed above, once excavation is complete and the basin has reached the target depth of 60- to 75-feet bgs (dependent upon depth to bedrock), the overburden and excess fines resulting from the excavation would be used to backfill the pit walls to achieve the desired 3H:1V (horizontal: vertical) final reservoir slopes. Additionally, minimal quantities of silty/clay fines may be placed on the excavation slopes as needed to complete/stabilize the slurry wall. Design aspects of the proposed reclamation backfilling, specifically to flatten the excavation slopes from 1.5H:1V to 3H:1V, is shown on the figures developed by SLR and presented in Appendix B. Any backfilling conducted as part of reclamation would utilize suitable materials that has both sufficient strength and is relatively free draining, as the final reclaimed slopes would have to remain stable once the reservoir is eventually developed and in operation. Backfilling would be conducted from the bottom up in compacted layers of suitable thickness. Specifically, the slopes would first be benched, and the reservoir slope fill would be keyed into the wedge of native

slope materials in front of the slurry wall. If needed, additional slanted chimney drain zones may be provided while the slope fill is being placed from the bottom up. The figures developed by SLR, and presented in the Geology and Soils Technical Study in Appendix B, shows visual example of the first layer of the backfill being placed along the east side of the excavation. As discussed in Section 5.5.1 above, the reclaimed backfilled slopes would be stable under static and pseudostatic conditions.

As discussed above, the final reclaimed site would remain an excavation pit (110-foot surface area, 60- to 75-foot depth bgs) with a perimeter road (see Figure 3) for future use as water storage reservoir. The reservoir basin and perimeter unpaved roadway would encompass the entirety of the reclaimed McKay Point site. Therefore, based on the reclamation site design and proposed end-use, revegetation of the site would not be feasible. Therefore, topsoil and subsoil removed from the site would not be salvaged, stored, or backfilled as part of site reclamation. The majority of excavated material, including topsoil, subsoil or overburden, would either be used to construct the perimeter access road or be processed onsite and sold offsite as aggregate products. Please see Section 5.9 below for more detail.

5.5.3 Proposed Time Schedule of Reclamation, CCR §2772 (c)(6)

Excavation of the McKay Point Reservoir basin would occur in one (1) phase followed by reclamation. Excavation of the site is estimated to commence in 2024. Assuming excavation commences in 2024, it is estimated that excavation activities at McKay Point would terminate by approximately the end of 2044 (approximate 20-year excavation phase). Other than installation of the slurry wall, which would occur early in the construction phase and remain post-reclamation, or construction of the perimeter access road as needed, concurrent reclamation/stabilization of the site during reservoir excavation activities would not be practical or feasible.

Once excavation of the reservoir basin is complete, the McKay Point site would be reclaimed in a manner consistent with the eventual use as a surface water storage/re-regulation reservoir. Specifically, the final reclaimed end-use of the site would be a basin with a 115-acre excavation footprint, a final depth of 60- to 75-feet bgs, and stabilized side slopes with a 3H:1V gradient. Other ancillary structures such as the perimeter road would also remain post-reclamation. Final site reclamation/stabilization is estimated to take no more than approximately two (2) years to complete following termination of excavation (estimated 2046). Activities complete during this period include formation of final slope conditions/stabilization of landforms (e.g., backfilling), completion of the slurry wall (if not complete), completion of the perimeter roadway, removal of any remaining stockpiles, and removal of mobile and stationary excavation and processing equipment. Once the site is reclaimed, TID would continue to monitor the reclaimed site for up to an additional three (3) years to ensure the site is stable, with final site reclamation monitoring completed in 2049; however, it is the Owner intention to initiate construction as soon as the County has deemed the site reclaimed pursuant to this Reclamation and the provisions of SMARA. Until reclamation is deemed complete, during this period TID would continue to regularly monitor the overall stability of the reservoir pit and perimeter road, as well as the groundwater intrusion rate to ensure the appropriate SMARA success criteria is met. If the groundwater intrusion rate within the reservoir pit exceeds the design criteria of 500 gallons per minute (gpm), TID may implement additional measures to ensure the groundwater intrusion rate remains less than this target. Please see Table 7 below, which summarizes the estimated McKay Point excavation and reclamation schedule.

Table 7: General Project Schedule

Phase/Activity	Approximate Size (Acres)	Anticipated Schedule [1]		Land Use/End Use
		Time Start	Time End	
Reservoir Excavation	115.0	January 2024	January 2044	Excavation Pit / Perimeter Road
Reclamation – Final Site Preparation	130.0	February 2044	February 2046	Empty Dry Basin / Perimeter Road
Reclamation – Final Monitoring	130.0	March 2046	December 2049	Stable Dry Basin / Perimeter Road
Note: Dates and corresponding timeframes shown above are estimations, and may change depending on market demands, etc.				

5.6 Revegetation Plan, CCR §3703 (g), §3705

As discussed above, the proposed reclaimed end use for the McKay Point site would be an excavated pit/basin (approximate 110-foot surface area, 60- to 75-foot depth bgs, 3H:1V [horizontal:vertical]) with a perimeter access road (see Figure 3). The goal is for the basin to be readily adaptable for future use as a water storage reservoir. As shown on Figure 3, the reservoir basin, unpaved perimeter roadway and ancillary structures (e.g., slurry wall, perimeter fencing, etc.) would encompass the entirety of the reclaimed McKay Point site. Therefore, based on the reclamation site design and proposed end-use, and because ultimately the entirety of the site would eventually serve as a water storage basin post-reclamation, revegetation of the site would not be feasible or required per SMARA. Specifically, as discussed in Section 3.4.1, SMARA Section 3705 (Performance Standards for Revegetation) states "revegetation shall be part of the approved plan, unless it is not consistent with the approved end use" (§3705). Because of the reservoir's capacity needs, combined with the various other design criteria required for reservoir construction (i.e., slurry wall, inlet and outlet structures, a perimeter maintenance road and related areas for auxiliary structures/activities), there would be no feasible way to revegetate the site in a manner that meets the SMARA revegetation success criteria, nor would it be beneficial as the site would be developed into a water storage reservoir immediately following cessation of mining/completion of reclamation (i.e., once the reservoir is developed, the majority of the site would be submerged underwater).

For these reasons, a revegetation plan (e.g., test plots, reference areas, seed mixes, success criteria, etc.) in accordance with SMARA Sections 3703 and 3705 has not been prepared as part of this Reclamation Plan. Please see Figure 3 which shows the layout of the final reclaimed reservoir basin and perimeter access road.

5.7 Site Cleanup, CCR §3502 (b)(5)

5.7.1 Building Structure & Equipment Removal, CCR §3709

Other than the excavated reservoir basin, the perimeter access road and other ancillary structures, such as the slurry wall, riprap and perimeter wire fence (see Figure 3), there are no permanent buildings or structures proposed within McKay Point that would remain post-reclamation. Temporary structures and equipment, such as those associated with the proposed processing plant(s), would be dismantled and removed during final reclamation. Any remaining material stockpiles would either used to backfill the excavation slopes to achieve the desired 3H:1V gradient, or removed from the site and sold to local

customers as miscellaneous fill material. No other temporary and/or permanent structures that would require specific reclamation would be installed on the McKay Point site.

Additionally, all mobile equipment (e.g., loaders, dozers, scrappers, water truck, etc.) would be removed following the completion of reclamation activities. Any residual wastes (debris, materials, excess vegetation/overburden, etc.) would also be removed and properly disposed of in accordance with applicable health and safety regulations and/or local ordinances.

5.7.2 Tailing & Mine Waste Management, CCR §3712

As described previously, no mine wastes and/or tailings would be generated by excavation or reclamation operations at the McKay Point site. The majority of the overburden or excess fines generated during excavation would either be used to construct the perimeter access road. The remainder of the unsaleable materials would either be used as backfill against the reservoir pit walls to achieve desired 3H:1V (horizontal: vertical) final slope, or sold as miscellaneous fill material. For example, any excess fines not used as part of onsite reclamation may be sold by WCA as slurry used in nonstructural concrete or as miscellaneous fill material, as WCA has done in the past with overburden and fines resulting from their mining activities. No tailings and/or mine waste would be generated that would require offsite disposal as part of reclamation.

5.7.3 Closure of Surface Openings, CCR §3713

As discussed in Section 4.5, a water production well would be installed in the northern portion of the McKay Point site during site excavation (see Figure 3). The proposed water well is the only surface opening that would require closure and abandonment in accordance with SMARA. Prior to closure, the well head would be fenced off and gated with a lock to ensure members of the public do not inadvertently access the well area. The proposed well would be abandoned in accordance with applicable local and state regulations. No other drill holes, monitoring wells, or other underground workings (e.g., portals, shafts, tunnels, etc.) that would require closure are proposed within the McKay Point site.

5.8 Post-Reclamation & Future Mining, CCR §2772 (c)(7)

As discussed previously, the proposed end use of the final reclaimed McKay Point site would be a stabilized excavation pit/reservoir basin with sufficient capacity to meet the Owners needs for future (i.e., post-reclamation) development of a water storage reservoir. Final reclaimed side-slopes would be 3H:1V (horizontal:vertical), and would therefore exceed the minimum SMARA slope gradient criteria of 2H:1V. Ancillary structures, specifically the perimeter access road and the slurry wall, would also remain post-reclamation, as these would be used as part of the future reservoir.

The reclaimed McKay Point Reservoir would be compatible with adjacent properties, including the existing Seaborn facility to the west and CEMEX's existing Lemon Cove facility to the north. Please see Figure 3 and Figure 4, which displays the final design of the reclaimed McKay Point site.

5.8.1 Impact of Reclamation on Future Mining, CCR §2772 (c)(9)

The proposed end use of the final reclaimed McKay Point site would be an open excavation pit/basin that would be adaptable for future construction of a water storage reservoir post-reclamation. It is expected the development of the reservoir pit/basin would excavate all feasibly accessible aggregate material from the site, as the target basin depth is the underlying bedrock (estimated at 60- to 75-feet bgs). Additionally, it is presumed that future construction of the McKay Point Reservoir would preclude any future mining

on the McKay site. While development of the reservoir itself could eventually prevent future mining on the McKay Point site, reclamation/development of the site would not directly impact future mining onsite or within the adjacent areas (i.e., existing adjacent aggregate operations to the west, north and east).

5.9 Slopes & Slope Treatment, CCR §3502 (b)(3)

5.9.1 Backfilling, Regrading, Slope Stability, and Recontouring, CCR §3704

As discussed in Section 5.5.2 above, once the basin is fully excavated, nominal quantities of remain onsite material would be used as backfill and placed back onto the pit slopes to achieve the final reservoir basin slopes of 3H:1V. As discussed above, during active mining operations, the pit slopes would be over-excavated to a maximum 1H:1V, and then backfilled to the final 3H:1V slope condition during reclamation. Therefore, once excavation is complete, the final reclaimed site would remain a 60- to 75-foot-deep reservoir basin, with 3H:1V side slopes, reinforced by the perimeter slurry wall which would also remain post-reclamation.

In addition to the backfilling described above, minimal regrading/re-contouring of the pit walls may also be required. The reclaimed side slopes would also be stabilized as needed through installation of a supplemental slurry wall liner, in addition to the existing perimeter slurry wall that would be installed early in the excavation phase, which would also prevent groundwater intrusion.

As discussed in Section 5.5.1, as part of the Geology and Soils Technical Study completed by SLR (SLR, 2021), a slope stability analysis was performed for both the proposed excavation and reclamation slope designs. The final reclaimed basin side slopes would not exceed a maximum inclination of 3H:1V, and are therefore presumed to be stable as they exceed the minimum 2H:1V gradient prescribed under SMARA. Nonetheless, SLR performed a detailed slope stability analysis performed (SLR, 2021), the results of which are summarized in this Reclamation Plan. Also see the full Geology and Soils Technical Study in Appendix B for more detail.

Materials Properties

The McKay Point site is essentially flat, sloping gently downward to the south and west. The site is currently undeveloped, so erosion is minimal and there are no obvious slope failures on the McKay Point property. Onsite material properties were characterized by SLR using available subsurface information collected at the site through six (6) borings, performed by BSK Associates in November 2011. These borings provide descriptions of the subsurface strata, which have been generalized into five (5) strata as described below and used in the slope stability modeling(SLR, 2021):

- **Moist Sand:** In the available borings, this light colored, moist, sand layer generally exists from the ground surface down to depths ranging from 7- to 15-feet bgs. It has a typical thickness of 12-feet. It is expected to have little to no cohesion and is expected to be medium-dense. The bottom of this layer is at or slightly above the groundwater levels noted in the borings.
- **Wet Sand, Gravel, Cobbles:** This is a water-bearing layer of olive-gray colored sand, gravel, cobbles, with an approximate thickness ranging from 15- to 25-feet bgs. In the easterly portion of the site, groundwater was noted at the top of or close to the top of this strata. In the easterly portion of the site, groundwater is noted to gradually dip to the mid-depth or slightly below the mid-depth of this layer. This stratum is also expected to have little or no cohesion, but with higher friction angles than the sandy layer above it, due to the presence of gravel and cobbles.

- **Wet Clayey Sand, Gravel, Cobbles:** The top of this yellow-brown to olive-brown, wet, clayey sand, gravel, cobble layer is generally at approximate elevation 430-feet amsl. It rises to an approximate elevation 440-feet amsl near the east end of the site. The thickness of this layer is of the order of 20- to 50-feet, generally increasing to the west, as the underlying bedrock and the dense soil mantle over the bedrock dip down to the west. This layer is expected to have both cohesion due to its clay content, and relatively high friction angle due to its sand, gravel, and cobble components.
- **Dense Silty Clayey Sand:** This layer consists of mixtures of gray, olive-gray, bluish-gray, olive-brown. It is described as moist to dry, indicating that it is a 'tight' formation since it is dry despite being below groundwater. In some zones, the boring logs note hard to very hard drilling. This layer is expected to have a higher strength, with properties of a stiffer cohesive material intermixed with frictional material. This layer generally tends to follow the bedrock surface as a mantle with thickness of 20-feet or more. Towards the west end of the site, bedrock was not encountered at a depth of 90-feet. The thickness of this layer may increase towards the west.
- **Granitic Bedrock:** Dry, granitic bedrock was encountered at its shallowest, at elevation 400-feet amsl or 67-feet bgs in the easterly quadrant of the site. Based on an approximate extension of the bedrock surface profile to the west, the top of bedrock can be estimated to be in the range of 100 to 120 feet bgs, under the westerly portions of the site. Borings in this area did not encounter bedrock withing their maximum exploration depths of 90-feet bgs. For slope stability modeling purposes, bedrock has been assigned a very high strength and is not considered to be an influencing factor in the stability calculations.

In addition to the native materials found onsite described above, the site would incorporate both the slurry wall as well as compacted backfill into the final reclamation design. As such, the following conditions were also accounted for the in the slope stability analysis completed by SLR (see Appendix B):

- **Slurry Wall:** This is expected to be a low-permeability barrier consisting of either a soil-bentonite mix or a soil- cement-bentonite mix, depending on the design details. Two types of walls were conceptually evaluated by SLR as part of their slope stability analyses: one with an approximate equivalent cohesion value of 400 psf, referred to as the 'low strength wall; and another with an approximate equivalent cohesion value of about 2,000 psf, referred to as the 'moderate strength wall'. In practice, an increase in the shear resistance values for the slurry wall would be achieved by adjusting the cement content of the slurry mix.
- **Compacted Backfill:** Backfill to create the 3H to 1V final reclaimed slopes is expected to consist of excavated onsite materials which will likely be a blend of granular and fine materials obtained from the pit. For stability purposes, the excavation slope would also be benched and the backfill material will be placed against the slope in horizontal lifts. The backfill material would generally be compacted to 90% relative compaction. Based on SLR's experience, SLR assumed the compacted fill consisting of a blend of granular and fine materials is assumed to have strength parameters of 200 psf cohesion and 33 degrees friction angle.

See SLR's complete Geology and Soils Technical Study (SLR, 2021) in Appendix B for additional detail related to the onsite materials properties.

Slope Stability & Landslides

Static conditions evaluate long-term open cut excavation slope configurations and pseudo-static conditions evaluate the effect of a seismic event on the open excavation slope configuration. County and SMARA regulations require that static and pseudo-static factors of safety for excavation and fill slopes are suitable for the proposed end use and conform to the surrounding topography and uses (see 14 CCR § 3704(d)).

As discussed in Section 5.5.1, SLR analyzed the slope stability conditions of both the interim excavation slopes (i.e., 1.5H:1V, 1.25H:1V, and 1H:1V) as well as the final reclaimed condition pit/reservoir basin. Conservatively, SLR also assessed the final reclaimed slopes assuming both some level of seepage/intrusion through the slurry wall (i.e., steady state model) as well as future conditions when the reservoir were fully operational (i.e., rapid drawdown model). The results of these models are conservative to when applied to the final reclaimed conditions of the site, as the presumed level of erosion would be far less than if the site were an active reservoir as the final claimed site condition would simply be a dry basin with 3H:1V slopes.

As discussed in Section 5.5.1, the slope stability factor of safety values for each of the permanent condition scenarios are all within their respective acceptable factor of safety values. Additionally, the rapid drawdown factor of safety value, which was also acceptable under static and pseudostatic conditions, reflects a conservative overestimation of the final reclaimed 42conditions and therefore actual reclamation slopes conditions would likely be more stable and therefore acceptable. There is no significant difference in factor of safety values for a 3H:1V slope placed on different excavation slope gradients, as modelled by SLR. This is as expected since the overall stability of the permanent slope is largely governed by the wedge of compacted fill placed over the temporary excavation slopes. Therefore, SLR evaluated the stability of the proposed slopes under the anticipated reclaimed conditions (i.e., reservoir basin/pit), and found them to be acceptable under both static and pseudostatic conditions. See SLR's complete geotechnical report in Appendix B for additional detail.

As discussed previously, a series of slurry walls would be installed around the perimeter of the reservoir pit. Groundwater seepage through the slurry walls into the pit would be designed to ensure a maximum rate of 500 gallons per minute (gpm) is maintained. Due to this design feature, it is anticipated that the slopes during excavation and post-reclamation would be moist near the wall and dry near the open face. Therefore, SLR evaluated the slope stability of the McKay Point site under both moist and dry conditions.

A finite element model analysis was performed by SLR for the case of the slurry wall behind the permanent 3H:1V slope of the reclaimed site. The input for the analysis was based on the geotechnical characteristics of the materials in the excavation area, assessed from available boring logs. For the conditions analyzed, the slurry wall extends from the ground surface behind the top of the outer slope, down to approximately 10-feet below the bottom of the final reclaimed basin/pit, into the low permeability native materials. Taking the slurry wall into account. for the completed basin with 3H:1V slopes and empty condition (i.e., the reclaimed condition), SLR's calculated factor of safety exceeded the generally accepted value of 1.5.

For rapid drawdown conditions, which represents emptying of the reservoir without allowing adequate time for dissipation of water from the soil within the slope, SLR determined the factor of safety exceeds the generally accepted values which range from 1.25 to 1.40. For pseudostatic (seismic) conditions, the factor of safety also exceeds the generally accepted value of 1.1. Therefore, based upon SLR's analysis, results show that the proposed slopes are sufficiently stable, including during earthquake conditions. The

slope and slurry wall deformation analyses that demonstrate that the slopes and slurry wall deformations would be tolerable with adequate safety. See Appendix B for a full copy of SLR's slope stability analysis.

In summary, based on the slope stability calculations presented above, reclaimed slopes at the McKay Point site do not exceed factors of safety criteria under anticipated operational conditions. As such, it was determined the McKay Point site would be stable and safe as designed. In addition, the relatively massive alluvial deposits have a low susceptibility to block land-sliding or lateral spreading due to the lack of geologic structures such as joints, contacts, and bedding, which may present preferred shear surfaces. See the Geology and Soils Technical Study presented in Appendix B, as well as the discussion in Section 5.5.1 above, for additional details.

5.10 Ponds, Reservoirs, Tailings & Mine Waste Management, CCR §3706, §3712

Other than small settling basins used to store fines from the aggregates plant, no ponds, tailings, or mine waste basins or impoundments would be present within the McKay Point Reservoir site during reservoir excavation or post-reclamation. As previously noted, during reclamation water in the settling basins will be allowed to naturally infiltrate and evaporate. Other deleterious materials including fines as previously discussed and overburden will be placed onto the pit walls as needed for backfill. Additionally, no dams, embankments, or foundations would be present onsite. For these reasons, excavation and reclamation activities on the McKay Point site would not result in any disposals or discharges of mine waste subject to Article 1, Subchapter 1, Chapter 7 of Title 27, California Code of Regulations.

5.11 Soil & Fine Textured Waste

Please see Section 3.1, which describes the site geology and soils found within the McKay Point site. The following section describes how topsoil and other fine soils would be managed as part of site reclamation.

5.11.1 Topsoil Salvage, Maintenance, & Redistribution, CCR §3711

As discussed in Section 5.6, revegetation or cultivation of the land disturbed by the development of the McKay Point excavation operations would not be compatible with the proposed reclamation end use, which would be an empty basin/pit that would be readily adaptable into a future water storage reservoir post-reclamation. As discussed previously, prior to the initiation of onsite mining, topsoil and subsoil removed from the site in a single layer and would be stored within the perimeter of the site, specifically utilized to construct the perimeter access road, which would remain post-reclamation. Any excess fines may also be sold by WCA as slurry used in nonstructural concrete or as miscellaneous fill material, or moved to WCA's other permitted sites in Tulare County to support reclamation objectives, consistent with their existing operations/protocols at other excavation site within the local area. Additionally, after final grading of the excavation pit/basin during reclamation, minimal quantities of topsoil and subsoil may also be redistributed along pit slopes to help facilitate stabilization and ensure the basin slopes do not exceed the required 3H:1V design gradient, which would remain post-reclamation. If excess topsoil or subsoil remains once the final reclamation landform is achieved at the McKay Point site, WCA may also transport excess fines and topsoil to their other permitted facilities throughout the region to support reclamation objectives at those sites.

5.12 Drainage & Erosion Controls

5.12.1 Drainage, Diversion Structures, Waterways & Erosion Control, CCR §3706

As discussed previously, the Owner's objective is to develop a dry excavation pit/basin that would be readily adaptable into a water storage reservoir. A Hydrology and Water Quality Technical Study was prepared by SLR and is provided in Appendix C. Additionally, a SWPPP which outlines site-specific erosion controls and water quality BMPs, would be prepared prior to initiation of reservoir excavation.

The proposed surface mining and reclamation activities have been designed to protect onsite and downstream beneficial water uses, and would be conducted in accordance with the Porter-Cologne Water Quality Control Act, Section 13000 et seq. of the State Water Code, and the Federal Clean Act, 33 U.S.C §1251, et seq. As discussed in Section 4.6 above, reservoir excavation/reclamation activities would be subject to the Industrial General Permit (IGP). Therefore, prior to commencement of mining/excavation, a site-specific SWPPP would be prepared that complies with the IGP. The SWPPP would include the following: specific prohibitions, effluent limitations, source identification, practices to reduce pollutants, assessment of pollutant sources, materials inventory, preventative maintenance program, spill prevention and response procedures, general storm water BMPs, training, record keeping, sampling procedures and a description of the monitoring program. Additionally, the SWPPP is considered a living document, and would be updated as needed to address changing conditions on the site. Measures implemented per the SWPPP would ensure surface mining and reclamation activities do not impact nearby surface waters, specifically the Lower Kaweah River and St. Johns River located to the south of the McKay site.

During reservoir excavation, and as necessary during and/or post-reclamation, energy dissipaters would be installed, such as sediment catchment basins or sumps, rock dams, and berms. These would serve to reduce erosion, trap sediment, and minimize the potential for erosions, sedimentation, and off-site transport of pollutants. As discussed above, BMPs (e.g., berms, silt fences, other erosion control measures, etc.) outlined within the SWPPP would be implemented through our excavation and reclamation to minimize erosions and offsite discharge during storm events. Additionally, the perimeter road would be graded to direct runoff into the reservoir pit or onsite detention areas (i.e., infiltration galleries) instead of toward the adjacent Lower Kaweah and St. John Rivers.

As discussed in Section 3.2.2, the existing McKay site has no natural surface waters, including drainages, streams or lakes, that would be covered, restricted, rerouted, or otherwise impact due to excavation and reclamation activities at the McKay Point site. Specifically, this Reclamation Plan covers the excavation of the reservoir pit (i.e., surface mining) and stabilization of the reservoir basin (i.e., reclamation) for future development of a water storage reservoir. Construction and operation of the reservoir itself, which would potentially occur in the future and would involve diversion of the adjacent Lower Kaweah and St. John Rivers, construction of any future reservoir structures is not subject to SMARA and is therefore not covered within this Reclamation Plan.

5.12.2 Stream Protection, Including Surface Water, & Groundwater, CCR §3710

A Hydrology and Water Quality Technical Study was prepared by SLR (SLR, 2022) and is provided in the Appendix C. SLR's study concluded that excavation and reclamation activities within the McKay Point site would not have significant impacts on surface or groundwater quality.

The site-specific SWPPP to be prepared prior to excavation and reclamation operations, would outline BMPs and the methods and means for onsite protection of surface water and groundwater quality.

Approved BMPs to protect the surface water quality of areas surrounding McKay Point Project site will be identified in the site-specific SWPPP, which will be prepared and submitted to the Water Board for approval prior to onsite operations. Additionally, per the Hydrology and Water Quality Technical Study (Appendix C), mining and reclamation activities within the McKay site would not directly encroach into the adjacent Kaweah and St. Johns River waterways or existing floodplain(s). The approved BMPs that will be identified in the SWPPP, as well as those BMP's outlined in the Hydrogeology and Water Quality Technical Study in Appendix C, would be implemented at the Project site to prevent runoff and control erosion that could impact nearby surface waters (i.e., Kaweah River, St. Johns River).

Other agencies would be consulted prior to initiating activities that may require additional permits or authorization.

As discussed previously, groundwater is expected to occur at depths below 7- to 12-feet bgs. The final reservoir depth of excavation is anticipated to be 60- to 75-feet bgs; therefore, dewatering of the excavation pits may be required. However, once the slurry wall is installed around the perimeter of the reservoir basin, which would occur early in the excavation phase of the project, dewatering using pumps would not be required so long as into the basin are limited to approximately 500 gpm. The slurry wall would be a permanent fixture of the McKay site and would serve as an essential feature to maintain a dewatered basin post-reclamation. The slurry wall would be maintained to ensure that both onsite excavation and reclamation activities do not adversely affect local groundwater.

5.13 Public Health & Safety, CCR §3502 (b)(2)

As discussed previously, vehicles would access the McKay Point site using the existing access road in the northwest corner of the site (see Figure 3), which connects to the adjacent Seaborn facility. This access point would serve as the single ingress and egress point for all haul trucks, employees and other work vehicles, which includes small work trucks, and employee/visitor passenger vehicles. A security gate with required signage would be located on the access road at the boundary of the McKay site, and would be locked during non-working hours.

Public access to both the existing Seaborn facility and McKay Point site would also be restricted with perimeter fencing and the existing locked entrance gates, including the existing entrance gate along Road 222. The gates would have signs reading "NO TRESPASSING." The 4-foot-high perimeter fence and gates would restrict access to foot traffic and motor vehicles from the public roads, and would remain in place during mining and post-reclamation reclamation activities.

Mining and reclamation activities would comply with all Federal Mine Safety and Health Administration (MSHA) and State Occupational Safety and health Administration (OSHA) mine safety regulations concerning operating standards and operation of equipment.

Workers, including contract labor, would be trained in mine safety and first aid. Refresher courses would be conducted periodically in accordance with applicable regulations.

Site operators would carry portable cellular phones for offsite communication. All visitors, outside vendors, and truck drivers would be required to check-in and check-out with the site manager before entering or leaving the McKay Point site. Conditions affecting safety would be continually monitored by onsite operations personnel.

The McKay Point site is private property. During excavation and reclamation operations, as well as post-reclamation once the site is stabilized, the general public would not be admitted to these lands without prior permission of the Owners and/or onsite manager.

When mining has concluded and reclamation is complete, there would be no open shafts or any hazardous materials associated with the mining operations remaining on the reclaimed lands.

5.13.1 Control of Potential Contaminants & Non-Marketable Material, CCR §2772 (c)(8)

As discussed previously, other than nominal quantities of fuels and greases for the fueling/servicing of mobile equipment, the excavation and reclamation activities would not require the transport, storage, use, and/or disposal of hazardous materials. During excavation, onsite fuels would be temporarily stored within a portable 4,000-gallon diesel tank. Fuel and/or lubricant spills could result in the accidental release of hazardous materials into the environment; however, the Owners/WCA would ensure fuel storage utilizes appropriate secondary containment, and spill kits would be maintained onsite at all times. The use, storage, transport, and disposal of hazardous materials would be done in strict accordance with Federal, State, and County laws, ordinances, and regulations, including but not limited to hazardous waste generator requirements as well as provisions outlined within the site-specific SWPPP. BMPs identified in the SWPPP would be implemented to minimize erosion and the transport of sediment.

As discussed previously, overburden/soil and excess fines generated during reservoir excavation would be managed onsite. Non-marketable material would primarily be utilized to construct/maintain the perimeter access road, which would remain post-reclamation. Excess fines may also be used as backfill to complete the slurry wall and/or to ensure the pit walls maintain the desired 3H:1V slope. The remainder of the fines could be sold as miscellaneous fill material. Specifically, excess fines may also be sold by WCA as slurry used in nonstructural concrete or as miscellaneous fill material, as WCA has done in the past with overburden and fines resulting from their mining activities.

5.14 Monitoring, Maintenance, & Reporting

Performance monitoring would include both qualitative and quantitative assessment. Qualitative monitoring would occur during periodic inspections of the full McKay Point site/reclamation areas. These inspections would be conducted by the onsite reclamation specialist, and would generally occur more frequently (approximately every month) during the first year of reclamation, and less often in subsequent years. Quantitative monitoring would typically occur annually, beginning during the first year of reclamation following excavation (i.e., estimated to commence in 2044). Reclamation inspection data would be provided to the County upon request.

5.14.1 Reclamation Monitoring

Qualitative monitoring methods used by the onsite reclamation specialist would include visual observation and photo documentation. There are no specific performance criteria associated with this monitoring.

During annual monitoring events required under SMARA, the SMARA inspector would document the conditions and potential issues (i.e., vandalism, fence damage, slope failures, erosion, etc.), and recommended actions would be documented in a field memo. Copies of all field memos would be included in each year's annual SMARA report, which would be submitted to the County for review.

Annual photographs of revegetation areas would be taken from preset photo stations during data collection events. Additional photographs would be taken of any potential problem areas. All photographs would be logged and included in each annual report.

As noted previously, because the reclaimed site would be a dry basin, perimeter road, and slurry wall that could be readily adaptable for future use as a water storage reservoir, revegetation of the site would be incompatible with the proposed end-use. Because revegetation would not be implemented onsite during reclamation, quantitative monitoring of revegetation success would also not be required. Nonetheless, both the Owners and the County would conduct annual inspections, and the results of ongoing site reclamation would be reviewed annually to ensure the site remains in a stable/clean condition, and that applicable SMARA standards/success criteria continue to be met.

5.14.2 Annual Monitoring Reports

Annual monitoring reports would be prepared that include a summary of the reclamation efforts, site conditions, any issues encountered, evaluation of the data collected and success achieved, and recommendations for meeting the SMARA performance criteria. Reports would be prepared and submitted to the County annually for review and approval.

5.15 Reclamation Assurance, CCR §2773.1 (a)

A detailed Financial Assurance Cost Estimate (FACE) would be prepared prior to commencement of operations at the McKay Point site. Per SMARA requirements, the FACE would include detailed descriptions and spreadsheets estimating the cost for reclamation of the site to the specifications established in this Reclamation Plan.

A performance bond payable to the County and, in the alternative, the California Department of Conservation (DOC), Division of Mine Reclamation (OMR), would be provided to the County in the amount of the estimated cost of reclamation. Alternatively, if provided for by future regulations, other forms of equivalent surety may be substituted.

Please see Section 8.0 below for more detail.

6.0 OTHER SMARA RECLAMATION STANDARDS

6.1 Protection of Fish and Wildlife Habitat, CCR §3503(c)

As discussed in Sections 3.5 and 5.4, a biological resources surveys were performed by BBC in 2013 and 2021 (Bumgardner Biological Consulting, 2021). Please see the previous sections, as well as the biological resource reports prepared by BBC (Appendix D) for more detail.

As discussed previously, much of the onsite vegetation consists of nonnative annual grassland. No special-status plant taxa were observed on or immediately adjacent to the McKay Point site during the surveys. Additionally, no special-status plant taxa that have been documented in the region are considered to have any potential to occur on the McKay Point site given the onsite conditions (i.e., lack of suitable habitat for and/or known distribution of the species).

As discussed previously, approximately 39.8 acres of elderberry savannah-riparian woodland (a sensitive vegetation community tracked by the California Department of Fish and Wildlife [CDFW]) occurs adjacent to the mixed oak-riparian woodland, but also extends west along the southern border of the McKay Point site; however, as shown on Figure 1 through Figure 3, excavation and reclamation activities on the McKay Point site has been designed to avoid this area, and would therefore not impact this riparian area as this riparian area is located outside the areas of disturbance.

As discussed in Section 3.5.3, only two (2) special-status wildlife species were observed on the McKay Point site during the surveys. One of these species (i.e., Nuttall's woodpecker) is a likely year-round resident in the mixed oak-riparian woodland in the southeastern portion of the project site. The second species (i.e., willow flycatcher) was only observed during the September 18, 2013 survey and is considered a migrant that passes through the area (including the McKay site). Furthermore, this latter species is only considered a special-status species when nesting (typically in dense willow scrub in the Sierra Nevada). Although not observed onsite, BBC determined that one (1) special-status reptile, ten (10) special-status birds, and one (1) special-status mammal have the potential to occur on the McKay Point site.

As discussed in Section 5.4.1, BBC recommend mitigation measures to ensure development of the McKay Point Reservoir does not adversely impact any special-status wildlife species. Specific measures would be implemented during excavation and reclamation activities including avoidance and minimization measures related to nesting birds, preconstruction surveys, installation of exclusionary fencing, etc. The biological resources report in Appendix D provides a detailed discussion of the wildlife and the CEQA EIR identifies the wildlife protection measures, which were developed by BBC, to be implemented onsite.

6.1.1 Wildlife Habitat

SMARA requires that "wildlife habitat shall be established on disturbed land in a condition at least as good as that which existed before the lands were disturbed by surface mining operations, unless the proposed end use precludes its use as wildlife habitat or the approved reclamation plan establishes a different habitat type than that which existed prior to mining" (SMARA §3703(c)). Because the entirety of the reclaimed site would remain a dray basin with a perimeter access road/slurry wall to be adapted into a future water storage reservoir, revegetation and reestablishment of habitat similar to existing conditions would not be feasible or preferable, as entirety of the site would be underwater in the future.

Additionally, as discussed previously, the existing habitat consists of nonnative annual grassland that has been disturbed by historical cattle grazing, and is not of local or regional importance. The project has also

been designed to completely avoid elderberry savannah-riparian woodland located to the south of the area pf disturbance. For these reasons, development of the site would not eliminate any existing habitat designated as sensitive or special-status per the County of CDFW.

6.1.2 Wetlands

As discussed in BBC's reports (Appendix D), wetlands or other waters of the United States are identified based on three (3) criteria:

(1) Soil characteristics;
(2) Hydrology; and
(3) Plant species.

The U.S. Army Corps of Engineers (USACE) has developed a procedure and manual for delineating wetlands that requires comprehensive evaluation of these three criteria during field environmental assessments. No waters that are subject to the jurisdiction of the USACE, CDFW, or Regional Water Quality Control Board (RWQCB) occur on the McKay Point site. While the Kaweah and St. Johns Rivers, which occur on or immediately adjacent to the site, are jurisdictional waters, as discussed previously the excavation and reclamation within the McKay Point site would not impact these waterbodies. Please see Figure 1 through Figure 3, which show the design and footprint of the excavation and reclamation areas, which are outside the jurisdictional waters.

6.2 Prime Agricultural Land Reclamation, CCR §3707

Per the California Department of Conservation's Farmland Mapping and Monitoring Program, the proposed McKay Point site is not located within Prime Agricultural land.

The California Resources Agency, Division of Land Resource Protection maintains information pertaining to, and the mapping of, farmland. The entire McKay Point site is designated as Vacant or Disturbed Land, which, among other definitions, includes "open field areas that do not qualify for an agricultural category." Historically, the site has experienced only marginal agricultural use in the form of seasonal livestock grazing. As such, excavation and reclamation activities on the McKay Point site would have no impact on any category of important farmland.

6.3 Other Agricultural Land Reclamation, CCR §3708

The reclaimed McKay site would be a stabilized excavation pit/basin suitable and adaptable for future development of a water storage reservoir. There are no agricultural uses proposed, nor would any be feasible, post-reclamation.

6.4 Other Lead Agency Requirements, CCR §2772(c)(11)

In addition to the SMARA requirements addressed in this Reclamation Plan, the following Tulare County zoning/land use requirements and California Environmental Quality Act (CEQA) requirements are applicable to the McKay Point site:

- Tulare County Ordinance Code, Part VII, Chapter 25 – Surface Mining and Reclamation (Tulare County).
- Tulare County General Plan 2030 Update (Tulare County, 2012).
- CEQA Appendix G Environmental Checklist and subsequent CEQA documents.

7.0 STATEMENT OF RESPONSIBILITY, CCR §2772(C)(10)

As required by Public Resources Code §2772 (c)(10), the owner and operator accept responsibility for reclaiming the mined lands in accordance with the provisions of this Reclamation Plan.

I, the undersigned, hereby acknowledge that all of the provisions of said permit and reclamation plan, and any and all conditions appended thereto will be faithfully performed and completed within the time therein provided, or within any additional time as may be allowed pursuant to the Surface Mining Ordinance Code of the lead agency and with the applicable requirements of Articles 1 and 9 (commencing with section 3500 et seq., respectively) of Chapter 8, Division 2, Title 14, of the California Code of Regulations, the Surface Mining and Reclamation Act of 1975 (SMARA), as amended (Section 2710 et seq. of the Public Resources Code) which are incorporated herein by reference.

I, the undersigned, hereby agree to perform and complete the provisions of said permit and/or plan, including any and all conditions appended thereto, shall be subject to the provisions of said Ordinance Code and SMARA and the State Mining and Geology Board's implementing regulations and guidelines.

That the place of performance by the undersigned of the covenants herein, shall be the area managed by the lead agency in the State of California.

That, pursuant to Public Resources Code section 2774.1 (a) notice procedures, any notice required to be given, or otherwise given to the undersigned may be by personal service or by certified mail.

Signature _____

Name _____

Signed this _____ day of _____, 20_____

8.0 FINANCIAL ASSURANCES, CCR §2773.1 (A)

A Financial Assurance Cost Estimate (FACE) would be prepared for the McKay Point Reservoir site and this Reclamation Plan. This FACE would be reviewed annually and updated accordingly.

9.0 REFERENCES

BSK Associates. (2011). *Geotechnical Engineering Investigation Report.* Bakersfield, CA: BSK Associates.

Bumgardner Biological Consulting. (2021). *Biological Resources Report.* Gold River, CA: Bumgardner Biological Consulting.

Department of Conservation. (1997). *Mineral Land Classification of Concrete Aggregate Resources in the Tulare County Production-Consumption Region, California.* Sacramento, CA: Division of Mines and Geology. Retrieved from https://filerequest.conservation.ca.gov/?q=OFR_97-01_Text.pdf

Department of Conservation. (n.d.). *Surface Mining and Reclamation Act (SMARA).* Sacramento, CA: Department of Conservation. Retrieved from https://www.conservation.ca.gov/dmr/lawsandregulations

Greater Kaweah Groundwater Sustainability Agency. (2020). *Groundwater Sustainability Plan.* Greater Kaweah Groundwater Sustainability Agency. Retrieved from http://greaterkaweahgsa.org/resources/groundwater-sustainability-plan/

SLR. (2021). *Geology and Soils Technical Study.* Irvine, CA: SLR.

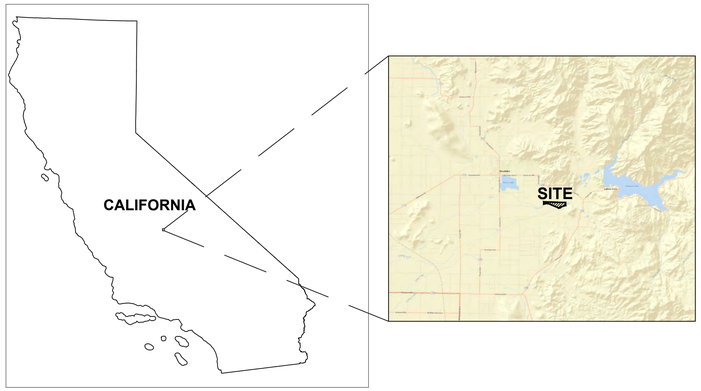
SLR. (2022). *Hydrology and Water Quality Technical Study.* Irvine, CA: SLR.

Tulare County. (2012). *Tulare County General Plan - 2030 Update.* Resource Management Agency. Visalia, CA: Tulare County. Retrieved from http://generalplan.co.tulare.ca.us/

Tulare County. (n.d.). *Ordinance Code Part VII, Chapter 25 - Surface Mining and Reclamation.* Visalia, CA: Tulare County. Retrieved from https://tularecounty.ca.gov/rma/index.cfm/rma-documents/planning-documents/portions-of-the-ordinance-code-of-tulare-county/part-vii-chapter-25-surface-mining-and-reclamation/

APPENDIX A

Figures (Large-Sized)



INDEX MAP
NOT TO SCALE

SHEET INDEX

FIGURE 1:	**SITE OVERVIEW**
FIGURE 2:	MINING PLAN
FIGURE 3:	RECLAMATION PLAN
FIGURE 4:	CROSS SECTIONS

LEGEND:

- PROPERTY BOUNDARY
- PROPERTY LINES
- EXISTING TOPOGRAPHY
- RECLAMATION PLAN BOUNDARY
- LIMIT OF MINING
- PERIMETER FENCE
- SLURRY WALL
- INFILTRATION TRENCH
- PERIMETER ROAD

GEOLOGIC DESCRIPTION

GEOLOGIC SETTING

THE MCKAY POINT SITE IS LOCATED IN CALIFORNIA'S CENTRAL VALLEY, NEAR THE WESTERN BOUNDARY IN THE LOW FOOTHILLS OF THE SIERRA NEVADA GEOMORPHIC PROVINCE OF CALIFORNIA. THE SOUTHERN SAN JOAQUIN VALLEY BOUNDS THIS PART OF THE SIERRA NEVADA TO THE WEST AND THE GREAT BASIN TO THE EAST. THE FOLLOWING EXCERPTS FROM THE GEOLOGY AND SOILS TECHNICAL STUDY (SLR CONSULTING, DECEMBER 2021) PROVIDE A BRIEF SUMMARY OF THE REGIONAL AND SITE GEOLOGIC SETTING. SEE ALSO SECTION 3.1 OF THE RECLAMATION PLAN AND THE COMPLETE SLR CONSULTING REPORT IN RECLAMATION PLAN APPENDIX A.

REGIONAL GEOLOGY

THE MCKAY POINT SITE IS LOCATED IN THE SAN JOAQUIN VALLEY, WHICH IS THE SOUTHERN PORTION OF THE CENTRAL VALLEY OF CALIFORNIA. THE CENTRAL VALLEY FORMED BY MILLIONS OF YEARS OF DEPOSITION OF QUATERNARY SEDIMENTS DERIVED FROM THE UPLIFTED SIERRA NEVADA AND COAST RANGES, WHICH BOUND THE CENTRAL VALLEY ON ITS EAST AND WEST. THE CENTRAL VALLEY IS AN ALLUVIAL PLAIN APPROXIMATELY 50 MILES WIDE AND 400 MILES LONG (NORTH TO SOUTH). SEDIMENTS HAVE BEEN DEPOSITED INTO THE CENTRAL VALLEY FOR THE LAST 160 MILLION YEARS, AND CAN BE THOUSANDS OF FEET THICK IN CERTAIN AREAS.

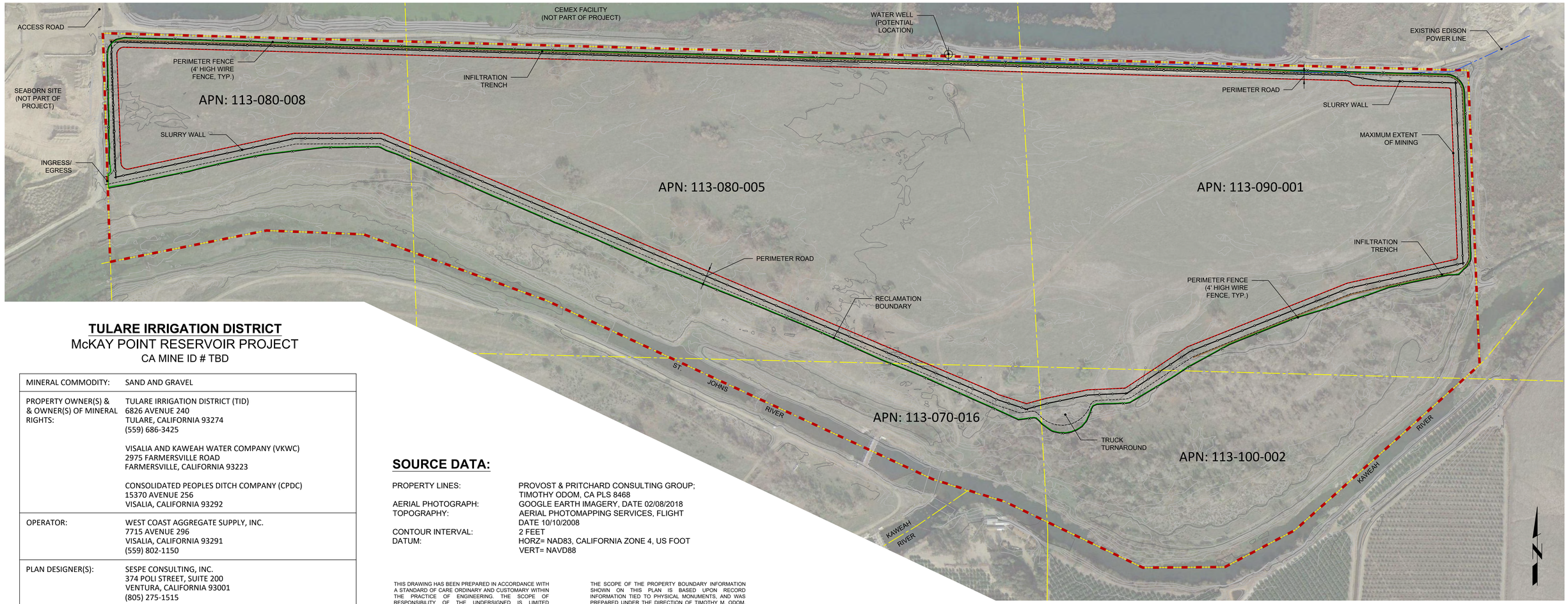
NUMEROUS RIVERS AND STREAMS ORIGINATING IN THE HIGHER ELEVATIONS OF THE SIERRA NEVADA, INCLUDING THE KAWEAH RIVER, FLOW WESTWARD INTO THE CENTRAL VALLEY, DEPOSITING QUATERNARY ALLUVIAL SEDIMENTS UPON WHICH THE SITE IS LOCATED. THIS ALLUVIUM IS UNDERLAIN BY A SEQUENCE OF MARINE AND CONTINENTAL SEDIMENTARY ROCKS CONSISTING OF SHALE, SILTSTONE, SANDSTONE, AND LOCALLY GRANITIC ROCK UNDERLYING THE ALLUVIUM AT THE SITE. BENEATH THESE ROCKS LIES AN IMPERMEABLE BASEMENT COMPLEX OF IGNEOUS AND METAMORPHIC ROCKS THAT EXTEND AS DEEP AS 13,000-FEET BELOW GROUND SURFACE (BGS). THESE BASEMENT ROCKS ARE A SUBSURFACE EXTENSION OF THE SAME ROCKS THAT OCCUR IN THE SIERRA NEVADA.

SITE GEOLOGY

THE MCKAY POINT SITE IS AT AN ELEVATION OF APPROXIMATELY 460- TO 470-FEET ABOVE MEAN SEAL LEVEL (AMSL) AND IS LOCATED IN THE EASTERN PORTION OF KAWEAH SUB-BASIN OF THE SAN JOAQUIN VALLEY GROUNDWATER BASIN. THIS AREA IS UNDERLAIN BY YOUNG UNCONSOLIDATED ALLUVIAL DEPOSITS (SANDS AND GRAVELS) FROM THE NEARBY SIERRA-NEVADA MOUNTAINS. THESE MODERATELY TO HIGHLY PERMEABLE SANDS AND GRAVELS EXTEND TO DEPTHS OF SEVERAL HUNDRED FEET OR MORE. THE SITE VICINITY IS DRAINED BY THE KAWEAH RIVER AND ST. JOHNS RIVERS, WHICH DEPOSITED THESE SEDIMENTS.

THE SURFACE SOIL AT THE MCKAY POINT SITE PRIMARILY CONSISTS OF LOOSE, MEDIUM GRAINED SAND WITH OCCASIONAL GRAVEL AND COBBLES. THE THICKNESS OF FLUVIAL SEDIMENTS AT THE SITE RANGES BETWEEN APPROXIMATELY 40- AND 100-FEET BGS. ALLUVIAL DEPOSITS AT THE MCKAY POINT SITE CONSIST OF SAND THAT IS ABOUT 15- TO 20-FEET THICK. COBBLES, BOULDERS WITH SAND, CLAY AND SILT ARE COMMON BELOW THIS SAND INTERVAL. THESE DEPOSITS EXTENDED TO A DEPTH OF ABOUT 40-FEET BGS ON THE EASTERN PORTION OF THE SITE, AND TO ABOUT 100-FEET BGS ON THE WESTERN. THE BEDROCK ENCOUNTERED IS LIKELY MESOZOIC GRANITIC ROCKS OF THE SIERRA-NEVADA BATHOLITH, WHICH HAS BEEN MAPPED AS OUTCROPS AT HIGHER ELEVATIONS WITHIN ABOUT A MILE TO THE NORTH, EAST, AND SOUTH OF SITE. THE SURROUNDING HILL AND OUTCROP FEATURES SUGGEST BEDROCK COULD GET DEEPER TO THE WEST AND SOUTHWEST, TOWARDS THE VALLEY. AVAILABLE BORINGS ENCOUNTERED BEDROCK IN THE EASTERLY PORTION OF THE SITE AT APPROXIMATELY 77-FEET BGS. IN THE WESTERLY PORTION OF THE SITE, BEDROCK WAS NOT ENCOUNTERED WITHIN THE EXPLORED DEPTHS OF ABOUT 90-FEET BGS, INDICATING IT WOULD BE DEEPER THAN THAT.

WEATHERED OR DECOMPOSED BEDROCK ZONES AND SOME DISCONTINUOUS INTRUSIONS OF CLAY OR CLAYEY SAND MAY ALSO EXIST. THERE IS AN APPROXIMATE 10- TO 15-FOOT-THICK MANTLE OF VERY DENSE SILTY, CLAYEY SAND OVERLYING THE BEDROCK. THIS LAYER GENERALLY FOLLOWS THE TOP OF ROCK, LIKEWISE DIPPING DOWN TO THE WEST. BOTH THE BEDROCK AND THE OVERLYING MANTLE OF VERY DENSE SOILS ARE EXPECTED TO BE LESS PERVIOUS THAN THE OVERLYING ALLUVIAL MATERIALS AND THEREFORE PROVIDE A GOOD OPPORTUNITY TO KEY-IN A SLURRY WALL TO ACHIEVE THE DESIRED HYDRAULIC BARRIER.



TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

MINERAL COMMODITY:	SAND AND GRAVEL
PROPERTY OWNER(S) & & OWNER(S) OF MINERAL RIGHTS:	TULARE IRRIGATION DISTRICT (TID) 6826 AVENUE 240 TULARE, CALIFORNIA 93274 (559) 686-3425 VISALIA AND KAWEAH WATER COMPANY (VKWC) 2975 FARMERSVILLE ROAD FARMERSVILLE, CALIFORNIA 93223 CONSOLIDATED PEOPLES DITCH COMPANY (CPDC) 15370 AVENUE 256 VISALIA, CALIFORNIA 93292
OPERATOR:	WEST COAST AGGREGATE SUPPLY, INC. 7715 AVENUE 296 VISALIA, CALIFORNIA 93291 (559) 802-1150
PLAN DESIGNER(S):	SESPE CONSULTING, INC. 374 POLI STREET, SUITE 200 VENTURA, CALIFORNIA 93001 (805) 275-1515 PROVOST & PRITCHARD CONSULTING GROUP 130 NORTH GARDEN STREET VISALIA, CALIFORNIA 93291 (559) 636-1166
LEAD AGENCY:	TULARE COUNTY RESOURCE MANAGEMENT AGENCY 5961 SOUTH MOONEY BOULEVARD VISALIA, CALIFORNIA 93277 (559) 624-7000

SOURCE DATA:

PROPERTY LINES:	PROVOST & PRITCHARD CONSULTING GROUP; TIMOTHY ODOM, CA PLS 8468
AERIAL PHOTOGRAPH:	GOOGLE EARTH IMAGERY, DATE 02/08/2018
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
CONTOUR INTERVAL:	2 FEET
DATUM:	HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88

THIS DRAWING HAS BEEN PREPARED IN ACCORDANCE WITH A STANDARD OF CARE ORDINARY AND CUSTOMARY WITHIN THE PRACTICE OF ENGINEERING. THE SCOPE OF RESPONSIBILITY OF THE UNDERSIGNED IS LIMITED SPECIFICALLY TO THE AREA OF PRACTICE OF CIVIL ENGINEERING DEFINED IN THE CALIFORNIA PROFESSIONAL ENGINEERS ACT.

REGISTERED PROFESSIONAL ENGINEER · A. PEARCE SWERDFEGER · NO. C87466 · CIVIL · STATE OF CALIFORNIA

A. PEARCE SWERDFEGER R.C.E. 87466 EXP. 09-30-2023

THE SCOPE OF THE PROPERTY BOUNDARY INFORMATION SHOWN ON THIS PLAN IS BASED UPON RECORD INFORMATION TIED TO PHYSICAL MONUMENTS, AND WAS PREPARED UNDER THE DIRECTION OF TIMOTHY M. ODOM, PLS 8468.

PROFESSIONAL LAND SURVEYOR · TIMOTHY M. ODOM · No. 8468 · STATE OF CALIFORNIA

TIMOTHY M. ODOM P.L.S. 8468 EXP. 12-31-2024

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SCALE IN FEET
SCALE: 1" = 200'
SCALE INDICATED IS BASED ON A
24" X 36" FORMAT PRINT

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374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

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LAND USE CONSULTANT
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VENTURA, CALIFORNIA 93001
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REVISIONS

MARK	DATE	DESCRIPTION	BY
	06/15/23	INITIAL DRAFT	GJC

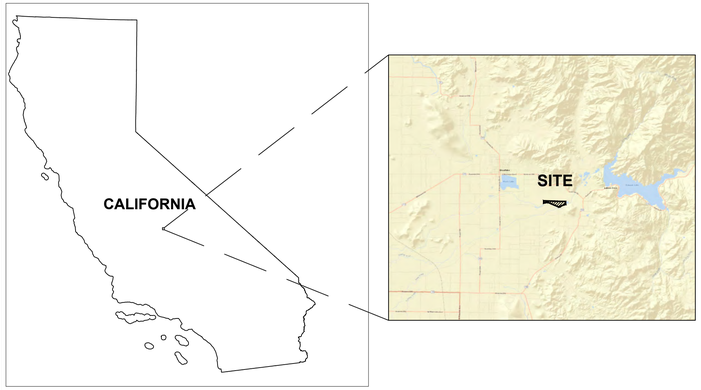
REVIEWED BY:
DATE
DATE

TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
SITE OVERVIEW

SCALE: HORIZ. AS SHOWN
VERT. AS SHOWN
DRAWN BY: G. CAMUS
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FIGURE 1

Plot Date: C:\Users\Pearce.Swerdfeger\Trinity Consultants, Inc\Tulare Irrigation – Documents\CA Tulare County\08 Reclamation Plan\CAD\TID-McKayPt-RecPlan2023-v2.0.dwg Jun 15, 2023, 9:46am Pearce.Swerdfeger



INDEX MAP
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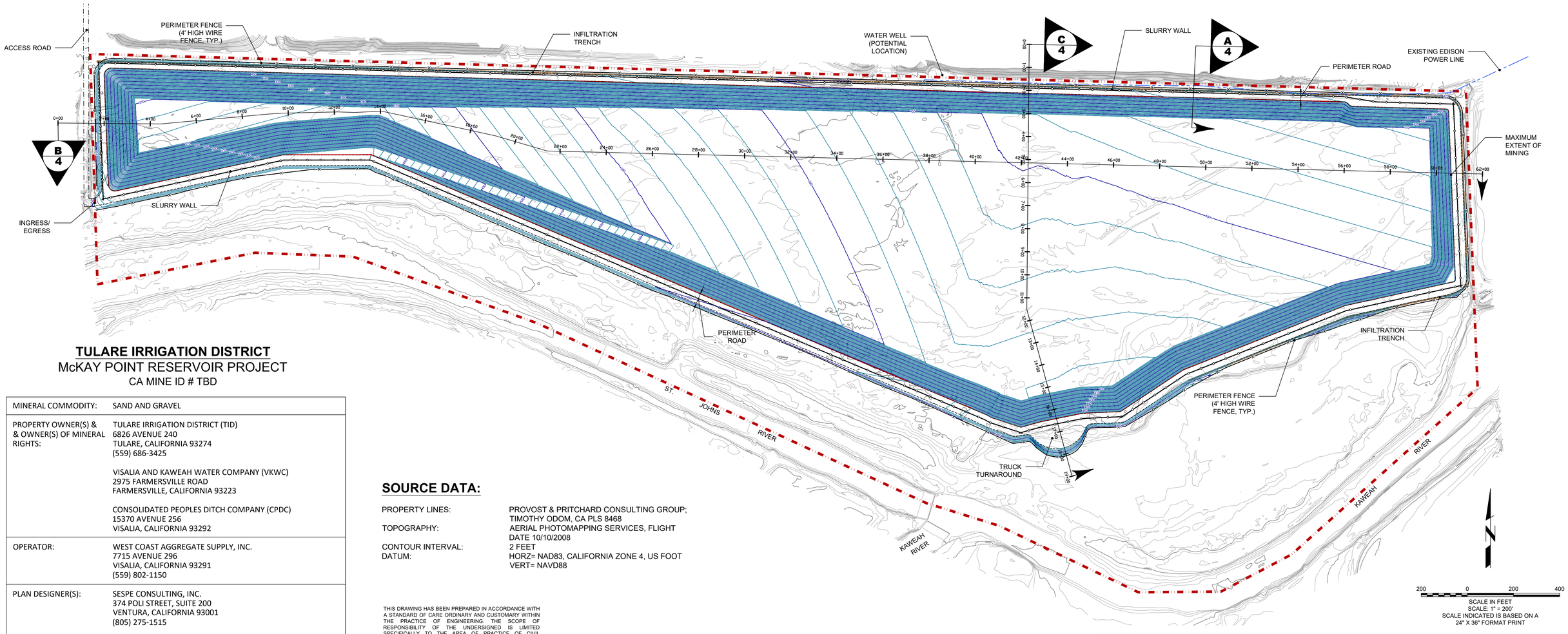
FIGURE 1:	SITE OVERVIEW
FIGURE 2:	**MINING PLAN**
FIGURE 3:	RECLAMATION PLAN
FIGURE 4:	CROSS SECTIONS

LEGEND:

- PROPERTY BOUNDARY
- EXISTING TOPOGRAPHY
- MAXIMUM PIT MINING CONTOURS
- LIMIT OF MINING
- PERIMETER FENCE
- SLURRY WALL
- INFILTRATION TRENCH
- PERIMETER ROAD

MINING NOTES

1. THE MAXIMUM EXCAVATED PIT WILL HAVE A DEPTH OF 60 TO 90 FEET BELOW THE EXISTING GROUND SURFACE. PIT SLOPES WILL NOT EXCEED 1.5H:1V (HORIZONTAL TO VERTICAL).
2. DURING THE INITIAL LIMITED EXCAVATION AND MATERIAL PROCESSING STAGE, AN IMPERMEABLE SLURRY WALL WILL BE CONSTRUCTED AROUND THE EXACTION AREA TO LIMIT THE AMOUNT OF GROUNDWATER FLOW INTO THE EXCAVATION AS FUTURE EXCAVATION PROGRESSES BELOW THE WATER TABLE. THE SLURRY WALL WILL BE DESIGNED BY A QUALIFIED PROFESSIONAL AND CONSTRUCTED BY A QUALIFIED CONTRACTOR WITH EXPERIENCE IN INSTALLING SIMILAR FACILITIES. CONSTRUCTION WILL INCLUDE THE FOLLOWING FACILITIES:
   - A PERIMETER ACCESS ROAD THAT WOULD ALSO SERVE AS A LEVELING SURFACE FOR THE CONSTRUCTION OF THE SLURRY WALL. THE ROAD MAY VARY IN WIDTH FROM APPROXIMATELY 30 TO 50 FEET AND WILL BE BUILT ON FILL UP TO 8 FEET IN HEIGHT.
   - AN APPROXIMATELY 60- TO 90-FOOT-DEEP SLURRY WALL SURROUNDING THE EXCAVATION AREA. ITS ACTUAL DEPTH WILL BE DETERMINED DURING DESIGN AND VERIFIED DURING CONSTRUCTION BASED ON SUBSURFACE INFORMATION, TO PROVIDE THE REQUIRED REDUCTION IN GROUNDWATER INFLOW. THE SLURRY WALL WOULD BE CONSTRUCTED THROUGH THE PERIMETER ROAD AND CAPPED OFF WITH A DURABLE GRAVEL LAYER.
   - AN APPROXIMATELY 5-FOOT-DEEP WATER INFILTRATION TRENCH ALONG THE NORTHERN BORDER OF THE ULTIMATE RESERVOIR AREA.
3. THE OVERBURDEN AND EXCESS FINES RESULTING FROM THE EXCAVATION OF THE PIT AND PROCESSING OF MATERIALS WOULD BE PRIMARILY USED ONSITE TO CONSTRUCTED THE SERVICE ROAD AROUND THE PERIMETER OF THE PIT OR AS BACKFILL AGAINST THE PIT WALLS TO ACHIEVE DESIRED 3H:1V (HORIZONTAL:VERTICAL) FINAL SLOPES. ADDITIONALLY, OVERBURDEN MAY ALSO BE STORED IN VARIOUS TEMPORARY STOCKPILES LOCATED THROUGHOUT THE SITE OR AT THE BOTTOM OF THE EXCAVATION PIT AS NEEDED. NOTE THAT TOPSOIL AND SUBSOIL STORAGE IS NOT A REQUIRED ELEMENT OF THE MINE PLAN.
4. MINING SETBACKS WILL BE 30 FEET FROM THE EXTERIOR PROPERTY BOUNDARIES, 50 FEET FROM THE BANKS OF THE ADJACENT WATER BODIES, AND 50 FEET FROM THE OAK-RIPERIAN WOODLAND ON THE SOUTHEASTERN PORTION OF THE PROPERTY.
5. THE OPERATOR WILL COMPLY WITH THE CONCLUSIONS AND RECOMMENDATIONS PRESENTED BY SLR IN THE *GEOLOGY AND SOILS TECHNICAL STUDY FOR THE MCKAY POINT RESERVOIR PROJECT* (REPORT DATE: DECEMBER 2021).
6. BEST MANAGEMENT PRACTICES (BMPs) TO PREVENT EROSION, SEDIMENT, AND WINDBLOWN DUST WILL BE IMPLEMENTED AS DESCRIBED IN THE SITE-SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP). DUST WILL BE CONTROLLED THROUGHOUT THE SITE/ON UNPAVED ROADS USING A MOBILE WATER TRUCK.
7. THERE ARE NO EXISTING PUBLIC ROADS, RAILROADS, OR WATER WELLS WITHIN 500-FEET OF THE SITE. ACCESS TO THE PROJECT SITE WILL BE THROUGH THE ADJACENT SEABORN SITE TO THE WEST, WHICH CONNECTS TO ROAD 222.
8. EXISTING SOUTHERN CALIFORNIA EDISON (SCE) POWER LINES RUN ALONG THE NORTHERN PERIMETER OF THE SITE. THE PROPOSED WASH/SCREEN PLANT WILL CONNECT TO THESE EXISTING UTILITIES. NO OTHER UTILITIES (GAS TELEPHONE, WATER, ETC.) EXISTING WITHIN 500 FEET OF THE SITE.



TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

MINERAL COMMODITY:	SAND AND GRAVEL
PROPERTY OWNER(S) & & OWNER(S) OF MINERAL RIGHTS:	TULARE IRRIGATION DISTRICT (TID) 6826 AVENUE 240 TULARE, CALIFORNIA 93274 (559) 686-3425 VISALIA AND KAWEAH WATER COMPANY (VKWC) 2975 FARMERSVILLE ROAD FARMERSVILLE, CALIFORNIA 93223 CONSOLIDATED PEOPLES DITCH COMPANY (CPDC) 15370 AVENUE 256 VISALIA, CALIFORNIA 93292
OPERATOR:	WEST COAST AGGREGATE SUPPLY, INC. 7715 AVENUE 296 VISALIA, CALIFORNIA 93291 (559) 802-1150
PLAN DESIGNER(S):	SESPE CONSULTING, INC. 374 POLI STREET, SUITE 200 VENTURA, CALIFORNIA 93001 (805) 275-1515 PROVOST & PRITCHARD CONSULTING GROUP 130 NORTH GARDEN STREET VISALIA, CALIFORNIA 93291 (559) 636-1166
LEAD AGENCY:	TULARE COUNTY RESOURCE MANAGEMENT AGENCY 5961 SOUTH MOONEY BOULEVARD VISALIA, CALIFORNIA 93277 (559) 624-7000

SOURCE DATA:

PROPERTY LINES:	PROVOST & PRITCHARD CONSULTING GROUP; TIMOTHY ODOM, CA PLS 8468
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
CONTOUR INTERVAL:	2 FEET
DATUM:	HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT VERT= NAVD88

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REGISTERED PROFESSIONAL ENGINEER — A. PEARCE SWERDFEGER — NO. C87466 — CIVIL — STATE OF CALIFORNIA

A. PEARCE SWERDFEGER R.C.E. 87466 EXP. 09-30-2023

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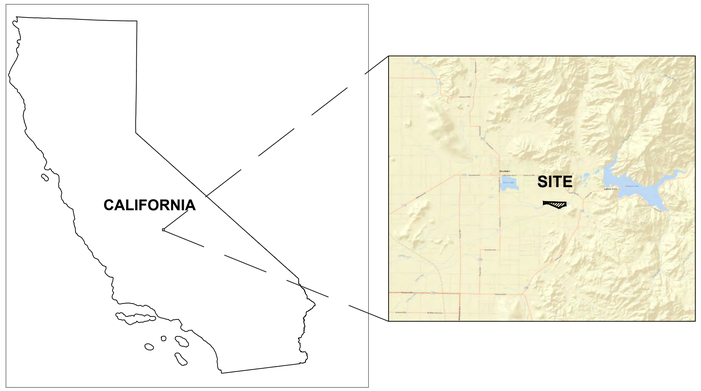
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TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT

MINING PLAN

SCALE: HORIZ. AS SHOWN; VERT. AS SHOWN
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FIGURE 2



INDEX MAP
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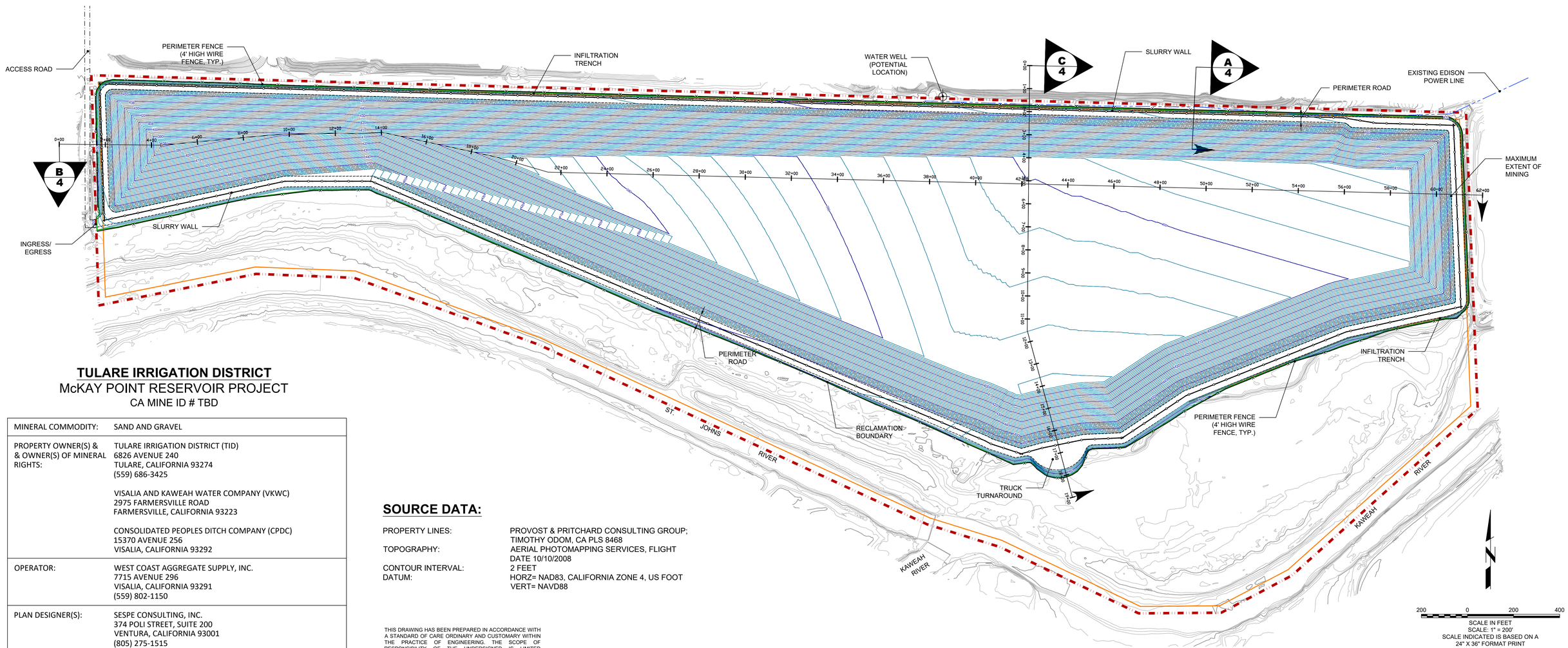
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LEGEND:

- PROPERTY BOUNDARY
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- RECLAMATION CONTOURS
- RECLAMATION PLAN BOUNDARY
- PERIMETER FENCE
- SLURRY WALL
- INFILTRATION TRENCH
- PERIMETER ROAD
- RIPRAP

RECLAMATION NOTES

1. THE FINAL, RECLAIMED PIT WILL HAVE A DEPTH OF 60 TO 75 FEET BELOW THE EXISTING GROUND SURFACE. FINAL SLOPES WILL BE CONSTRUCTED AT 3H:1V (HORIZONTAL TO VERTICAL).
2. THE IMPERMEABLE SLURRY WALL, PERIMETER ACCESS ROAD, AND WATER INFILTRATION TRENCH CONSTRUCTED AT THE INITIATION OF THE PROJECT WILL REMAIN IN PLACE FOLLOWING MINING AND RECLAMATION. CONCEPTUAL LOCATIONS OF THESE DESIGN ELEMENTS ARE SHOWN ON THE FIGURE, AND PROPOSED CONCEPTUAL DESIGN LAYOUTS ARE DEPICTED ON SECTIONS ON FIGURE 4.
3. THE OVERBURDEN AND EXCESS FINES RESULTING FROM THE EXCAVATION OF THE PIT AND PROCESSING OF MATERIALS WOULD BE PRIMARILY USED ONSITE TO CONSTRUCTED THE SERVICE ROAD AROUND THE PERIMETER OF THE PIT OR AS BACKFILL AGAINST THE PIT WALLS TO ACHIEVE DESIRED 3H:1V (HORIZONTAL:VERTICAL) FINAL SLOPES.
4. THE OPERATOR WILL COMPLY WITH THE CONCLUSIONS AND RECOMMENDATIONS PRESENTED BY SLR IN THE *GEOLOGY AND SOILS TECHNICAL STUDY FOR THE MCKAY POINT RESERVOIR PROJECT* (REPORT DATE: DECEMBER 2021).



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McKAY POINT RESERVOIR PROJECT
CA MINE ID # TBD

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TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT

RECLAMATION PLAN

SCALE: HORIZ. AS SHOWN
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FIGURE 3

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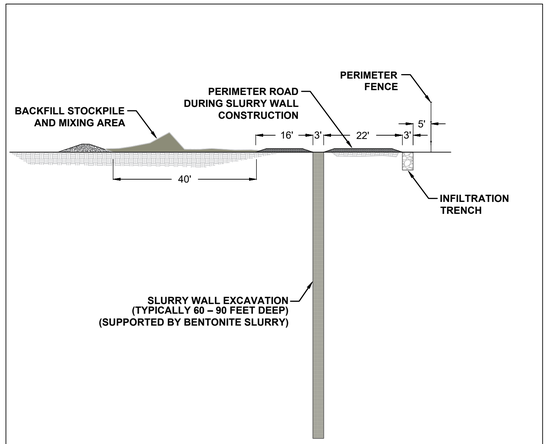
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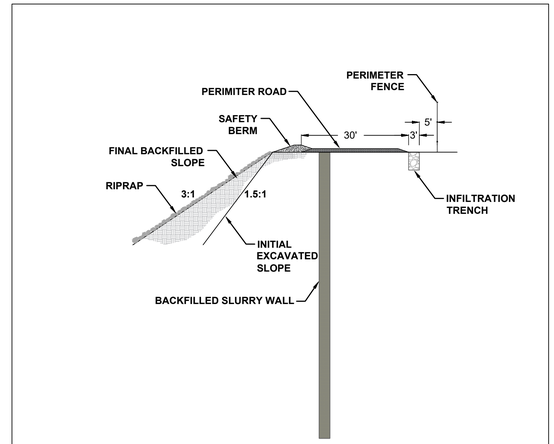
FIGURE 1: SITE OVERVIEW
FIGURE 2: MINING PLAN
FIGURE 3: RECLAMATION PLAN
FIGURE 4: SECTIONS AND DETAILS

PROFILE VIEW OF SECTION A



CONCEPTUAL SECTION A
DURING CONSTRUCTION OF SLURRY WALL

SCALE: 1" = 20'

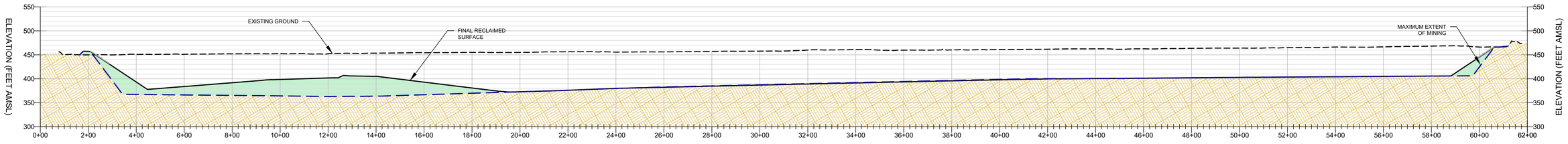


CONCEPTUAL SECTION A
COMPLETED RESERVOIR

SCALE: 1" = 20'

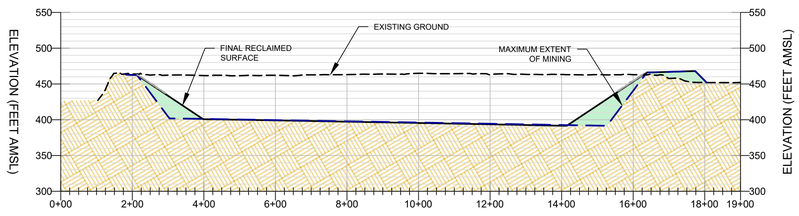
NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE AND FOR ILLUSTRATION PURPOSES ONLY

PROFILE VIEW OF SECTION B



SCALE:
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 100'

PROFILE VIEW OF SECTION C



SCALE:
HORIZONTAL: 1" = 200'
VERTICAL: 1" = 100'

SOURCE DATA:

CONCEPTUAL SECTION A DESIGN:	ADAPTED FROM *MCKAY POINT RESERVOIR PROHECT GEOLOGY AND SOILS TECHNICAL STUDY*, SLR, DECEMBER 2021.
TOPOGRAPHY:	AERIAL PHOTOMAPPING SERVICES, FLIGHT DATE 10/10/2008
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TULARE IRRIGATION DISTRICT
McKAY POINT RESERVOIR PROJECT

SECTIONS AND DETAILS

SCALE: HORIZ. AS SHOWN
VERT. AS SHOWN
DRAWN BY: G. CAMUS
CHECKED BY: APS

FIGURE 4

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APPENDIX B

Geology and Soils Technical Study – McKay Point Reservoir Project
(SLR International Corp. – December 2021)

MCKAY POINT RESERVOIR PROJECT

Geology and Soils Technical Study

SLR Ref: 117.02125.00002

December 2021

Geology and Soils Technical Study

Prepared for:

SESPE CONSULTING
374 Poli Street
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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.



Osman Pekin, PhD, PE, GE
Principal



Ian Hutchison, PhD, PE
Senior Associate

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1. INTRODUCTION

1.1. BACKGROUND

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (**Owners**) of approximately 500 acres of land adjacent to the Kaweah and St. Johns Rivers in Tulare County, California, commonly referred to as the McKay Point property (**Site**). The Site location is shown in **Figures 1 and 2**.

The Owners propose to develop approximately 200 acres of the total 500-acre McKay Point property on the north side of the divergence of the Kaweah and St. Johns Rivers into a surface water storage and reregulation Reservoir (**Reservoir**).

West Coast Aggregate (WCA) will excavate the Reservoir in accordance with plans and specifications to be developed (**Excavation**). WCA intends to process the resulting aggregate materials (i.e., rock, sand, and gravel) within the Site (**Figures 2 and 3**). WCA would then sell the processed materials.

The Excavation of a pit that will be used for the construction of the reservoir and the Construction / Operation of the Reservoir are the phases collectively referred to as the **Project**. The Reservoir phase of the Project will entail storage and release of surface water only. To minimize groundwater from entering the Excavation and the Reservoir, a subsurface groundwater barrier system (**Slurry Wall**) will be installed around the perimeter to minimize groundwater inflow. While some amount of groundwater inflow will occur during periods when the Reservoir is not full, this inflow will be pumped out and returned to nearby groundwater. The Slurry Wall will also minimize stored water losses from the Reservoir to groundwater when it is full.

The potential impacts of the Project are evaluated from a geotechnical engineering and geology perspective, based on the California Environmental Quality Act (**CEQA**). This report includes an evaluation of impacts related to the Excavation, Reservoir, and Slurry Wall components of the Project. Impact analyses for these elements are based on computer models and other evaluation methods to address the stability of temporary and permanent slopes, dewatering considerations, regional and local geologic conditions, and seismicity.

This report is organized to provide technical input for CEQA document preparation. It includes sections on the environmental setting, general Site conditions, available subsurface information on soils and groundwater, regional and local geology, seismicity, and faulting. The impact of the proposed project on the current conditions are then evaluated, based on our engineering analyses, professional opinions, and our geotechnical engineering related construction know-how. This information is then applied to the proposed development concept and its likely construction scenarios applicable to the different stages of its development. The report concludes by addressing each CEQA significance criteria related to geology and soils. Figures are provided at the end of the report. Further technical details are presented in the Appendices.

1.2. PROJECT OVERVIEW

The overview of the Project and the geology and soils conditions of the Site is based on our review of documents provided by TID (**Applicant**) or their representatives and consultants, as well as publicly available data and reports. The reviewed documents provide information on geotechnical conditions (BSK, 2011) and groundwater conditions (SLR, 2021; Schmidt, 2012; SES, 2012). Information from other documents listed in the References have also been reviewed and evaluated as part of this assessment.

The Owners propose to construct and operate the Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns Rivers near McKay Point in Tulare County, California (**Figures 2 and 3**).

The Reservoir capacity is expected to be 4,600-acre feet. Its depth is expected to range from approximately 60 to 80 feet. The material excavated during construction will consist of resource-grade aggregate and will be processed at the WCA facility to be setup within the excavation area.

The Excavation and the Reservoir will extend vertically below the groundwater levels. The Applicant will implement dry mining methods to recover the aggregate and to create the Reservoir. Dewatering of the excavated area will be conducted, as necessary to allow for dry mining techniques.

Upon completion of the Reservoir excavation, water will be diverted from the Kaweah River and stored in the Reservoir. When completed, the Reservoir will serve as a surface water storage/re-regulation facility.

2. ENVIRONMENTAL SETTING

2.1. REGIONAL SETTING

The Site is in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Central Valley is one of the most productive agricultural regions in the world.

This region is underlain by young and old unconsolidated fluvial deposits (sandy and silty gravels, clayey sand and cobbles, and silty and clayey sands) that originated from the nearby Sierra-Nevada Mountains. These moderately to highly permeable silts, sands and gravels generally extend to depths of several hundred feet or more.

The Site vicinity is drained by the Kaweah River and by the St. Johns River, which drain ultimately to the Tulare Lakebed in the southern end of the San Joaquin Valley. In 1962, Lake Kaweah, located upstream from the Site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced flooding at the Site and the surrounding area.

2.2. LOCAL SETTING

The Site is currently undeveloped and has been used for cattle grazing under lease arrangements. Most of the Site is vegetated with native grasses. Immediately to the north is CEMEX's Lemon Cove Facility. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west. Adjacent lands to the south and east are used intensively for agricultural and, to a limited extent, for rural residential purposes.

The surface soil at the Site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the River split generally to the south and southwest toward the St. Johns River. The Site elevation slopes from approximately 472 feet above mean sea level (msl) at the northeastern end of the property, downward to approximately 454 feet above msl at the southwestern end.

3. BASELINE GEOLOGIC AND SOIL CONDITIONS

3.1. REGIONAL AND LOCAL GEOLOGY

The Central Valley has been formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west (**Figure 1**). The Central Valley is an alluvial plain approximately 50 miles wide (E-W) and 400 miles long (N-S). Sediments have been deposited into the Central Valley for the last 160 million years and can be thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone and locally granitic rock underlying the alluvium at the Site. Beneath the sedimentary rocks lie an impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000 feet bgs. These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (Faunt et al., 2009). A geologic map of the region is included as **Figure 4**.

The subsurface stratigraphy of the site has been previously explored, evaluated, and reported in several studies, as cited in the References. Excerpts from available documents is reproduced in Appendix A. A total of 6 soil borings were conducted at the Site in November 2011 (BSK, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Reservoir area ranges between approximately 40 and 100 feet bgs. Alluvial deposits at the Site consist of sand that is about 15-20 feet thick. Luhrdorff and Scalmanini (1995) describe these upper alluvial sediments as Younger Alluvium. Below this, cobbles, boulders with sand, silt, and clay are common. These deposits extended to a depth of about 40 feet bgs on the eastern portion of the Site, and to about 100 feet bgs on the western portion. Luhrdorff and Scalmanini (1995) describe these lower alluvial sediments as Older Alluvium.

Geologic cross-sections for the Site have been prepared previously and included in **Attachment A** (Available Subsurface Information). The SLR geologic cross-sections depict a generalized view of the subsurface strata in the E-W and N-S directions across the Site (Attachment A). These generalized depictions are suitable for planning-level studies but are not intended for design, which will require additional subsurface explorations at the Site. The profiles shown are based on information at discrete locations and depths and actual subsurface condition variations across the site will vary. Section 5 of this report describes the subsurface stratigraphy in further detail in terms of engineering characteristics of the materials, for use in slope stability and slurry wall evaluation purposes.

The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within about a mile to the north, east, and south of Site. The surrounding hill and outcrop features suggest bedrock could get deeper to the west and southwest, towards the valley. Available borings encountered bedrock in the easterly portion of the site, at approximately 77 ft bgs. In the westerly portion of the site, bedrock was not

encountered within the explored depths of about 90 feet bgs, indicating it would be deeper than that.

Available photos of the bedrock cores indicate hard, granitic rock where it was encountered, as shown in **Figure 5**. Weathered or decomposed bedrock zones and some discontinuous intrusions of clay or clayey sand may also exist. There is an approximate 10- to 15-foot thick mantle of very dense silty, clayey sand overlying the bedrock. This layer generally follows the top of rock, likewise dipping down to the west. Both the bedrock and the overlying mantle of very dense soils are expected to be less pervious than the overlying alluvial materials and therefore provide a good opportunity to key-in a slurry wall to achieve the desired hydraulic barrier.

3.2. GROUNDWATER

Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley (SLR, 2021). Groundwater elevations in the region vary from around 460 feet amsl near the Site, to around 250 ft amsl near the City of Visalia (DWR, 2014). Groundwater is pumped extensively in the area for agricultural and urban uses.

The Site is in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (DWR, 2003). The long-term water level measurements for wells in the immediate Site area indicate relatively stable water levels, with a slight downward trend in recent years. Seasonal water level fluctuations in the Site vicinity have generally varied by less than 20 feet for the last 50 years (Fugro, 2007).

Based on available soil borings within the Site, the depth to groundwater ranges from 7 to 20 feet bgs. Further information on known groundwater levels and trends in and around the vicinity of the Site are provided in the Hydrology Report (SLR, 2021). The groundwater levels will fluctuate over time, with seasonal variations, and other factors.

3.3. FAULTS AND SEISMICITY

The Site is located in an area of relatively moderate seismicity for California. This area is centrally located between two zones of significant seismicity: the Eastern Sierra Seismic Zone, located approximately 50 miles to the east, and the San Andreas Fault Zone located approximately 80 miles to the west. There are no active or potentially active faults within 30 miles of the Site. A map of active faults in the area is provided in **Figure 6**. A list of active faults and their respective distances to the Site is provided in **Table 1**.

The nearest potentially active fault is the Independence Fault located approximately 48 miles east. This fault is part of the Owens Valley Fault Zone which is capable of producing large earthquakes, such as the Owens Valley Earthquake of 1872, which is estimated to have been a magnitude 7.4 event.

Table 1. Active Faults in the Area

Source	Distance (km)		Deterministic Magnitude	Fault Mechanism	Dip Angle
	(km)	(miles)			
Independence	77.0	47.9	7.2	Normal	50
Birch Creek	89.6	55.7	6.6	Normal	50
Owens Valley	90.5	56.2	7.3	Strike Slip	90
Great Valley 14 (Kettleman Hills)	90.7	56.3	7.2	Reverse	22
So Sierra Nevada	96.2	59.7	7.5	Normal	50
Great Valley 13 (Coalinga)	100.6	62.5	7.1	Reverse	15
Round Valley	101.5	63.1	7.1	Normal	50
White Mountains	104.1	64.7	7.4	Strike Slip	90
San Andreas Creeping Section Gridded	106.2	66.0	6	Strike Slip	90
Hunter Mountain Connected	111.1	69.1	7.6	Strike Slip	90
Hunter Mountain-Saline Valley	111.1	69.1	7.2	Strike Slip	90
Little Lake	117.4	72.9	6.9	Strike Slip	90
Great Valley 12	117.6	73.0	6.401	Reverse	15

Note: Data obtained from EZ-FRISK, Source: USGS 2008

Earthquakes on active or potentially active faults, depending on magnitude and distance from the Site, can produce a range of ground-shaking intensities. Although there are no active faults within the immediate vicinity of the Site, distant earthquakes have historically caused strong ground-motion in the Site vicinity. The most significant example is perhaps the aforementioned Owens Valley Earthquake which occurred in March of 1872. The epicenter was approximately 56 miles east of the Site, but this earthquake is estimated to have caused strong (Mercalli Intensity, MM VI) shaking intensities in the area (Hough and Hutton, 2008).

The current state of practice to determine the seismic hazard at a given location is to perform a Probabilistic Seismic Hazard Analysis (PSHA), from which the probability of exceeding a specific ground motion parameter (typically the Peak Ground Acceleration (PGA)) within a time period is calculated. Typically evaluated sets of probability and time-period are seismic events with 10% probability of occurrence in 50 years, and those with 2% probability of occurrence in 50 years. These probabilities correspond to return periods of 475 and 2,475 years respectively. The probability of exceedance of the ground motion parameter is calculated based on the following input parameters:

- Seismic sources that can generate ground shaking at the Site;
- Characteristics of each seismic source: length, rate of ruptures, maximum magnitude, earthquake occurrence;
- The ground motion parameter versus distance attenuation relationships appropriate for each seismic source and Site conditions.

Seismic sources include active and potentially active faults (or fault zones) in the vicinity of the Site. Active faults are those that have experienced displacement within Holocene time (the past

11,000 years) whereas potentially active faults are those that have experienced displacement within Quaternary times (approximately past 1.6 million years).

The United States Geological Survey (USGS) website provides tools that are commonly used to identify the active and potentially active faults that could generate ground shaking at sites located in the United States. These tools are also used to perform the probabilistic seismic hazard analysis to estimate the level of ground shaking a given site may experience. These tools are based on the user defined location coordinates of the site, and a user defined radius of influence selected based on the general level of seismicity of the site. A typical radius used for such evaluations is on the order of 100 km (67 miles).

The peak ground acceleration (PGA) was estimated using the USGS seismic hazard analysis calculator with the following parameters:

- Exceedance Probability of 10% in 50 years (return period of 475 years) and 2% in 50 years (return period of 2,475 years);
- Shear velocity of the deposit over the top 30 m (100 ft) of 450 m/s (1,355 ft/s) corresponding to a sandy gravelly deposit; and
- Latitude and longitude of 36.4° and -119.04° respectively.

The maximum PGAs for the Site were estimated to be 0.1 g for a return period of 475 years and 0.2 g for a return period of 2,475 years. PSHA outputs are included as **Attachment B**. It is noted that these PGA values are not equivalent to the seismic coefficient used in the pseudostatic slope stability analysis. Guidelines for Evaluating and Mitigating Seismic Hazards in California, SP-117 (California Geological Survey, 2008) states PGA should not be used as a pseudostatic coefficient, as that would result in overly conservative factor of safety (FS). The generally accepted value for pseudostatic coefficient is 0.1, with an acceptable FS of the order of 1.1.

The Site may be subjected to moderate to strong shaking based on correlations between PGA and the Modified Mercalli Intensity chart relating perceived shaking to PGA (Trifunac and Brady, 1975), provided by the USGS (**Table 2**).

Table 2. Modified Mercalli Intensity and Peak Ground Acceleration

PERCEIVED SHAKING	NOT FELT	WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
Potential Damage	None	None	None	Very light	Light	Moderate	Moderate-Heavy	Heavy	Very heavy
Peak Acc (% g)	<0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
Peak Vel (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+

3.4. SOILS AND EROSION

The baseline conditions at the Site is essentially flat, sloping gently downward to the south and west. The Site is undeveloped, so erosion is minimal and there are no known slope failures at the Site. Soil erosion is limited to the relatively steep slopes facing the Kaweah River at the southern portion of the Site, and select portions of the few man-made dirt roads at the Site. Other than these small areas, the Site is almost entirely covered with vegetation.

The upper 5-10 feet of the onsite soil consists of poorly-graded sand with increasing gravel at depth. Below 15 feet, the soil consists of sandy and silty gravel of increasing size and rounded cobbles to approximately 30 to 35 feet bgs. At greater depth, silty clayey sand and silty clay/low plasticity clay are predominant before bedrock is encountered (BSK, 2011).

4. PROJECT SETTING

4.1. INTRODUCTION

The project consists of the following key components / stages of work:

- Installation of a perimeter slurry wall system to reduce water inflow and initial limited excavation until the complete slurry wall system is in service;

- Excavation of the pit that will be used for reservoir with temporary slopes, and production of aggregate;

- Placement of permanent slopes over the excavation slopes, and the construction of the Reservoir.

Each of these project phases are discussed in the following sections. The existing and proposed topography of the Site are shown in **Figure 7**.

4.2. SLURRY WALL AND INITIAL LIMITED EXCAVATION

During the initial limited excavation and material processing stage, an impermeable slurry wall will be constructed around the exaction area to limit the amount of groundwater flow into the excavation as future excavation progresses below the water table. This initial, relatively shallow excavation area is estimated to be approximately sufficient for a 6-month supply of processed material, while the slurry wall is constructed.

The slurry wall will be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. Construction would include the following facilities:

- A perimeter access road that would also serve as a leveling surface for the construction of the slurry wall. The road would vary in width from approximately 30 to 50 feet and be built on fill up to 8 foot in height.

- An approximately 60- to 90-foot-deep slurry wall surrounding the excavation/Reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow. As shown on **Figure 3**, the slurry wall would be constructed through the perimeter road and capped off with a durable gravel layer

- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate Reservoir area.

A conceptual layout of the project elements and on-site facilities applicable to this stage of work is shown in **Figure 8**. A typical section showing the Slurry Wall, slope, access road, and the infiltration trench is provided in **Figure 9**.

After completion of the slurry wall, the following facilities would be demobilized from the site:

- Vehicle and equipment parking areas for the slurry wall operations.
- Fill material stockpiles.
- Equipment storage facilities.
- The bentonite slurry mixing pond(s) (see further discussion below on the slurry wall construction activities).
- The slurry wall backfill mixing area, which would be repositioned as the slurry wall construction progresses, to be in close proximity of the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench (**Figure 9**) through the road. Grading of the road would also provide a relatively level surface to install the slurry wall from and contain the slurry. The trench would be excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent caving of the trench. The bentonite slurry would be pre-mixed in slurry mixing pond(s) and pumped by pipeline into the excavated trench.
- The soils that are excavated from the trench would be placed in a nearby slurry wall backfill mixing area, for use in preparing the backfill. If the excavated materials are unsuitable, they would be hauled to the WCA operations area for processing, as appropriate. If additional suitable materials are needed, they would be obtained from the WCA operations or imported from off-site.
- As the trench is extended in length, backfilling would commence. The backfill mix would be prepared on-site, in the backfill mixing area(s). Backfill would typically include granular soils, mixed with bentonite, cement (if needed according to design), and water, to create a low permeability material of desired engineering properties. The mix design would be established based on various studies and tests which would be conducted during the design phase.
- Once mixed, the backfill would be pushed into the trench by a dozer or equivalent, from the narrow end of the trench at the opposite end of the trench that is being excavated. The backfill materials would form a slope inside the trench and displace the bentonite slurry. The operation would march in a similar manner, going around the perimeter of the Site. The backfill material in the trench would eventually consolidate and form a low permeability wall.

- The length of the slurry wall is approximately 13,400 feet. Its width would be about 3 feet. It could be wider, depending on the design. If the excavation depth is more in some segments of the wall, the trench width and/or the mix design may be adjusted according to design. Generally, using a uniform width and mix design may be preferred.

- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road as shown in **Figure 9**.

- A safety berm would be constructed along the inside edge of the road, facing the excavation area.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

4.3. EXCAVATION

Excavation is expected to proceed over an estimated period of 15 to 23 years, at an average rate of approximately 920,000 gross tons per year of silts, sands, and gravels. This rate will vary in any given year.

Excavation will be done by West Coast Aggregate (WCA). WCA would also receive, stockpile, and recycle concrete construction debris materials. A conceptual depiction of the anticipated WCA operations is shown in **Figure 8** and a longitudinal cross-section of the reservoir excavation progress over time is shown in **Figure 10**.

The excavation equipment, the material processing plant, and the associated settling pond would be located within the pit footprint. Different areas of the excavation pit bottom would be lowered in stages and the process equipment would be relocated as appropriate. As the excavation of the pit is deepened, an access ramp would be constructed in the excavated slope, as shown in **Figure 11**.

The excavated materials would be processed to produce a specified range of granular construction materials for sale. This phase of the project would include the following key facilities:

- A security fence that surrounds the excavation and eventual Reservoir area.

- A controlled access gate along the west side of the excavation area.

- A scale hose near the entrance gate to provide for weighing recycle materials coming into the site and construction materials being shipped from the site.

- A haul truck unloading and loading area.

- Portable crusher and recycle plant.

- Portable diesel fuel tank for on-site refueling (4,000 gallon).

- An aggregated production (wash/screen) plant and a crushing/ recycling plant.
- A stockpile area, or areas.
- A slurry wall
- A settling pond for clarifying/recycling process and wash water for reuse.

As shown on **Figure 7**, the excavations would occur within the footprint of the Project site. The size and depth of the excavated area would vary over time.

The excavation slope will be of the order of 1.5H: 1V (1.5 Horizontal to 1 Vertical), though other gradients and/or benched slope configurations may be developed during design, based on further geotechnical investigations, analyses, and site-specific conditions exposed during excavation. Section 5 of this report addresses the currently estimated safety factors for different scenarios.

The facilities and their layout shown on **Figures 8 or 11** are for illustrative purposes only. WCA and the design team will refine and adjust these elements as necessary, at the start of the excavation phase. All operations facilities would be kept within the excavation/ pit footprint.

During excavation phase, the area would be dewatered by using wells, trenches, or sumps according to field conditions, as described in Section 5.3.2.1. The dewatering system would drawdown the water table to near or below the excavation floor. The groundwater extraction rates would initially be minimal and increase to their maximum, as the excavation is depended to the maximum depth. The planning-level estimates of dewatering rates and other pertinent information are provided in the Hydrology Report (SLR, 2021).

The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel-filled infiltration gallery along and outside of the northern border of the slurry wall as shown on **Figures 8 and 9**.

The estimated material balance from Excavation is as shown in **Table 3**.

Table 3. Estimated Material Balance from Excavation

ITEM	ESTIMATED QUANTITY	REMARKS
Material Generated from Excavation	16.4 million tons (11,049,300 cy)	1.5H:1V Slope
Exported as product	11.5 million tons	
Use for on-site fill	2.4 million tons	3H: 1V Slope
Use for Road Construction	0.1 million tons	
Use for Slurry Wall	0.2 million tons	

Waste and Shrinkage	2.2 million tons	

4.4. RESERVOIR

The final stage of the excavation is the earthwork required to provide suitable conditions for the construction of the Reservoir. The preparation of the pit for the reservoir is referred to as "earthwork". After the excavation phase is finished, including the earthwork for preparation of the reservoir, the reservoir itself will be constructed. These stages are described below:

- Earthwork: Backfilling of the excavation slopes to flatten them from 1.5H: 1V to 3H:1V. This is shown in **Figures 9**, **10 and 11**. The backfill would be of suitable materials that has both sufficient strength and is relatively free draining. It would be constructed from the bottom up in compacted layers of suitable thickness. The Excavation slopes will be benched, and the reservoir slope fill would be keyed into the wedge of native slope materials in front of the Slurry Wall. If needed, additional slanted chimney drain zones can be provided while the slope fill is being placed from the bottom up. **Figure 11** shows the first layer of the backfill being placed along the east side of the excavation.

- Reservoir: The construction of the Reservoir to include the channels, pumps, pipelines, power supply system, and the monitoring system. A conceptual plan of the Reservoir is shown in **Figure 12**.

5. GEOTECHNICAL STABILITY ANALYSIS

5.1. INTRODUCTION

This section describes the geotechnical objectives in order to achieve the desired Excavation and Reservoir performance. It includes a discussion of the initial excavation and final construction of the Reservoir, the design of the excavation, slurry wall and the final Reservoir operational condition. It provides the planning level technical basis to demonstrate the feasibility of the project form a slope stability and the slurry wall cutoff points of view.

5.2. MATERIAL PROPERTIES

Available subsurface information at the site consists of six (6) borings B-1 through B-6, performed by BSK Associates in November 2011. These borings provide descriptions of the subsurface strata, which have been generalized into five strata as described below and used in the slope stability modeling.

5.2.1. MOIST SAND

In the available borings, this light colored, moist, SAND layer generally exists from the ground surface down to depths ranging from 7 to 15 feet below ground surface (bgs). It has a typical thickness of 12 feet. It is expected to have little to no cohesion and is expected to be medium-dense. The bottom of this layer is at or slightly above the groundwater levels noted in the borings.

In the slope stability analysis material layers as depicted in the output figures (slope stability profiles) provided in **Attachment C**, this layer is shown in yellow.

5.2.2. WET SAND, GRAVEL, COBBLES

This is a water-bearing layer of olive-gray colored SAND, GRAVEL, COBBLES, with an approximate thickness ranging from 15 to 25 feet. In the easterly portion of the site (Borings B-3, B-4, B-5, B-6), groundwater was noted at the top of or close to the top of this strata. In the easterly portion of the site (Borings B-1 and B-2), groundwater is noted to gradually dip to the mid-depth or slightly below the mid-depth of this layer. This stratum is also expected to have little or no cohesion, but with higher friction angles than the sandy layer above it, due to the presence of gravel and cobbles.

In the slope stability profiles, this layer is shown in gray.

5.2.3. WET CLAYEY SAND, GRAVEL, COBBLES

The top of this yellow-brown to olive-brown, wet, CLAYEY SAND, GRAVEL, COBBLE layer is generally at approximate elevation 430 feet MSL (Borings B-1 through B-5). It rises to approximate elevation 440 feet MSL near the east end of the site (Boring B-6). The thickness of this layer is of the order of 20 to 50 feet, generally increasing to the west, as the underlying

bedrock and the dense soil mantle over the bedrock dip down to the west. This layer is expected to have both cohesion due to its clay content, and relatively high friction angle due to its sand, gravel, and cobble components.

In the slope stability profiles, this layer is shown in orange.

5.2.4. DENSE SILTY CLAYEY SAND

This layer consists of mixtures of gray, olive-gray, bluish-gray, olive-brown colored SILTY CLAYEY SAND. It is described as moist to dry, indicating that it is a 'tight' formation since it is dry despite being below groundwater. In some zones, the boring logs note hard to very hard drilling. This layer is expected to have a higher strength, with properties of a stiffer cohesive material intermixed with frictional material. This layer generally tends to follow the bedrock surface as a mantle with thickness of 20 feet or more. Towards the west end of the site, bedrock was not encountered at a depth of 90 feet. The thickness of this layer may increase towards the west.

In the slope stability profiles, this layer is shown in purple.

5.2.5. GRANITIC BEDROCK

Dry, granitic bedrock was encountered at its shallowest, at elevation 400 feet MSL or 67 feet bgs in the easterly quadrant of the site (B-4). Based on an approximate extension of the bedrock surface profile to the west, the top of bedrock can be estimated to be in the range of 340 to 360 feet MSL, or 100 to 120 feet bgs, under the westerly portions of the site. Borings B-1 and B-2 in this area did not encounter bedrock withing their maximum exploration depths of 90 feet bgs. For slope stability modeling purposes, bedrock has been assigned a very high strength and is not considered to be an influencing factor in the stability calculations.

In the slope stability profiles, this layer is shown in green.

The man-placed materials related to our analysis include the following:

5.2.6. SLURRY WALL

This is expected to be a low-permeability barrier consisting of either a soil-bentonite mix or a soil-cement-bentonite mix, depending on the design details. Two types of walls have been conceptually evaluated here: one with an approximate equivalent cohesion value of 400 psf, referred to as the 'low strength wall; and another with an approximate equivalent cohesion value of about 2,000 psf, referred to as the 'moderate strength wall'. In practice, an increase in the shear resistance values for the slurry wall would be achieved by adjusting the cement content of the slurry mix.

5.2.7. COMPACTED BACKFILL

Backfill to create the 3 to 1 reservoir slope is expected to consist of excavated on-site materials which will likely be a blend of granular and fine materials obtained from the pit. For stability

purposes, the excavation slope would be benched and the backfill material will be placed against the slope in horizontal lifts. The backfill material would generally be compacted to 90% relative compaction. Based on experience, compacted fill consisting of a blend of granular and fine materials is assumed to have strength parameters of 200 psf cohesion and 33 degrees friction angle.

5.2.8. SUMMARY

The material parameters relevant to the slope stability analysis are listed in **Table 4**.

Laboratory test data is not available but presumed soil strength parameters can reasonably be assigned based on the available descriptions and professional judgement. The values assigned to each generalized strata as well as the future backfill and slurry wall materials are as summarized in **Table 4**. The permeability values listed in Table 4 are the same as those used in the Hydrology Study (SLR, 2021).

During design, additional geotechnical investigations and laboratory testing would be performed to confirm or modify these parameters as appropriate.

Table 4. Material Properties for Slope Stability Analysis

Material	Unit Weight γ (lbs/ft^3)	Cohesion c (psf)	Friction Angle Φ (°)	Permeability (ft/s)
SAND (SP)	115	0	35	5E-05 (1.5E-3)
SAND, GRAVEL, COBBLES (GP)	125	0	38	7E-04 (2E-2)
CLAYEY SAND, GRAVEL, COBBLES (SC/SM)	120	200	36	2E-06 (6E-5)
SILTY CLAYEY SAND (SC/CL)	120	400	28	5E-08 (1.5E-6)
GRANITIC BEDROCK	135	“INFINITE” STRENGTH		3E-06 (9E-5)
SLURRY WALL	130	varies	0	3E-11 9E-10
COMPACTED BACKFILL	120	200	33	2E-06 (6E-5)

5.3. SLOPE STABILITY ANALYSIS

5.3.1. LIMIT EQUILIBRIUM METHOD

Slope stability analysis has been performed using the Slide2 geotechnical software by RocScience. Slide2 is a two-dimensional limit equilibrium slope stability analysis program for estimating the slope Factor of Safety (FS) by various methods of slices. Circular surfaces were used in the analyses to identify the critical failure surface having the lowest FS for each assumed scenario.

5.3.2. EXCAVATION SLOPE STABILITY

This portion of the evaluation pertains only to the Excavation conditions until permanent reservoir slopes are constructed at a shallower gradient. Throughout the duration of excavation, dewatering systems will be in place to allow safe operation inside the pit. This requires a dewatering system capable of maintaining the groundwater water levels at or below the lowest excavation level in the pit, as excavation progresses. This would be accomplished by the combination of the perimeter slurry wall outside and interior dewatering systems inside the pit. The critical slope condition would be at the maximum excavation depth.

The desired excavation slopes would generally be targeted to achieve the steepest safe gradient. For most applications, this would be in the range of 1.5H: 1V to 1H: 1V. Depending on site-specific conditions and the localized variations in the exposed conditions, various measures are then implemented as excavation proceeds. Some of these measures may include varying the slope gradients, using benches, providing additional drainage and dewatering systems, and if needed, installing additional structural support systems.

Our analysis aimed to evaluate the feasibility of the project based on the soil parameters summarized in Section 5.2.8, without relying on additional stabilizing measures such as benches. Further evaluation and verification of these parameters will be undertaken during design and additional safeguards would be implemented during construction to address the specific conditions.

A generally acceptable FS value for temporary excavation slopes is of the order of 1.25. For relatively longer temporary excavation durations involved here, an additional margin may be desirable, though not mandated.

5.3.2.1. Dewatering Scenarios

For the fully excavated condition, the groundwater levels between the toe of the excavation slopes and front of the slurry wall system would depend on the type and location of the dewatering systems to be used, as well as the slurry wall properties, the permeability of the materials beneath the slurry wall, and the base of the excavation. The assumed permeability values based on generalized subsurface material types are as provided in Table 4. The slurry wall configuration is

as shown in the various slope stability outputs. During design and construction, further details and verification would take place.

For our evaluation, the dewatering system effectiveness between the toe of slope and the slurry wall has been assumed in three categories. In all cases, the dewatering would have to bring the groundwater levels to no higher than the toe of slope. For groundwater levels projected under the slope, three different conditions have been presumed. These are shown in the output figures of Attachment C, as part of the different slope stability analysis scenarios. From a typical construction practice point of view, these three dewatering levels may consist of the following methods:

- **Dewatering by Wells:** Groundwater assumed at or below the bottom of the excavation level between the toe of slope and the front of the slurry wall;
- **Dewatering by Continuous Trenches at the Base and Perimeter of the Excavation:** Groundwater assumed to rise from the toe of slope to + 10 feet at the front face of the slurry wall;
- **Dewatering by Intermittent Sumps:** Groundwater assumed to rise from the toe of slope to + 20 feet at the front face of the slurry wall.

The nomenclature used here for differing categories of dewatering aggressiveness is only intended as a descriptive tool, it does not to imply the application of a specific dewatering system. The suitability and the details of any dewatering system would be developed during design and construction.

5.3.2.2. Slope Gradient Scenarios

For each of these three dewatering categories, three different slope gradients have been evaluated, for a total of nine (9) scenarios. The results of these scenarios are briefly described below and summarized in **Table 5.**

- **1.5H: 1V Slope:** The estimated FS for an excavation slope of 1.5H: 1V is satisfactory for each of the dewatering scenarios considered. The FS values range from 1.4 (with trench or sump dewatering) to 1.5 (with well dewatering). A 1H: 1V slope gradient provides an additional margin above the minimum 1.25 FS value for each of the scenarios analyzed.
- **1.25H: 1V Slope:** The estimated FS for an excavation slope of 1.25H: 1V is adequate with trench or sump dewatering. An added margin can be achieved if a more aggressive dewatering well system is used. It may be possible to achieve higher FS values with this slope with other dewatering methods, depending on the results of further explorations, additional field and laboratory tests, and refinements that can be made during design and construction.
- **1H: 1V Slope:** The estimated FS values for an excavation slope of 1H: 1V range from 1.1 (with sump dewatering) to 1.2 (with trench or well dewatering). These findings may vary depending on the results of further studies. Unless additional studies indicate otherwise, a 1H: 1V excavation gradient is not considered to be suitable under the current assumptions.

5.3.2.3. Summary oof Excavation Slope Stability Scenarios

The estimated Factor of Safety (FS) for different excavation slope scenarios is summarized in Table 5.

Table 5. Estimated Factor of Safety for Different Excavation Scenarios

Excavation Slope Gradient	Condition Analyzed		
	Excavation dewatered from toe of slope to slurry wall	Excavation dewatered from toe of slope to +10 feet at slurry wall	Excavation dewatered from toe of slope to +20 feet at slurry wall
1.5H: 1V (33°)	1.5	1.4	1.4
1.25H: 1V (39°)	1.4	1.3	1.3
1H: 1V (45°)	1.2	1.2	1.1

5.3.3. RESERVOIR SLOPE STABILITY

Upon completion of excavation, the cut slopes will be backfilled to a permanent gradient of 3H: 1V to use the facility as a reservoir. The reservoir will be subject to various cycles of filling and emptying. The results of the slope stability analysis for this long-term use condition are summarized in **Table 6.**

The analysis for reservoir slopes have included steady state, rapid drawdown, and seismic (pseudostatic) conditions. A commonly used dynamic slope stability analysis method is pseudostatic analysis. This method applies a simulated equivalent acceleration acting on the mass of a potential slide mass, using limit equilibrium analysis methods. The ground motion parameter used in a Pseudostatic analysis is referred to as the seismic coefficient “k”, which is different than the peak ground acceleration values.

Steady State:

Steady state seepage conditions were incorporated in the model using the groundwater boundary conditions for the final configuration, using the estimated hydraulic conductivities of subsurface layers and the properties of the slurry wall cutoff system.

Rapid Drawdown:

The rapid drawdown conditions are applicable when the reservoir is emptied. Emptying the reservoirs is expected to occur over approximately 2 weeks which would allow some of the water pressure in the slope to dissipate. However, the analyses performed conservatively assumed no pressure dissipation, which is an extreme worst-case condition.

Pseudostatic:

Seismic slope stability has been evaluated by considering an equivalent horizontal ground acceleration corresponding to a pseudostatic seismic coefficient of 0.1.

Table 6. Estimated Factor of Safety for Different Reservoir Conditions

3H:1V Backfill Placed Over	Condition Analyzed		
	Steady State	Rapid Drawdown	Pseudostatic
1.5H: 1V (33°)	1.6	1.3	1.1
1.25H: 1V (39°)	1.6	1.3	1.1
1H: 1V (45°)	1.5	1.3	1.1

The slope stability FS values for each of the permanent condition scenarios are all within their respective acceptable FS values. The rapid drawdown FS value reflects a conservative assumption and actual conditions would likely be higher. There is no significant difference in FS values for a 3H: 1V slope placed on different excavation slope gradients. This is as expected since the overall stability of the permanent slope is largely governed by the wedge of compacted fill placed over the temporary excavation slopes.

5.4. SLURRY WALL STABILITY ANALYSIS

5.4.1. FINITE ELEMENT METHOD

The analysis method aimed to assess the displacements which would develop in the slurry wall as the strength and stiffness parameters of the wall were varied over an expected range that can be achieved. Analysis was carried out using the finite element modelling software RS2, developed by Rocscience. RS2 is a 2D finite element program for soil and rock applications, with the ability to carry out slope stability analysis using the shear strength reduction method.

The developed slope model was meshed using a graded mesh with 6-noded triangles. The boundaries were fixed both in the x and y plane. Groundwater was set at a total head condition of 5 feet bgs. The typical model configuration and output graphics are provided in **Attachment D**.

The limit equilibrium method such as that used in Section 5.3, evaluates the different failure conditions of the slope system, but does not provide information on ground movements within the system. On the other hand, the fine element model evaluates the ground deformations within the system.

The FS value in limit equilibrium is based on the ratio of resisting forces in relation to the sliding forces. In the finite element method, an equivalent FS is obtained by reducing the soil strength until the deformations become excessive and the computation becomes unstable (failure). The ratio of actual soil strength in relation to the reduced strength for failure is called the Strength Reduction Factor (FRS). The FRS and FS values for a given slope would be similar, but not necessarily identical.

5.4.2. MATERIAL PROPERTIES

The basic soil strength parameters are as established in Section 5.2.8 (Table 4). These values were supplemented with elastic properties corresponding to each layer. The expanded soil material properties are as summarized in **Table 7** below.

Table 7. Additional Soil Properties for Finite Element Model (FEM)

GEOTECHNICAL DOMAIN	UNIT WEIGHT (LBS/FT3)	COHESION (PSF)	FRICTION ANGLE (DEGREES)	ELASTIC MODULUS (PSI)	POISSON'S RATIO	HYDRAULIC CONDUCTIVITY FT/SEC (CM/SEC)
SP	115	0	35	3625	0.3	5.25E-5 (1.60E-3)
GP	125	0	38	10877	0.3	7.38E-5 (2.25E-3)
SC/SM	120	200	36	5076	0.3	3.28E-8 (1E-6)
SC/CL	120	400	28	2175	0.25	3.28E-9 (1E-7)
Bedrock	135	Infinite Strength				-

The slurry wall parameters were varied to explore the deformation pattern variations for progressively stronger slurry wall compositions. **Table 8** summarizes the two different slurry wall strength and elastic properties used in the model.

Table 8. Slurry Wall Material Properties for FEM

SLURRY WALL	UNIT WEIGHT (LBS/FT3)	EQUIVALENT COHESION (PSF)	FRICTION ANGLE (DEGREES)	ELASTIC MODULUS (KSI)	POISSON'S RATIO	HYDRAULIC CONDUCTIVITY FT/SEC (CM/SEC)
Low Strength	130	400	0	1.4	0.3	3.28E-10 (1E-8)
Moderate Strength		2000		6.5		

The low strength value (400 psf cohesion) is intended to approximate a typical soil-bentonite mix. Soil-bentonite mix is commonly used in balanced pressure or modest differential-pressure situations. For detailed design purposes, the engineering properties of different slurry wall mix

designs using on-site materials will be established based on specific sampling and testing to be done.

In the case of uneven earth and substantial hydrostatic pressure differentials across a slurry wall, a more robust system may be needed, depending on several factors that will be considered during design. The moderate strength value of approximately 2 ksf cohesion, is intended to represent a soil-cement-bentonite system which is a more robust slurry wall.

5.4.3. SLURRY WALL STABILITY FOR EXCAVATION

In the FEM scenarios studied, the slurry wall and the slope have the same layout as in Section 5.3. The analyses were conducted for a 3-foot-wide slurry wall, located behind the top of the excavated slope. A slope of 1.5H:1V was applied to all Excavation scenarios since this is the most realistic case. The total excavation depth for all scenarios is 76 feet bgs.

The excavation progress in front of the slurry wall was modeled for the interim stages of excavation. The models were staged to simulate the excavation in approximate depth increments of 3.8 feet, representing a typical annual production rate, to reach the total excavation depth of 76 feet in 20 years.

Outputs from the RS2 finite element model for the various scenarios discussed here are provided in Attachment D.

For each scenario, the deflections of the slurry wall were estimated as provided in **Figures 13 and 14**. The strength reduction method was applied to obtain the critical SRF (FS) for each slurry wall strength scenario at the full excavation stage. A summary of the results for the four scenarios are provided in **Table 9.**

Table 9. Summary of FEM Results for Different Slurry Wall Scenarios

SCENARIO	ESTIMATED MAX. DISPLACEMENT (INCHES)	ESTIMATED ANNUAL DISPLACEMENT (INCHES)	SRF (FS)
Low Strength Slurry Wall (400 psf)	5.2	0.3	1.20
Moderate Strength Slurry Wall (2 ksf)	3.8	0.2	1.26

5.4.4. SLURRY WALL STABILITY FOR RESERVOIR

A finite element model analysis was performed for the case of the slurry wall behind the permanent 3H:1V slope of the Reservoir. The input for our analysis is based on the geotechnical characteristics of the materials in the excavation area, that are assessed from available boring logs.

For the conditions analyzed, the slurry wall extends from the ground surface behind the top of the outer slope, down to approximately 10 feet below the bottom of the Reservoir, into the low permeability native materials.

For the completed Reservoir with 3H:1V slopes and empty condition, which is more critical for slope stability, the calculated FS exceeds the generally accepted value of 1.5.

For rapid drawdown conditions which represents emptying of the reservoir without allowing adequate time for dissipation of water from the soil within the slope, the FS exceeds the generally accepted values which range from 1.25 to 1.40.

For pseudostatic (seismic) conditions, the FS exceeds the generally accepted value of 1.1.

Results show that the proposed slopes are sufficiently stable, including during earthquake conditions. The slope and slurry wall deformation analyses that demonstrate that the slopes and slurry wall deformations would be tolerable with adequate safety.

Further analysis during design will establish a suitable slurry wall mix design to provide the desired performance of the system.

The key design aspects of the slurry wall are the mix designs for both the bentonite slurry that is used to support the trench during excavation and for the backfill soil-bentonite mixture that forms the slurry wall. The details of these mixes would be established during the detailed design process discussed below and would incorporate the following essential design bases and criteria.

- The bentonite slurry mix, which is predominantly a bentonite-water mixture is designed to have sufficient viscosity and density to support the trench walls during excavation.
- The soil-bentonite backfill mix is designed to have a low permeability, be sufficiently ductile to adjust to deformations in the excavation slopes, and to resist the hydraulic pressures that will develop behind the wall as the Excavation is dewatered or the Reservoir is emptied.
- A key parameter in the design is to ensure the grain size of the soil materials are sufficiently large so that the water pressure cannot force them to migrate through the adjacent natural soils to prevent what is known as “piping”. Use of a soil-cement-bentonite mix could further improve the resistance to piping.

These types of walls are frequently constructed and therefore there is a sound basis for assessing appropriate mix designs that will meet the above requirements.

5.5. DESIGN AND CONSTRUCTION CONSIDERATIONS

5.5.1. SUBSURFACE INFORMATION

During design, additional boings will be performed to obtain relevant design information. Groundwater and in-situ permeability of the subsurface strata as well as the likely performance of slurry wall mix materials will also be evaluated in the design phase of the project. The slurry wall embedment depth and having an adequate cutoff depth while avoiding excess penetration into

bedrock, will be based on the soil profile variations along the slurry wall alignment. Subsurface investigations, field tests, laboratory tests, and detailed engineering evaluations will be conducted during design.

5.5.2. SLOPES

5.5.2.1. Excavation Slopes

During excavation, the slope gradients and the types and locations of dewatering elements will be adjusted by the Contractor, in consultation with professionals specialized in this type of work. There are many possible variations which would be implemented during construction. Some of these include adjusting the temporary slope gradients and the layout of benches, and the installation of temporary slope stabilization measures.

5.5.2.2. Reservoir Slopes

The permanent 3H:1V slopes will be placed over the temporary excavation slope face. This will involve benching into the Excavation slope and placement of an engineered fill buttress on the slope, in compacted lifts. Appropriate provisions for drainage and scour prevention will be made during design of the permanent Reservoir slopes.

5.5.3. SLURRY WALL

5.5.3.1. Variations in Design:

The evaluations presented in this document demonstrate that the proposed project concept is feasible. There are several variables that can be adjusted during design to achieve the desired performance. For example, a lower strength slurry wall with a greater width can achieve similar results as a higher strength wall with a narrower width. Also, the design parameters can be adjusted for different segments of the wall if the excavation depths or other demands (subsurface condition variations) require such adjustments.

5.5.3.2. Slurry Wall Materials:

The performance of the slurry wall mix materials will be further evaluated during design. The use of Soil-Bentonite (S-B) versus Soil-Cement-Bentonite (S-C-B) will be determined. While S-B wall is less expensive, it is prone to higher levels of differential settlements as well as higher lateral and cyclic deflections under uneven loading patterns. Design will evaluate the wall materials to achieve the desired long-term performance.

The percentage of fines available in the excavated soils will vary with depth and along the wall alignment. Bentonite addition, and if needed, importing borrow soils will help achieve the required hydraulic conductivity of the backfill mix.

A geotechnical investigation program may include evaluation of likely borrow source areas in the project area. A geotechnical laboratory testing program will provide information on the mix design

and its hydraulic conductivity, consolidation, and strength characteristics. Typically, different mix designs would be prepared and tested to meet the desired characteristics. Also, the mix design would attempt to maximize the use of on-site soils.

5.5.3.3. Slurry Trench Stability:

The open excavation trench would be stabilized by using a bentonite slurry. Design and construction will need to address trench stability through the water-bearing gravelly zones in the upper alluvium. In such conditions, the mix design may need to be adjusted and/or other protective measures, such as trench shields, may be needed. When appropriately designed and constructed, gravel intermixed with other finer materials can help reduce the amount of consolidation settlement of the slurry wall.

The bentonite-water slurry material will provide trench stability and caking on the sidewalls. The slurry material properties (viscosity, density, filtration, pH) will be checked during construction at the mixing point and in the trench with a submerged sampler to facilitate sampling from different depths.

5.5.3.4. Construction Quality Control:

A comprehensive construction quality control and testing program would verify that the parameters intended during design are achieved during construction. Items to be checked during construction may include:

- Various properties of the slurry and backfill materials;
- Adjustments to those properties based on conditions encountered;
- Checking, sampling and testing of the advancing backfill slope (gradient, slump, density, fines content, hydraulic conductivity);
- Checking the cleanliness of the trench bottom;
- Noting the amount of consolidation of the slurry backfill materials;
- Performing other observations, tests, collecting monitoring data, and timely use of such information to make adjustments as the work progresses.

Remedial measures (such as topping off consolidated zones) would be implemented based on the monitoring data collected, and other observations.

After construction is completed, event-based monitoring could include inspections and monitoring data evaluations after significant seismic and storm events.

5.5.3.5. Resiliency Considerations:

During Excavation, the slurry wall will be subject to considerable differential hydraulic gradients between the back and the front of the slurry wall. There will be some differential earth pressures due to level ground on one side and slope on the other. There may also be moisture condition variations due to changes in groundwater conditions, seasonal and climatic variations, dewatering patterns, and non-uniform layering with different water retention properties of soils. Such factors can introduce wetting-drying cycles and/or loading-unloading cycles. Under such conditions, it is normal for fissures to develop in the slurry wall. However these are not anticipated to affect the

performance of the Slurry Wall, as it will still be capable of minimizing inflow in conjunction with appropriate dewatering elements.

During permanent use, the permanent slope will provide a substantial buttressing benefit. During permanent use, multiple cycles of filling and emptying of the reservoir as well as the seasonal and climatic factors may introduce some wetting and drying of the slurry wall, but this will be of a much-reduced nature due to the added soil cover in front of the slurry wall. Also, the load-unload cycles will have a much less significant influence on the slurry wall due to the buttressing effect of the fill. The deflection patterns felt at the slurry wall will diminish during permanent use, which is also evidenced by the Finite Element Modelling results.

5.5.3.6. Monitoring and Verification of Wall Performance:

A monitoring program will need to be implemented to check the performance of the completed wall. Monitoring would include groundwater levels at different locations on either side of the slurry wall, as well as the settlement of the slurry wall. Additional monitoring details related to the slurry wall performance would be developed as recommended by the designer.

5.6. CONCLUSION

The project is feasible from a geotechnical point of view. Additional studies will provide the necessary information needed as the project progresses into its design and construction phases.

6. EVALUATION OF POTENTIAL IMPACTS

6.1. CEQA SIGNIFICANCE CRITERIA

Geology and Soils impacts are described in subsequent sections based on an evaluation of geotechnical, geological, and conditions, and consideration of potential changes to ground conditions due to the Project. A geology and soils impact is considered significant if it would result in any of the following, adapted from the CEQA Guidelines:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known active fault trace;

   ii. Strong seismic ground shaking;

   iii. Seismic-related ground failure, including liquefaction;

   iv. Landslides.

b) Result in substantial soil erosion or loss of topsoil.

c) Located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

6.2. IMPACT GS 1 (CRITERION "A"): SEISMIC HAZARDS

The majority of Tulare County is free of the faults noted on the Alquist-Priolo Earthquake Fault Zoning Map. Such faulting is noted only along the eastern-most boundary with Inyo County. As such, there is no known active earthquake fault in or within 30 miles of the Project site. Risks associated with different manifestations of seismic hazards are addressed below.

6.2.1. Fault Rupture (Criterion "A.i")

Earthquake surface rupture is the physical displacement of surface deposits, either laterally or vertically, along a fault trace. Surface rupture is the surface expression of the subsurface fault movement and generally only occurs along or within a few hundred feet of the fault trace that moves during an earthquake. Not all large earthquakes have a surface expression or co-seismic surface rupture (e.g. blind thrust faulting associated with the 1994 Northridge, M_W6.7 earthquake).

The proposed Project is in Tulare County which is not a designated Alquist-Priolo Earthquake Zone (APEZ) as issued in Special Publication 42 by the California Geological Survey (2007). Geographic areas are designed as APEZ if they encompass potentially active or active faults.

A review of the 2014 fault activity map for California shown on **Figure 6** and tabulated on Table 1 indicates that no active faults cross the Site. The closest faults to the Site are the Independence Fault, the Owens Valley Fault Zone, and the San Andreas Fault Zone at least 35 miles from the Site. Because the Site is not located within or near and APEZ, the potential for surface fault rupture at the Site is considered to be insignificant.

6.2.2. Ground Shaking (Criterion "A.ii")

Ground Shaking Intensity:

The estimated ground shaking (acceleration) at the Site does not pose a potentially significant impact because Project's proposed design accounts for the estimated ground acceleration and therefore ground shaking is expected to pose a less than significant impact. The proposed slopes into the quarry are at an inclination of 3:1 (Horizontal to Vertical) corresponding to an angle of 18.5 degrees. The materials at the site range from silty sand to sandy gravel with shear resistance characterized by friction angles which, for that type of material, ranges from 30 to 38 degrees. Stability analyses were carried out for these conditions and the applicable pseudostatic coefficient. The calculated FS values as discussed in Section 5, meet the necessary stability criteria.

Ground Shaking Induced Seiche:

Seismic events can create hazards with their impact on water bodies. One such phenomenon is Tsunami, which would not apply here since the Site is not near the coast. A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes as a result of ground shaking. The wave can reduce water levels at one end of the water body and increase the water level on the other, similar to the "sloshing" of water back and forth.

The risk of seiche developing in the proposed reservoir as a result of ground shaking during an earthquake has been evaluated and the results indicate this to be unlikely.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave.

The natural period of the reservoir can be calculated using the Merian formula assuming a rectangular basin (USNRC, 2011).

$$\mathrm{T} = \frac{2\,L}{\sqrt{gh}}$$

Where L is the length of the basin, g the acceleration of gravity (32.2 cm/sec^2), and h the depth of water. Combining a representative value of 600 ft as the average width of the basin and a depth of water h of 70 ft, the natural period of the reservoir is estimated to be:

$$T = \frac{(2)(600)}{\sqrt{(32.2)(70)}} = 25\ s$$

This natural period is to be compared to that of the earthquake that may shake the site. The typical range of period for strong ground motion is between 0 and 5.0 seconds, with the dominant period for the site-specific event being on the order of 0.2 second (USGS, http://geohazards.usgs.gov/hazardtool/application.php). Therefore, the difference in period between the reservoir and the design earthquake is two orders of magnitude.

An empirical formula is provided in HAZUS (FEMA, 2003) to estimate the peak wave height of the seiche as:

$$H = \sqrt{\frac{A}{L\,(\pi f)^2}}$$

Where H is peak height, A the acceleration in, g's, f the frequency of the lake, and L the wavelength (5.12/ft^2). Using the PGA calculated for the 2,475 year event of 0.20 g, the maximum wave height a seiche is estimated to be 0.06 cm.

The estimated value of the peak wave for the seiche at the site is extremely low and for practical purposes, insignificant. In addition, the ratio between the reservoir and the natural period of the seismic event that could occur on site indicates that a possible resonance condition is unlikely.

6.2.3. Ground Failure, Liquefaction, Lateral Spreading (Criterion "A.iii")

Soil liquefaction is a condition in which saturated granular soils undergo a substantial loss of strength and deformation due to increased pore pressure resulting from cyclic stress application induced by earthquakes. During liquefaction, the soil becomes sufficiently mobile to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are sand deposits that are saturated, loose, clean, uniformly-graded, and fine-grained. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo differential settlement. This will result in reduction of foundation stiffness and capacity. When this occurs, the structure can settle, tip, or even become buoyant and shift upwards. Liquefaction and associated failures could damage foundations, roads, underground cables and pipelines, and disrupt utility service.

Earthquake induced liquefaction typically occurs within the top 50 ft of liquefaction-prone soil, if those soils are saturated. A review of the logs associated with borings advanced at the Site (BSK, 2011) indicates that the water table is at an average depth of 15 ft below grade (Attachment A). The saturated soils below that depth are classified as silty sand to poorly-graded sandy silt and cobbles. While some of the layers are susceptible to liquefaction, the required dewatering will lower the groundwater levels and reduce the risk of liquefaction.

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of compaction and settling of loose subsurface materials Given the geologic setting of the Site and generally competent materials, seismically-induced settlement is not considered to be a significant hazard.

Seismically induced lateral spreading involves lateral movement of earth materials laying over potentially liquefiable layers. Lateral spreading is characterized by near-vertical cracks with predominantly horizontal movement of the soil mass. Because the potential for liquefaction at the Site is generally considered to be low and groundwater suppression has to be in effect, the potential for lateral spreading is considered to be low. Pseudostatic slope stability analysis indicates adequate slope stability FS.

6.2.4. Seismically Induced Landslides (Criterion "A.iv")

Slope stability under Site baseline conditions does not present a significant hazard. There are currently no significant slopes or other topographic features at the Site that appear susceptible to slope failure. The California Geologic Survey has produced a series of landslide inventory and landslide hazard maps for unstable areas of the State. The Site and the vicinity are not mapped as having pre-existing or future slope stability hazards.

Static and seismic stability of slopes to be created for the Project are addressed in Section 5 and Attachments C and D of this report.

6.3. IMPACT GS 2 (CRITERION "B"): SOIL EROSION OR LOSS OF TOPSOIL

Erosion is the removal of soils and rocks due to natural process such as flow of water and wind. Erosion is expected to occur within the Project site as a result of excavation, but not at the ground surface (i.e., outside the Project perimeter); therefore, ground erosion is considered to be a less than significant impact.

Vegetation and topsoil will be removed during the initial site preparation and excavation the Project site. Topsoil removed will be stockpiled for use in reclamation/revegetation of the Project site, and/or the adjacent CEMEX Lemon Cove Facility site in accordance with the SMARA-approved Reclamation Plan. The reservoir slopes would be designed to include appropriate scour prevention measures.

6.4. IMPACT GS 2 (CRITERION "C"): GROUND INSTABILITY

This CEQA criterion seeks to answer if the Site is located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. The seismically induced risk of ground instability (liquefaction, lateral spreading) has been addressed in Section 5. Ground instability related to project activities are addressed in this Section. The project is considered feasible and capable of containing such risks by applying proper design and construction practices. Evaluation of different ground instability factors are addressed below.

Stability of Existing Ground Conditions:

There are no known existing geologic conditions or natural slopes that would impact the stability of existing ground conditions.

Stability of Project Slopes:

The Project involves excavation of a reservoir. The anticipated depth of the reservoir is approximately 75 ft with slopes out at 3:1 (Horizontal to Vertical).

A slurry wall will be installed around the perimeter of the pit. The subsoil conditions at the Site were established based on existing onsite soil boring logs and the grain size analyses performed on samples recovered during the drilling operations (BSK, 2011). The subsoil conditions generally consist of sand, sandy gravel, and clayey sand with cobbles. For the purpose of our slope stability evaluation, a representative cross-section was developed and slope stability analyses were performed as discussed in Section 5 of the report. Supporting analysis details are provided in Attachments C and D.

Based on our analysis, the project slopes have adequate FS values.

6.5. IMPACT GS 2 (CRITERION "D"): EXPANSIVE SOILS

The soils in the area are predominately classified as granular materials such as sand, gravel and cobbles, with some silt and occasional clay lenses. None of those soils are subject to expansion when wetted. Therefore, there is no risk to life or property from expansive soils and this hazard is considered less than significant.

6.6. IMPACT GS 2 (CRITERION "E"): SUPPORT OF WASTEWATER SYSTEMS

There are no permanent habitable facilities involved in this Project. Hence, this item is not applicable (N/A).

7. CONCLUSION

As described in previous sections, SLR has conducted a review of baseline and Project related conditions and has evaluated potential Project related impacts relating to Geology and Soils based on CEQA Appendix G criteria. Based on our evaluation, the project is feasible from a geologic and geotechnical engineering point of view. We have identified no significant impacts.

8. REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2008. Alaska Administrative Code (18 AAC 75), Oil and Other Hazardous Substances Pollution Control, as amended through October 9.

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

FEMA, 2009, Flood Insurance Study, Tulare County and Incorporated Areas.

FERC, 2012 "Notice of Preliminary Permit Application file by Kaweah River Power Authority, Federal Energy Regulatory Commission Document 2012-21178, Filed August 27, 2012.

Fugro, 2007, Water Resources Investigation of the Kaweah Delta Conservation District.

GEI/GSI, 2020, Kaweah Subbasin – Basin Setting Components, GEI Consultants and GSI Water Solutions, January 10, 2020.

GKGSA, 2020, Groundwater Sustainability Plan, Greater Kaweah Groundwater Sustainability Agency, January 22, 2020.

Irrigation Training and Research Center, undated, http://www.itrc.org/databases/cecaplrp/CEC%20APLRP%20Case%20Study%20TID.pdf. retrieved August 22, 2014.

Luhdorff and Scalmanini, 1995, Impact Analysis, Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California.

Luhdorff and Scalmanini, 2004, Assessment of Hydrology and Water Quality, Kaweah South Mining Project.

Schmidt, 2012, *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project.*

SLR, 2021, McKay Point Reservoir Project – Geology and Soils Technical Study, 2021.

Tulare Irrigation District, 2011, Groundwater Elevation Monitoring, December 2011.

US Army Corps of Engineers, 1990, Kaweah River Basin, California.

US Army Corps of Engineers, 2005, Water Control Manual, Terminus Dam and Lake Kaweah, Drought Contingency Plan for Terminus Dam and Lake Kaweah.

Kaweah and St. Johns Rivers Association (Watermaster), 1933-2020, Annual Reports.

Western Regional Climate Center, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4890, downloaded September 19, 2014.

LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations after the performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given Site area. Subsurface conditions that are not apparent may exist at the Site. Our professional opinions are based in part on interpretation of existing data by others from a limited number of discrete sampling locations. Actual subsurface conditions may vary.

Further explorations are needed for design and construction. The specific future design demands, passage of time, manifestation of latent conditions, or occurrence of future events may change the findings, observations, and conclusions in this work product.

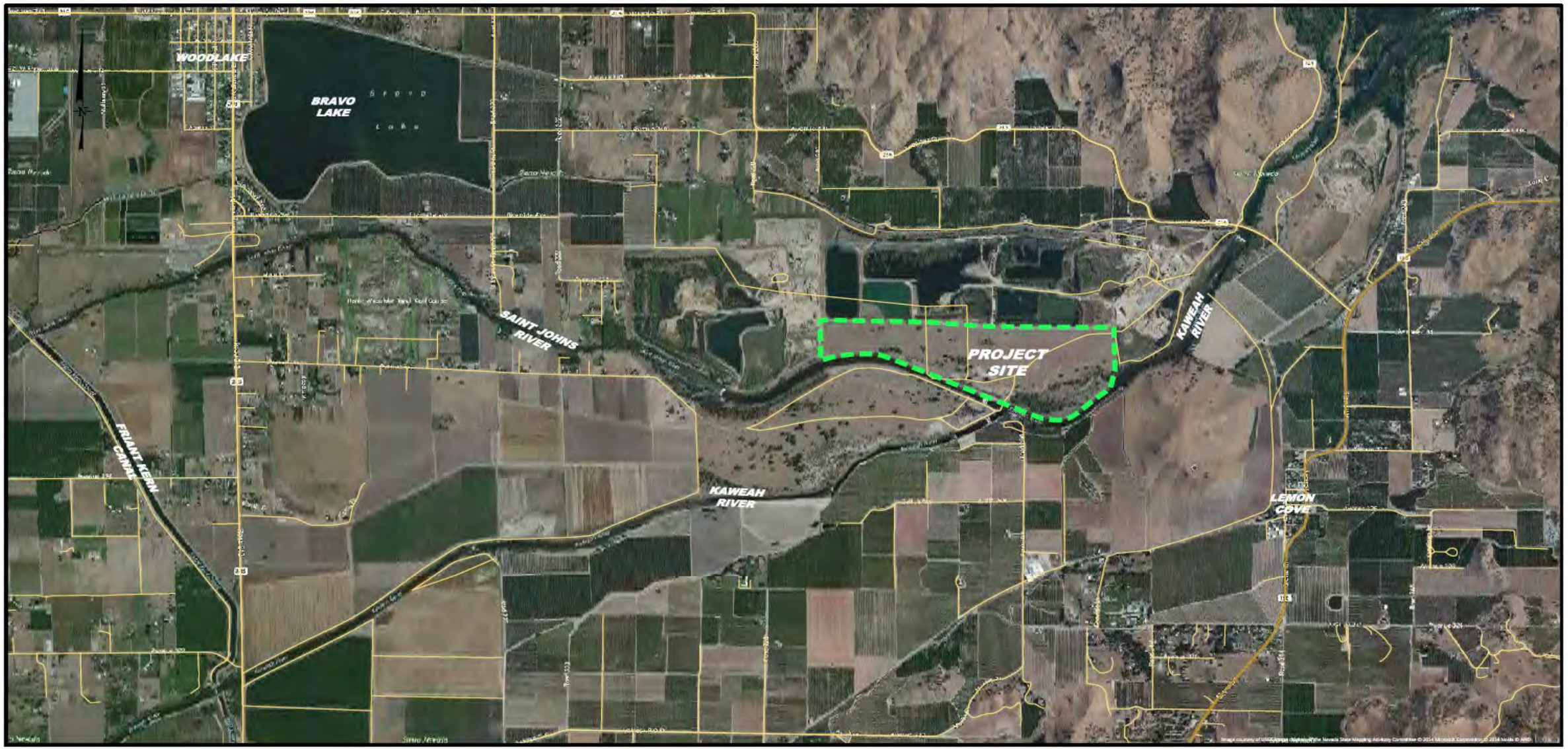
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FIGURES



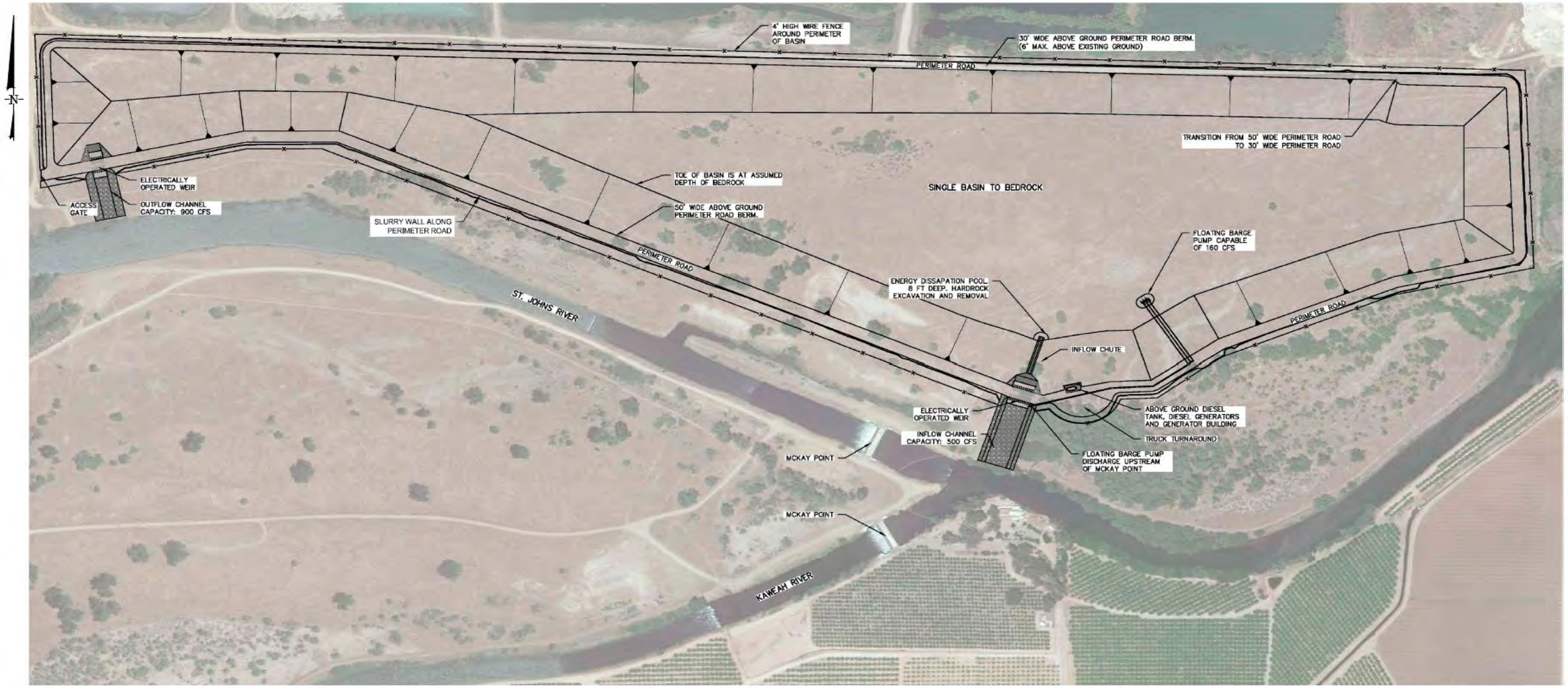
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PROVIDED BY SLR INTERNATIONAL CORPORATION Consulting Engineers & Scientists 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **SITE LOCATION MAP**	FIGURE No. **1**	REV

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	TITLE: **SITE VICINITY MAP**	FIGURE No.: **2**	REV:

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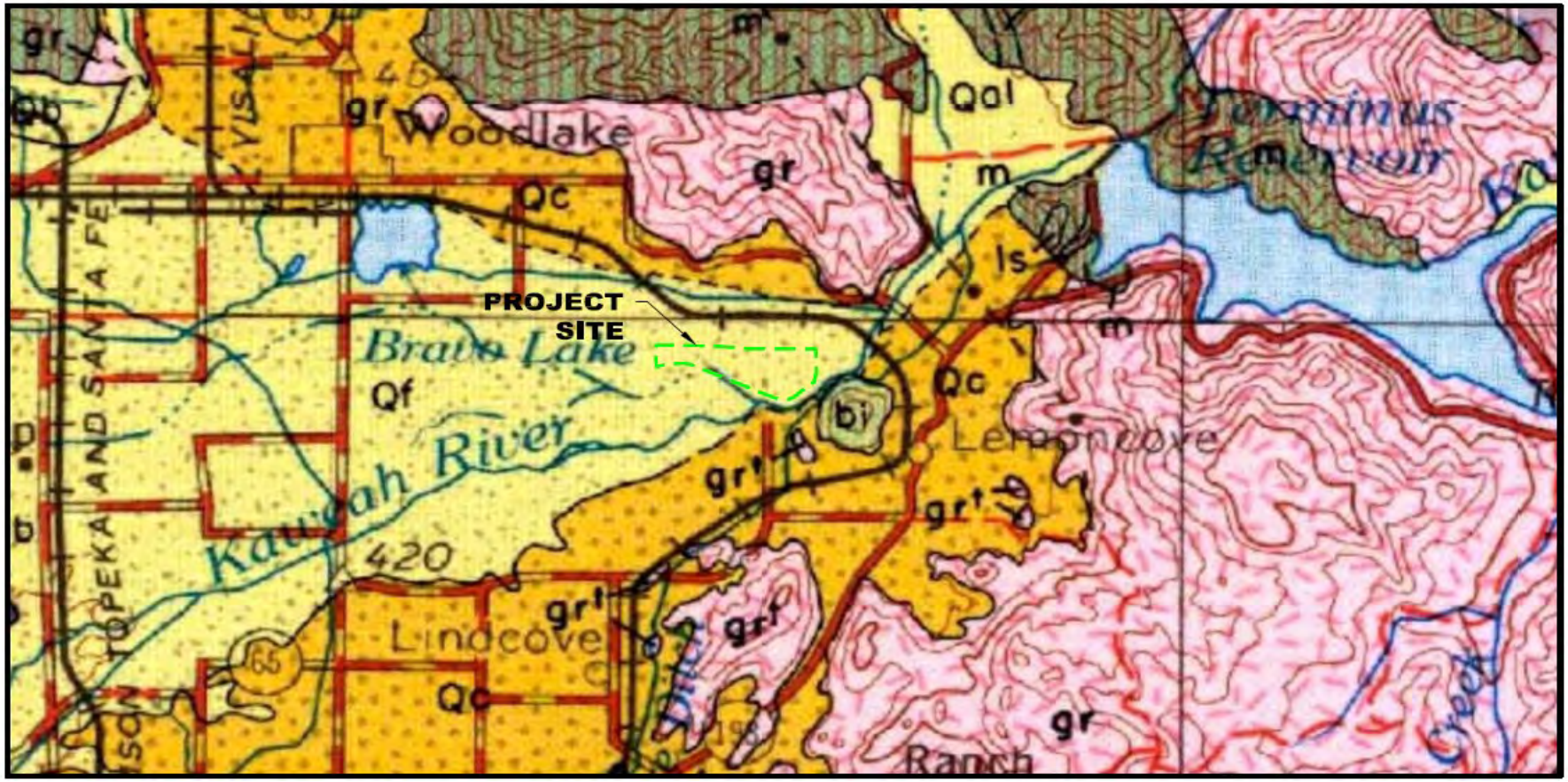


SOURCE: PROVOST & PRITCHARD, 2/18/14
FIGURE 1 - PROPOSED SITE MAP

NOT TO SCALE

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		TITLE **CONCEPTUAL PLAN**	FIGURE No. **3** / REV

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LEGEND:

- Qal - ALLUVIUM
- Qt - FAN DEPOSITS
- Qc - PLEISTOCENE NONMARINE
- gr - MESOZOIC GRANITIC ROCKS
- ub - MESOZOIC ULTRAMAFIC INTRUSIVE ROCKS
- m(ls) - PRE-CRETACEOUS METAMORPHIC ROCKS (ls = LIMESTONE OR DOLOMITE)
- ms - PRE-CRETACEOUS METASEDIMENTARY ROCKS
- mv - PRE-CRETACEOUS METAVOLCANIC ROCKS

SOURCE: GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET, CALIFORNIA GEOLOGICAL SURVEY, 1:250,000 SCALE

0 6000 FT

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	TITLE: GEOLOGIC MAP	FIGURE No.: 4 / REV:

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B-3 (86 - 90 ft)



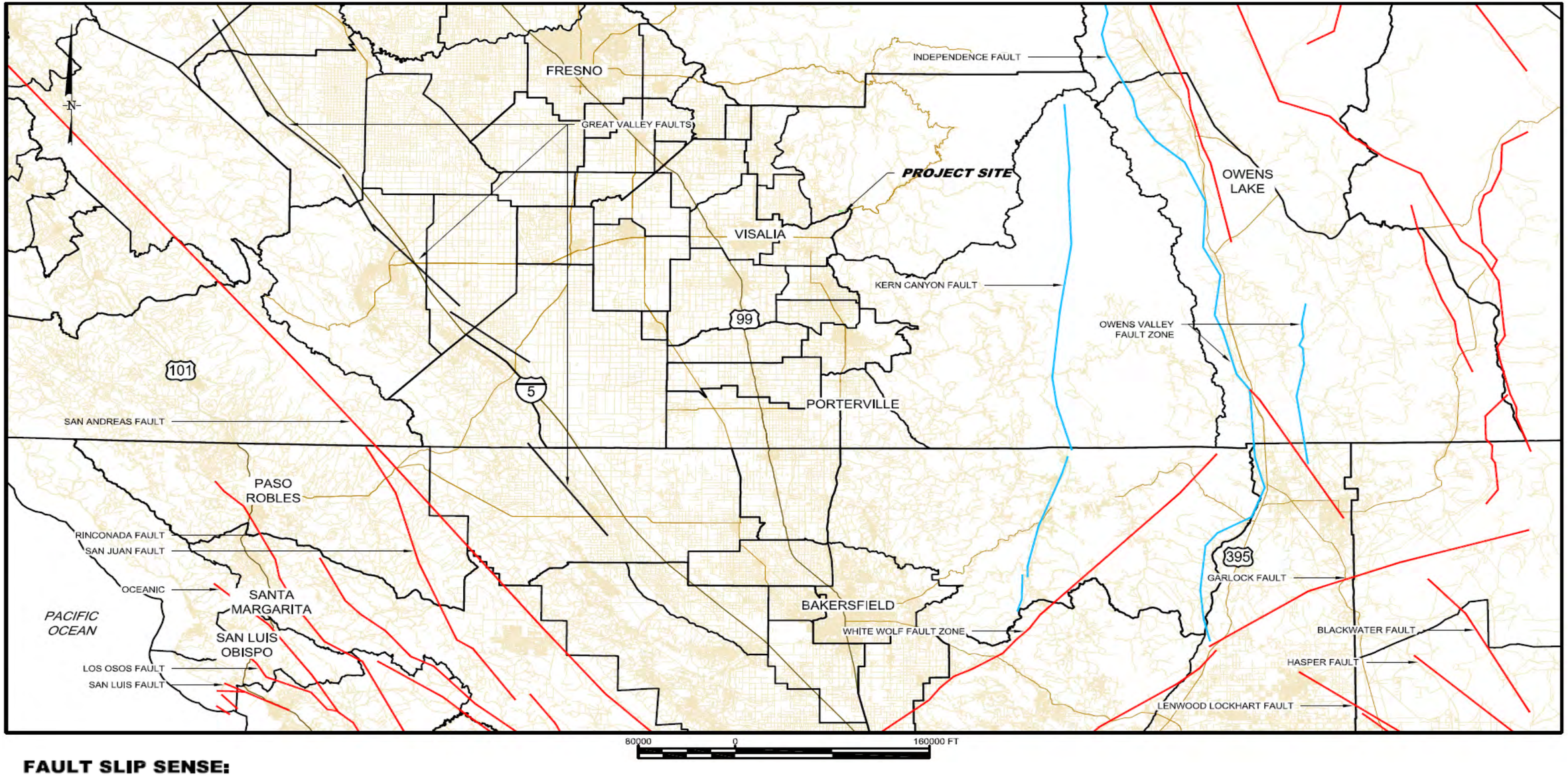
B-4 (82 - 85 ft)



B-4 (85 - 87 ft)

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	TITLE **PHOTOS OF BEDROCK CORES**	FIGURE No. **5** / REV

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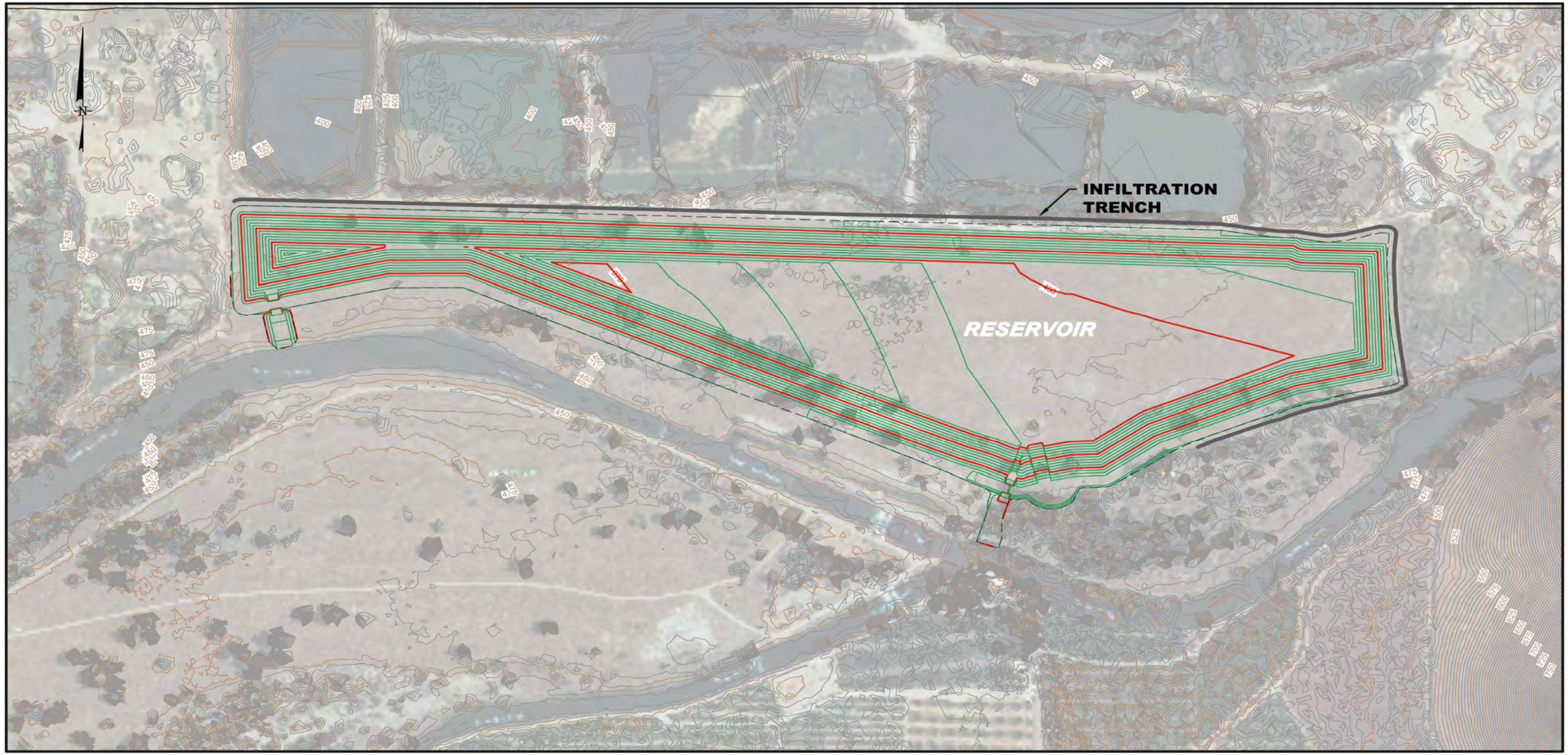


FAULT SLIP SENSE:

- STRIKE-SLIP
- THRUST –REVERSE (APPROXIMATE LOCATION)
- NORMAL

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	TITLE: ACTIVE FAULTS MAP	FIGURE No.: 6	REV

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300 0 600 FT

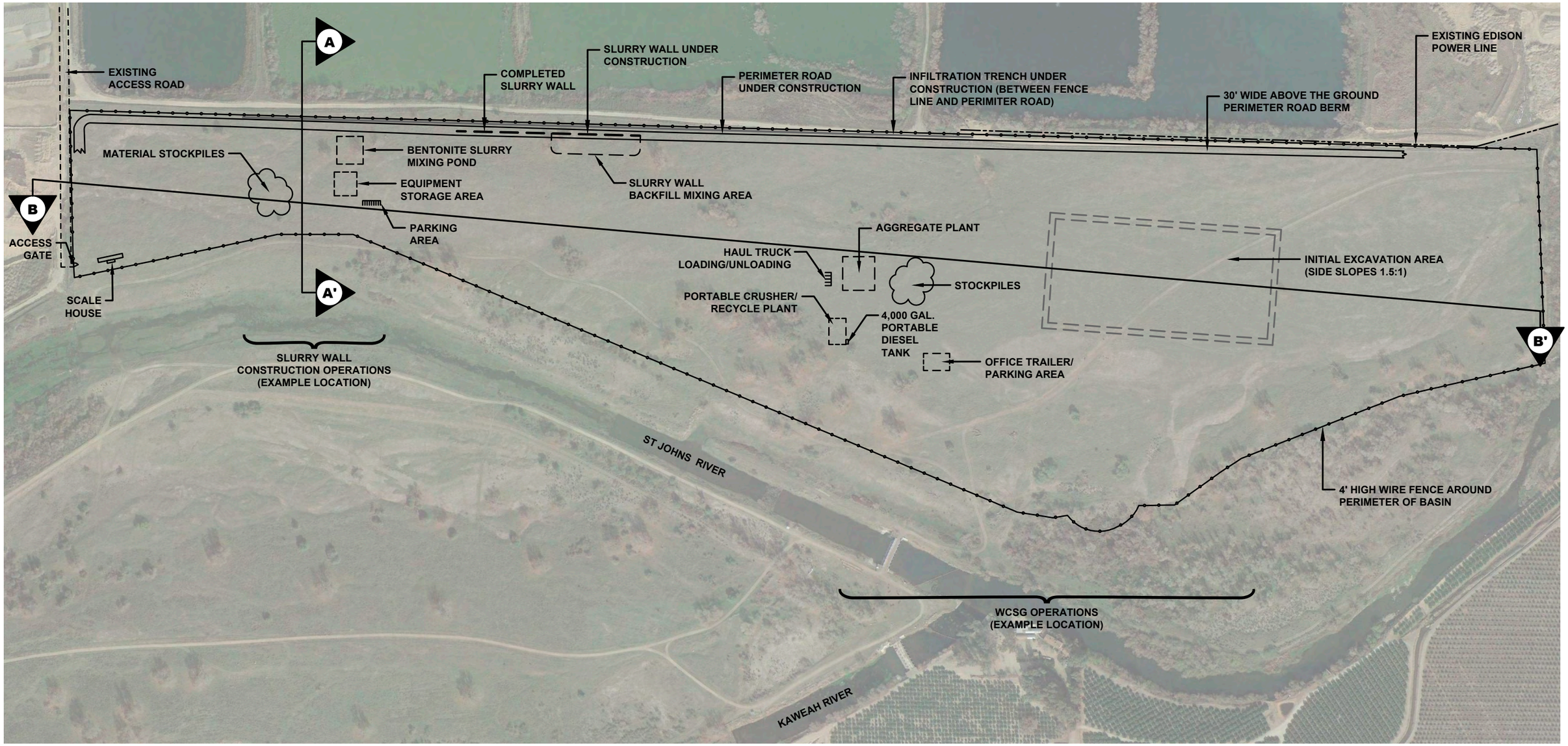
LEGEND

100 EXISTING GROUND SURFACE CONTOUR EL, FEET

100 PROPOSED GROUND SURFACE CONTOUR EL, FEET

RESERVOIR BOUNDARY

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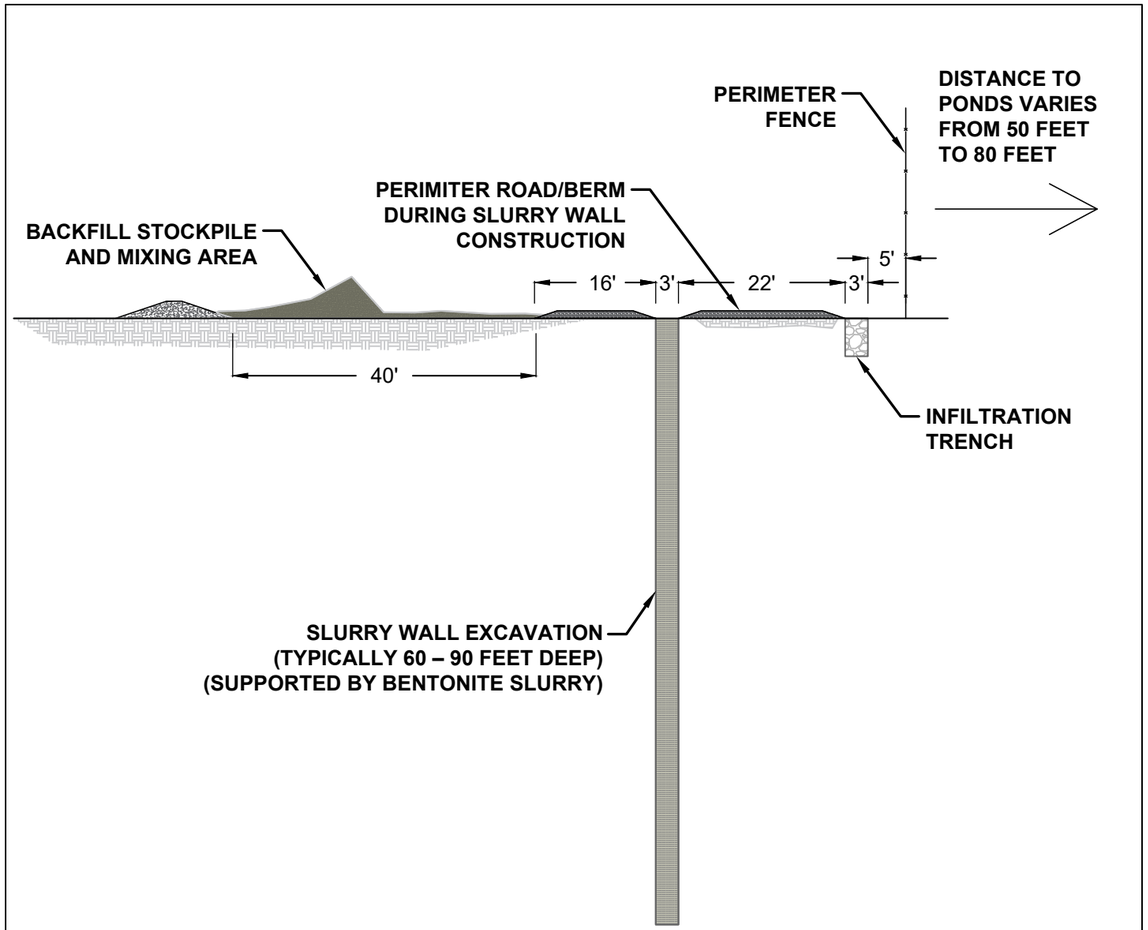


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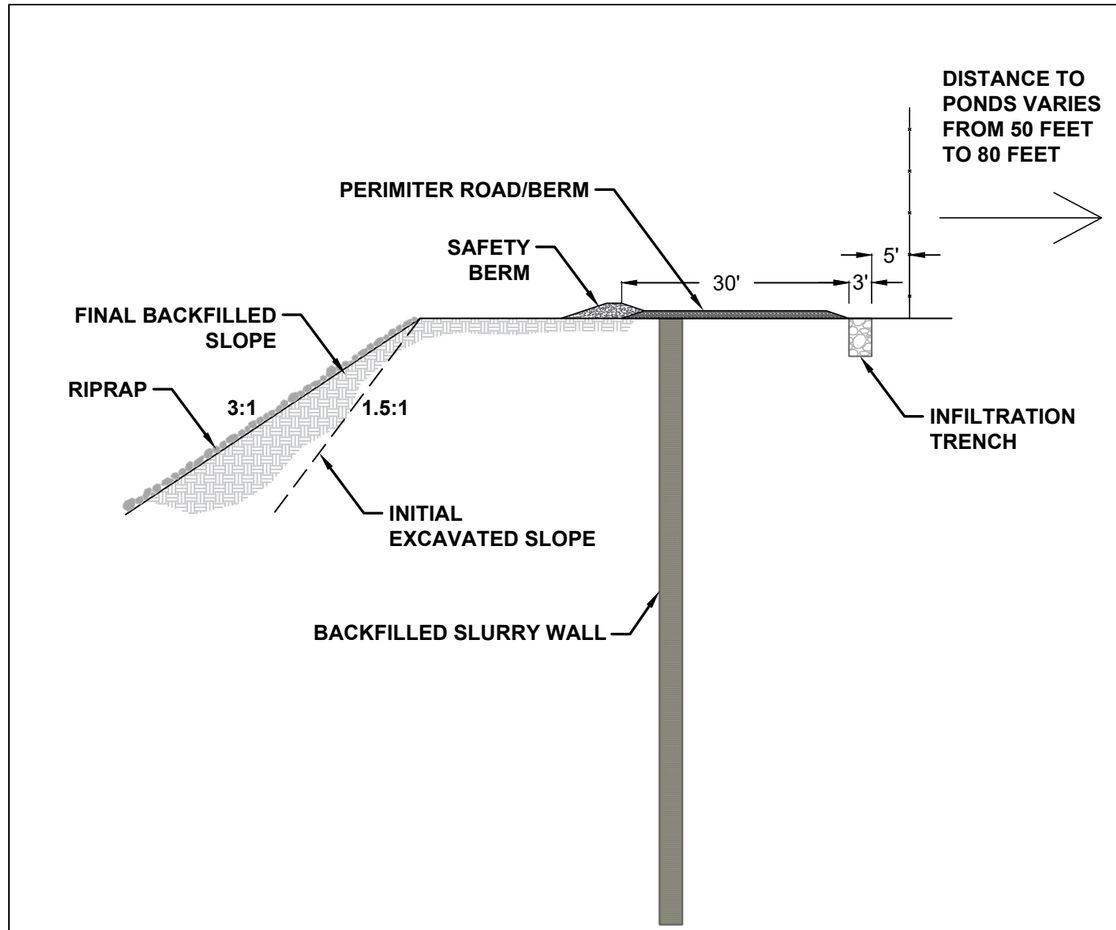
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	TITLE **INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION**	FIGURE No. **8** / REV.

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CROSS SECTION A-A'
DURING CONSTRUCTION OF SLURRY WALL



CROSS SECTION A-A'
COMPLETED RESERVOIR

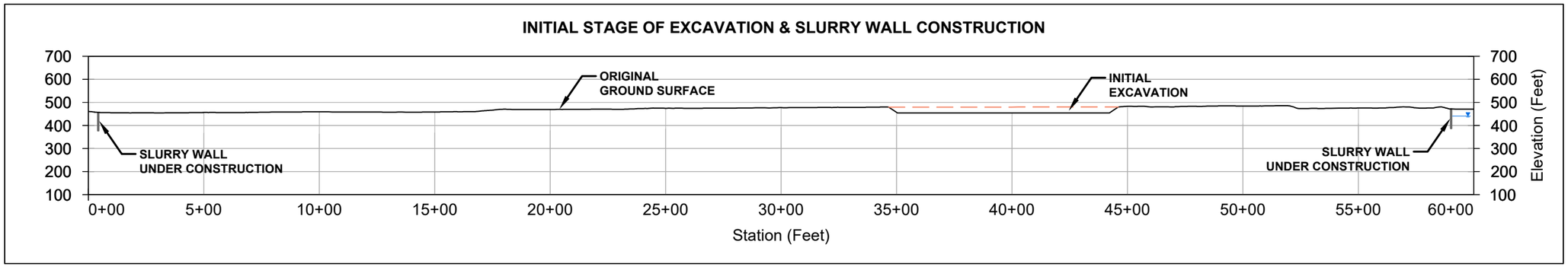
NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE
AND FOR ILLUSTRATION PURPOSES ONLY

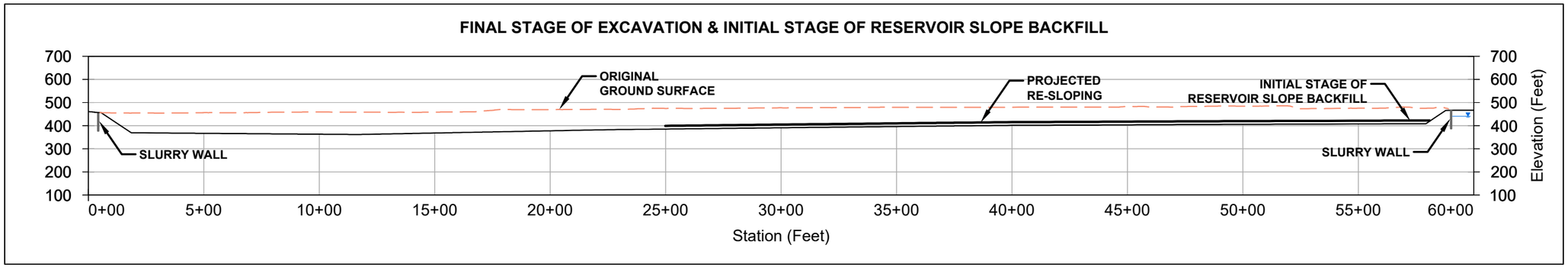
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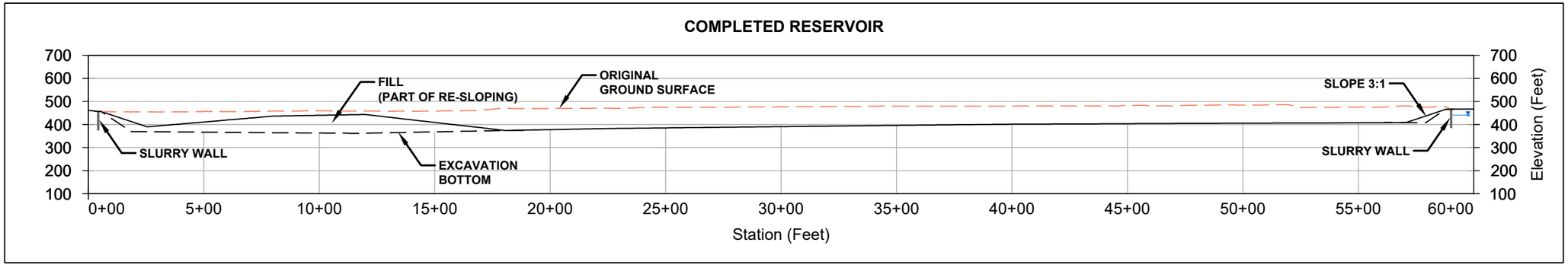
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	TITLE **PROFILE A–A'**	FIGURE No. **9** / REV.

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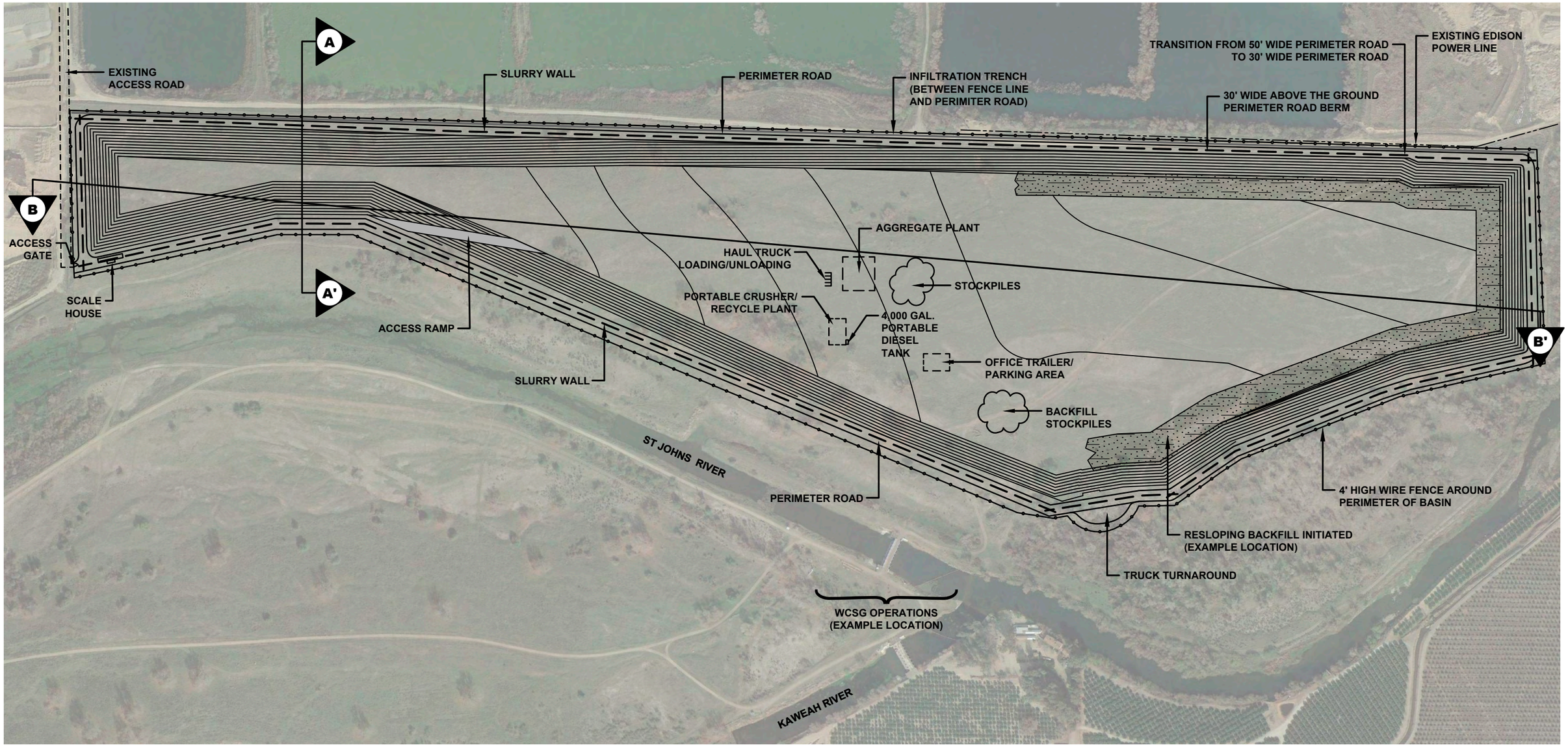




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	TITLE **PROFILE B–B'**	FIGURE No. **10** / REV.

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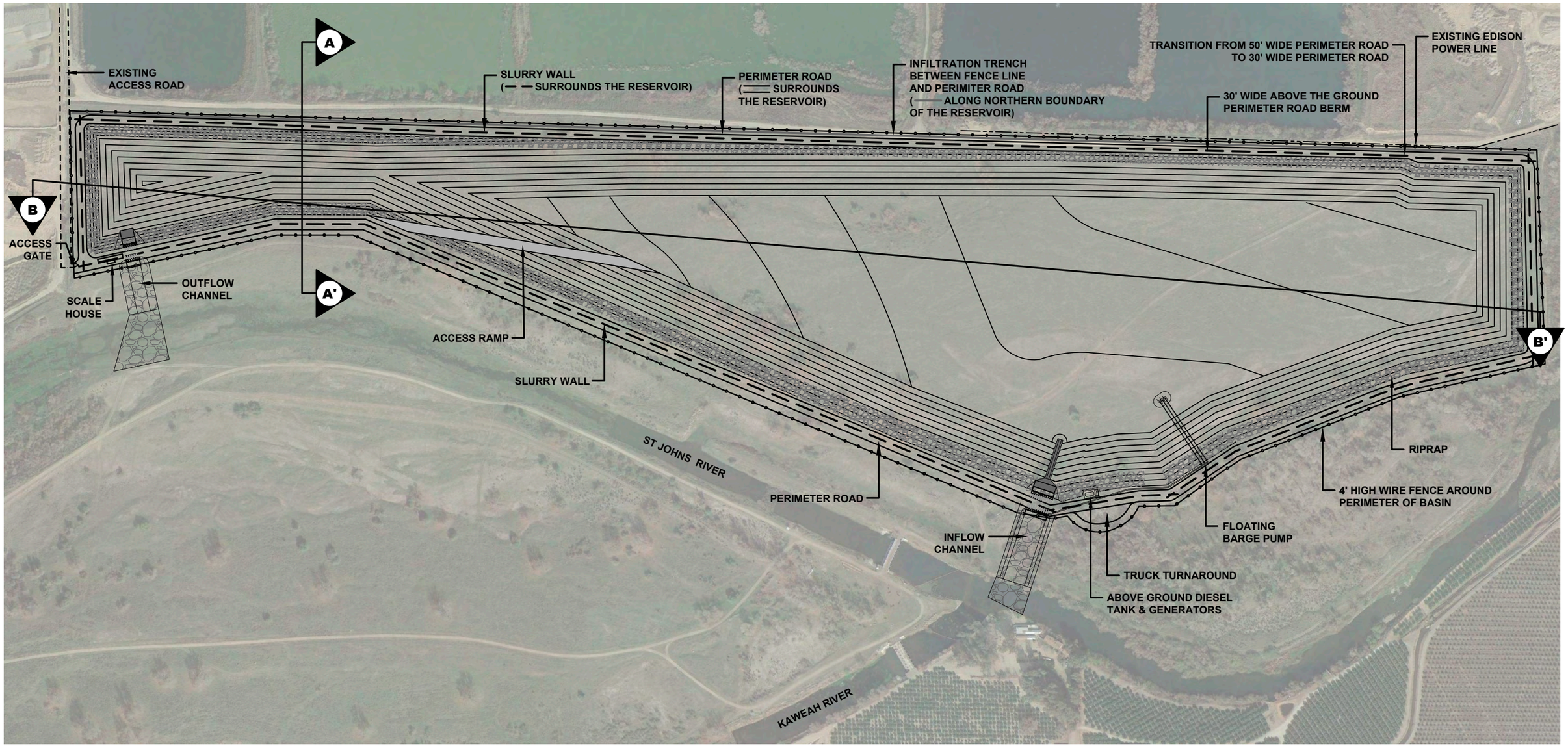


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	TITLE **FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL**	FIGURE No. **11** / REV.

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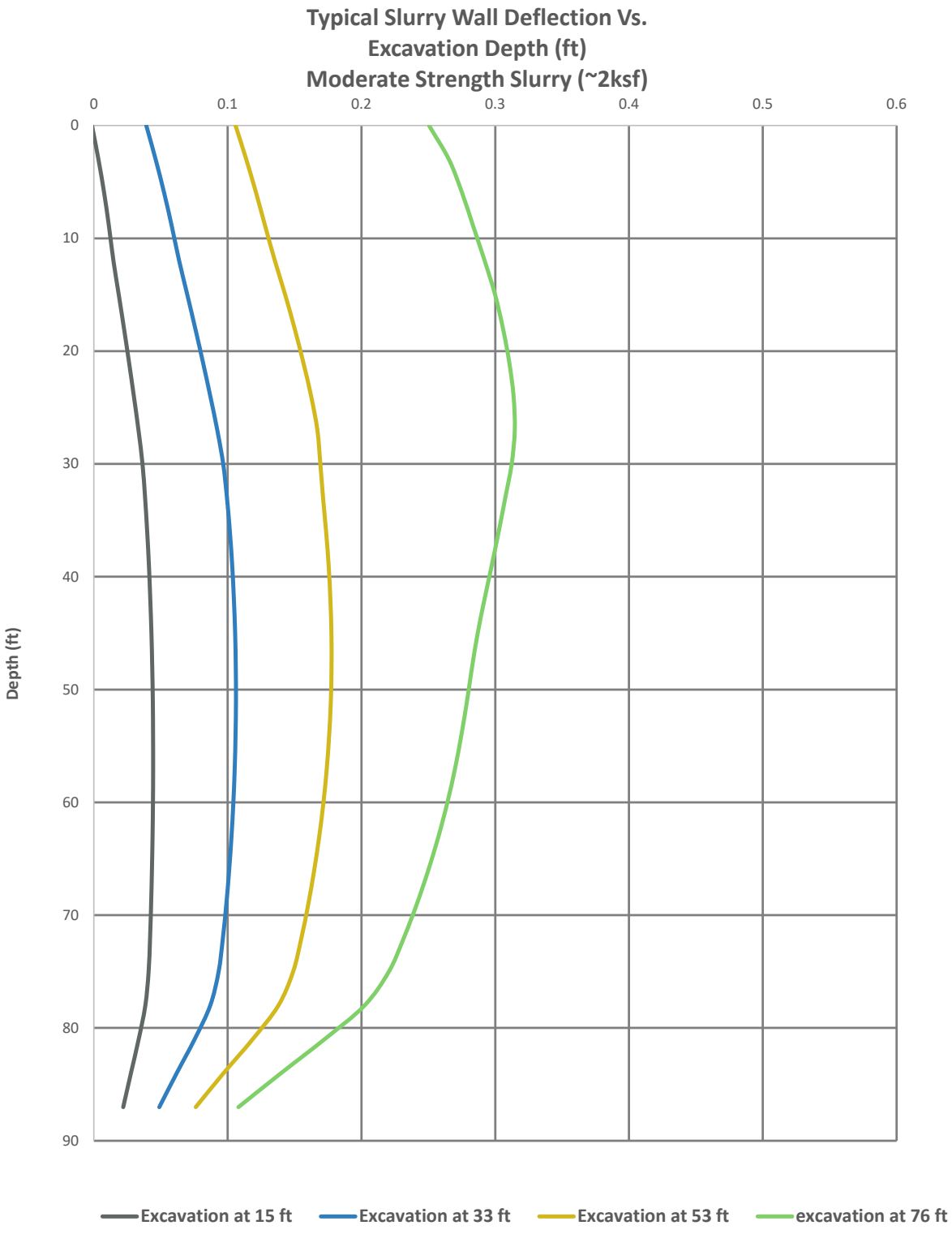


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	TITLE **COMPLETED RESERVOIR**	FIGURE No. **12** / REV.

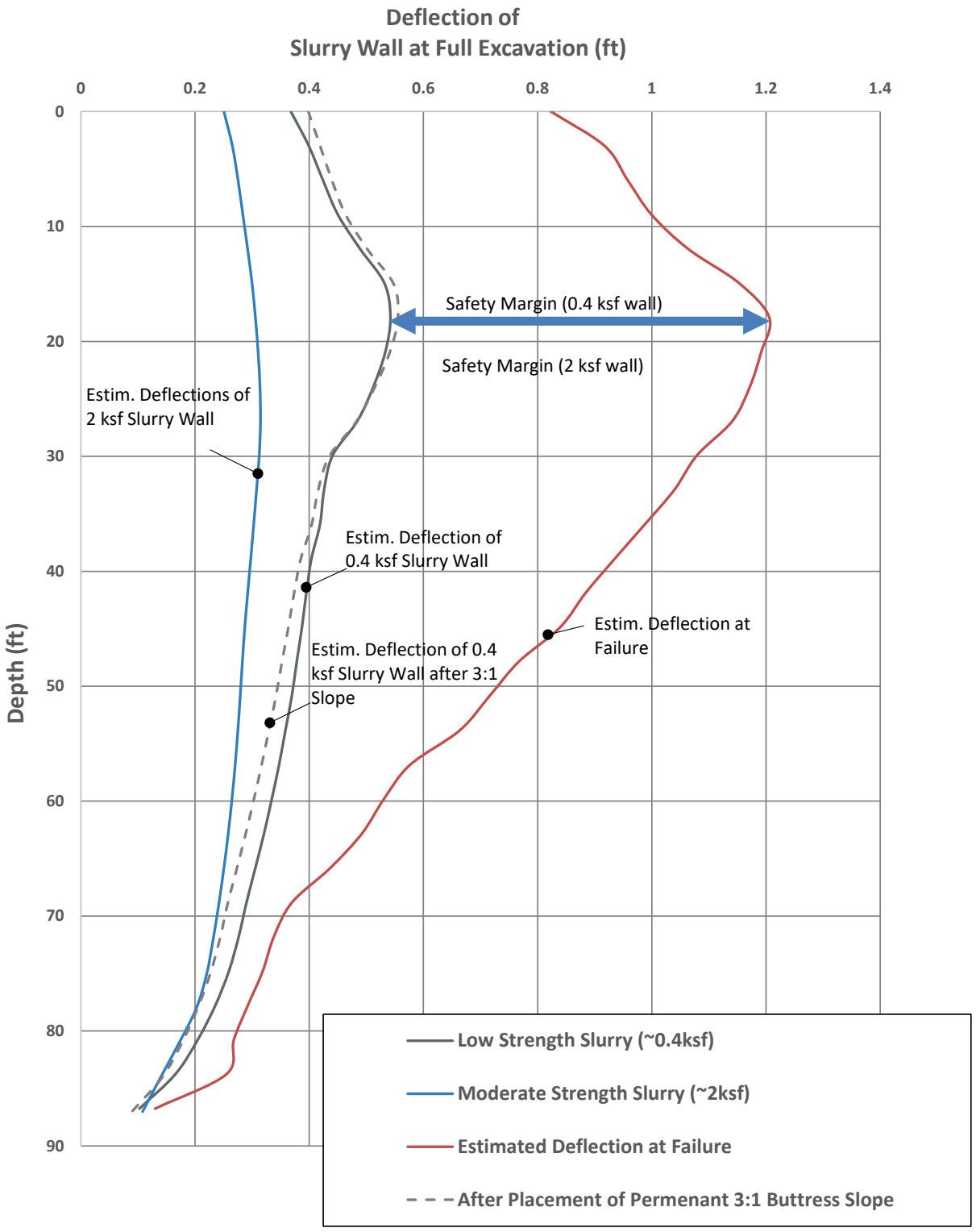
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	TITLE **ESTIMATED SLURRY WALL DEFLECTIONS DURING EXCAVATION**	DRAWING No. **13**	REV

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	TITLE **ESTIMATED DEFLECTIONS OF SLURRY WALL AT FULL EXCAVATION**	DRAWING No. **14**	REV

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ATTACHMENT A

AVAILABLE SUBSURFACE INFORMATION

- Boring Logs

- Subsurface Cross-Sections

BORING LOGS

(BSK, 2011)

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-1

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **458.0**

Location: **N 36.39334, W 119.05555**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light orange brown; medium grained; moist.										
10		… GRAVELLY SAND: Olive gray; coarse grained; moist; with cobbles, increasing to 13 ft.										
15		GP: GRAVEL: Olive gray; coarse sized; moist; with hard rounded cobbles.										
		… GRAVEL: Olive gray; coarse sized; wet; with cobbles.										
20		▽ … GRAVEL WITH COBBLES: (no recovery, very easy drilling, soil type estimated).										
25		… GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles increasing size to 4 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; cobbles to >4 in.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; coarse sized; wet; cobbles decreasing size to 2 in gravel.										
40												
45		… CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; 3 in. rounded cobbles.										
50												
55		SP: SAND: Olive gray; coarse grained; wet.										
60		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
65		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; brittle rounded cobbles.										
		… SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles increasing size to >4 in.										
70		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
75		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles size to 3 in.										
		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 20 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-2

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39318, W 119.05082**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light orange brown; medium grained; moist.										
5												
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; moist; with hard rounded coarse gravel.										
		▽										
20		… SAND WITH COBBLES: Olive gray; coarse grained; wet; with hard rounded coarse gravel.										
25		GP: GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles size to 3 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse grained; .										
35												
40		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
45												
50		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained, brittle gravel; wet.										
55		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained, brittle gravel; wet.										
60		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; .										
65		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; wet; hard cobbles to 3 in.										
70		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained; wet.										
75		… CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 17 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-3

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **465.0**

Location: **N 36.39138, W 119.04547**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light gray to white; medium grained; moist.										
5		" "										
10												
15		… SAND WITH GRAVEL: Light gray to white; coarse grained; moist; gravel increasing size. ▽										
20		GP: GRAVEL: Bluish gray; medium to coarse sized; wet.										
25		SC: CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; hard rounded 3 in. cobbles.										
30		… CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; cobbles decreasing size to 2 in. gravel.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; occasional cobbles.										
40												
45		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
50		SP: SAND WITH COBBLES: Olive brown; coarse grained; wet; cobble size>4 in.										
55		… SAND WITH COBBLES: Olive brown; coarse grained; wet; very hard drilling from 49-52 ft. … SAND: Olive brown; medium grained; wet.										
60		SC: CLAYEY SAND: Olive brown; medium grained; moist.										
65		SP: SAND: Gray; coarse grained; moist.										
70		SM: SILTY SAND: Gray; medium to coarse grained; moist.										
75		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
80		" "										
85		" "										
90		" "										
95		End of boring.										
100												

Completion Depth: **93.0**
Date Started: **11/17/11**
Date Completed: **11/17/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 93 feet. Boring backfilled with grout. Groundwater encountered at 18 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-4

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **467.0**

Location: **N 36.39336, W 119.04339**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light gray to white; medium grained; moist.										
5												
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; moist; with cobbles, increasing to 17 ft. ▽										
20		GP: SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles to>4 in.										
25		… SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles, decreasing size fine gravel.										
30												
35												
40		SC: CLAYEY SAND: Yellowish brown; medium grained; wet; with gravel.										
45		SM: SILTY SAND: Yellowish brown; medium grained; wet; with coarse gravel. … SILTY SAND: Yellowish brown; medium to coarse grained; wet; with small cobbles and coarse gravel. … SILTY SAND: Light gray to white; dry.										
50												
55												
60		SP: SAND: Olive gray; coarse grained; dry.										
65												
70		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry. " "										
75		" "										
80												
85												
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 15 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-5

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39099, W 119.04826**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light gray to white; medium grained; moist.										
10												
15		▽ GP: SANDY GRAVEL: Olive gray; coarse grained; moist; increasing gravel to small cobbles.										
20		… SANDY GRAVEL WITH COBBLES: Olive gray; coarse grained; wet; increasing cobble size to >4 in.										
25												
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 3-4 in.										
35												
40		… CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 2-3 in., decreasing to gravel.										
45		CL: SANDY CLAY WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; decreasing gravel to sand.										
50												
55		SC: CLAYEY SAND WITH GRAVEL: Yellowish brown; medium grained; wet.										
60		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
65												
70		SC: CLAYEY SAND: Olive gray; fine to medium grained; moist; very hard drilling.										
75		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
80		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
85												
90		Core barrel refusal at 87 ft. End of boring.										
95												
100												

Completion Depth: **87.0**
Date Started: **11/16/11**
Date Completed: **11/16/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 87 feet. Boring backfilled with grout. Groundwater encountered at 14 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-6

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **466.0**

Location: **N 36.38976, W 119.04018**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: POORLY GRADED SAND: Light gray to white; medium grained; moist.										
5		SW-SM: WELL GRADED SAND WITH SILT: Light gray to white; medium grained; moist.										
		▽ SW: WELL GRADED SAND: Light gray to white; fine to medium grained; wet.										
10		SP-SM: POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; fine to coarse grained with gravel; wet; with rounded cobbles to >4 in.										
15		… POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; medium to coarse grained with gravel; wet; with rounded cobbles, decreasing size.										
20		GM: SILTY GRAVEL WITH COBBLES: Olive gray; coarse sized, with fine to medium grained sand; wet; with rounded cobbles.										
25		SM: SILTY SAND: Olive gray; fine to medium grained; wet; increasing silt decreasing cobbles.										
30		… SILTY SAND: Olive gray; fine to medium grained; wet.										
		… SILTY SAND: Olive gray; medium grained; wet; with gravel.										
35		" "										
40		… SILTY SAND: Olive gray; fine to coarse grained; moist.										
45		… SILTY SAND: White & Black; fine to medium grained; moist.										
50												
55		SC: CLAYEY SAND: Bluish gray; medium grained; moist.										
60		SM: SILTY SAND: Bluish gray; medium grained; moist.										
65		" "										
70												
75		… SILTY SAND: Bluish gray; medium grained; moist; with gravel.										
80		CL: SANDY CLAY WITH GRAVEL: Bluish gray; dry; with cobbles.										
85		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
		" "										
90		" "										
		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 7 ft.

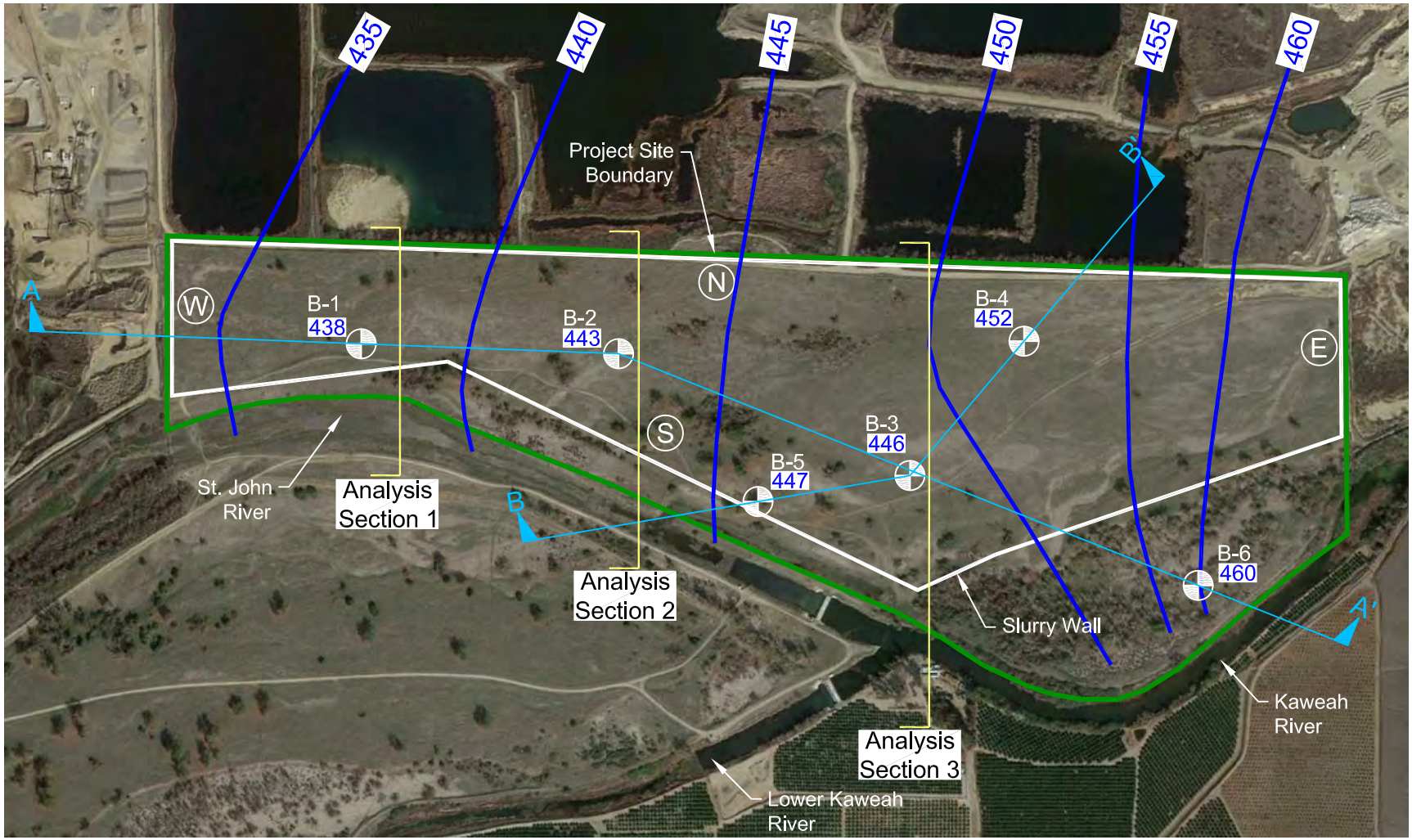
GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

SUBSURFACE CROSS-SECTIONS

(SLR, 2015)

(SES, 2012)

(SCHMIDT, 2012)



LEGEND

GEOLOGIC CROSS-SECTION A-A' & B-B'

ANALYSIS SECTION

N

0 800 1,600

SCALE (FEET)

Source: Image from Google Earth Pro

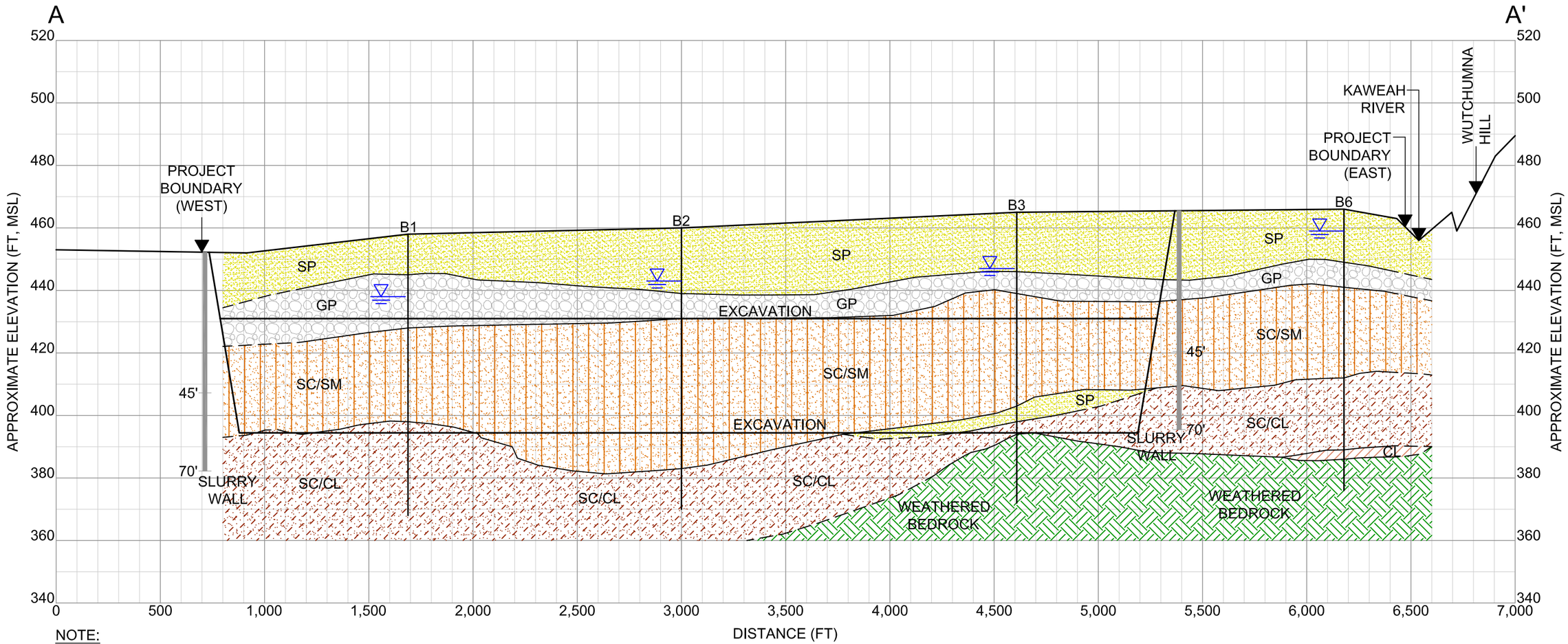
Seepage Analysis Section and Boring Location Map

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

January 2015

SLR Consulting USA Pty Ltd
Consulting Engineers & Scientists

N:\Irvine\CAD\0228-SESPE-McKay Point\04_REFERENCE\0228_Cross Sections.dwg 2/5/2015 3:24 PM



NOTE:
1. SANDOVAL DOMESTIC WELL LOCATED APPROXIMATELY 4,000 FEET WEST OF SECTION. WATER ELEVATION = 440.98

LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- CL: Clay
- GROUNDWATER ELEVATION DURING DRILLING

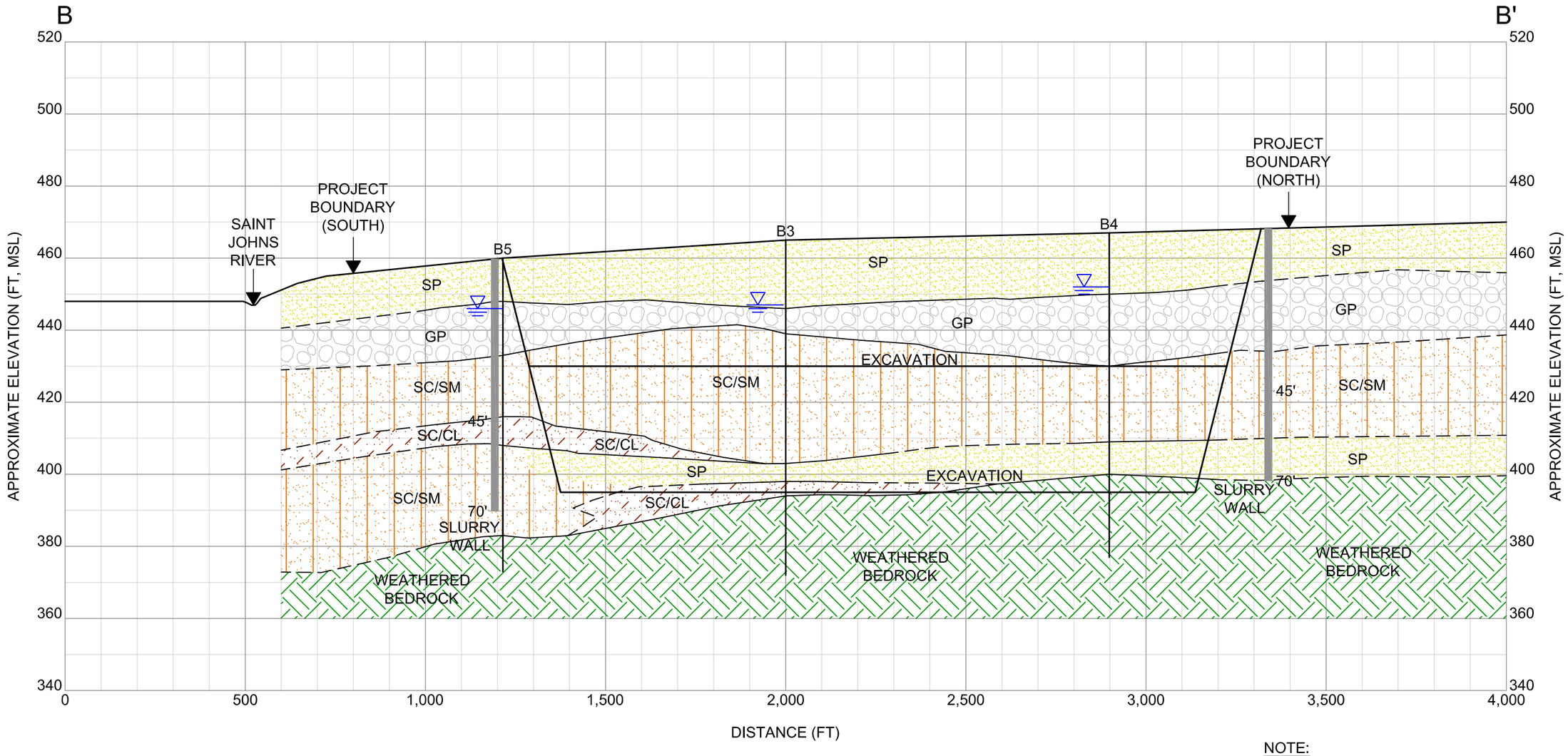
0 500 1,000
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x15

Cross Section A-A'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 2 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

P:\CAD\0228 McKay Point\0228_Cross Sections.dwg 7/11/12 13:12



LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- GROUNDWATER ELEVATION DURING DRILLING

NOTE:
1. HEIDMAN WELL LOCATED APPROXIMATELY 2,600 FEET NORTH OF SECTION. WATER ELEVATION = 460.02

0 300 600
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x10

Cross Section B-B'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 3 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

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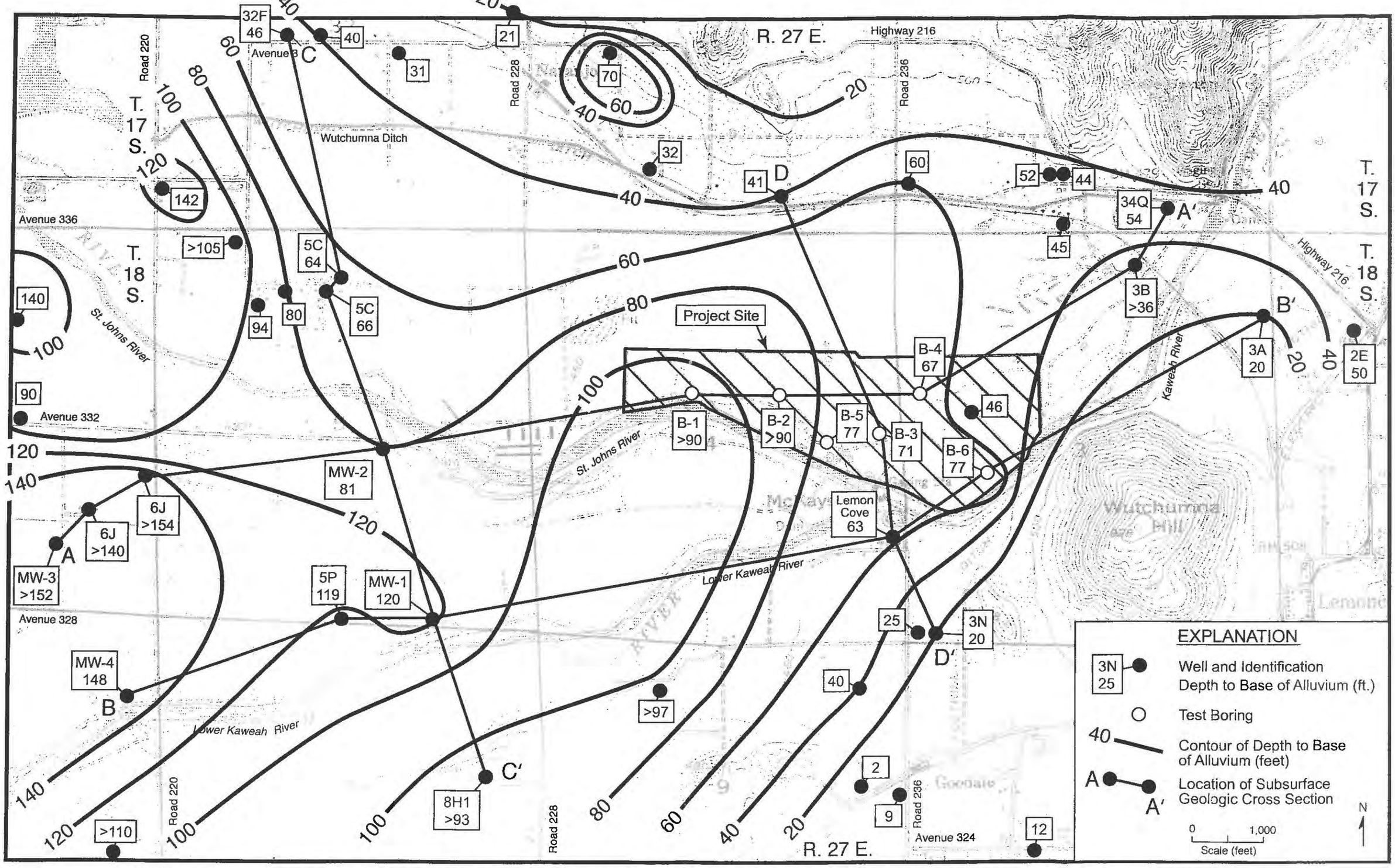


FIGURE 1 - LOCATION OF SELECTED WELLS, TEST HOLES, SUBSURFACE GEOLOGIC CROSS SECTIONS, AND DEPTH TO BASE OF ALLUVIUM

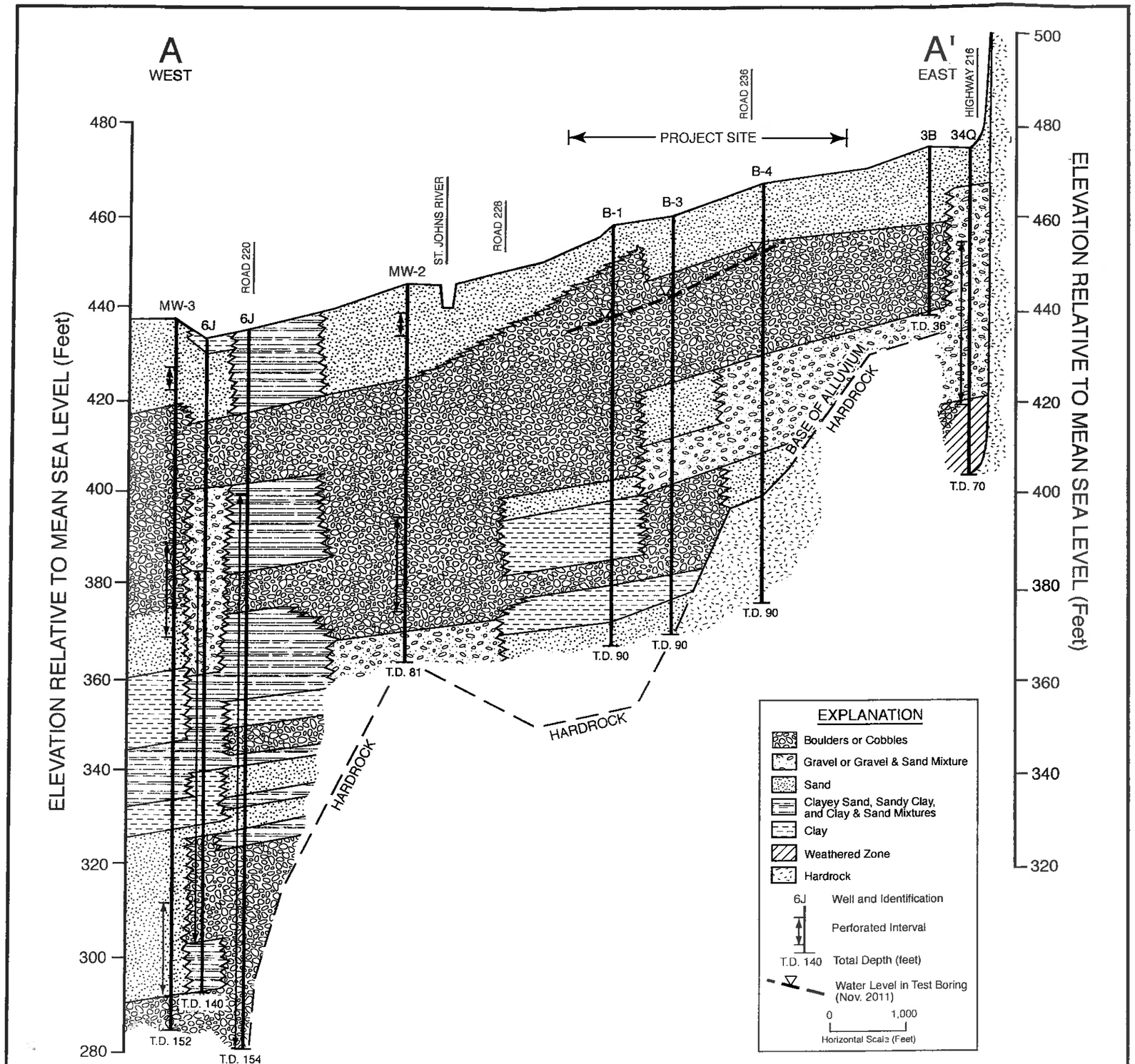


FIGURE 2 - SUBSURFACE GEOLOGIC CROSS SECTION A - A'

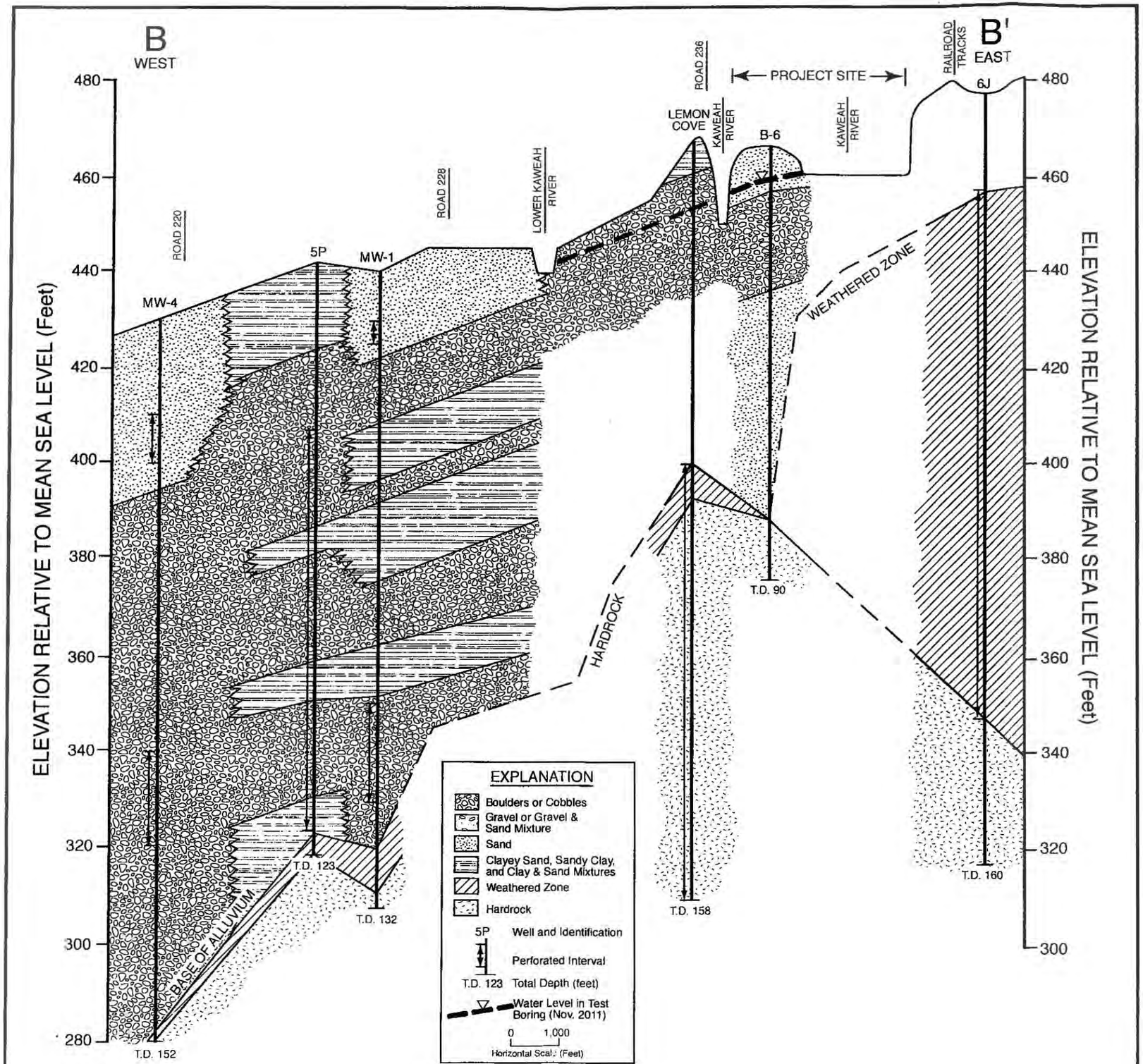


FIGURE 3 - SUBSURFACE GEOLOGIC CROSS SECTION B - B'

C
NORTH

C'
SOUTH

460
440
420
400
380
360
340
320
300
280
260

ELEVATION RELATIVE TO MEAN SEA LEVEL (Feet)

32F
WUTCHUMNA DITCH
ST. JOHNS RIVER
LOWER KAWEAH RIVER
5C 5C
MW-2
MW-1
8H1
BASE OF ALLUVIUM
TOP OF WEATHERED ZONE
TOP OF HARDROCK
WEATHERED ZONE
HARDROCK
T.D. 110
T.D. 130
T.D. 81
T.D. 93
T.D. 132
T.D. 190
O.H. 70

EXPLANATION

- Boulders or Cobbles
- Gravel or Gravel & Sand Mixture
- Sand
- Clayey Sand, Sandy Clay, and Clay & Sand Mixtures
- Clay
- Weathered Zone
- Hardrock
- 32F — Well and Identification
- Perforated Interval
- T.D. 110 — Total Depth (feet)

0 1,000
Horizontal Scale (Feet)

FIGURE 4 - SUBSURFACE GEOLOGIC CROSS SECTION C - C'

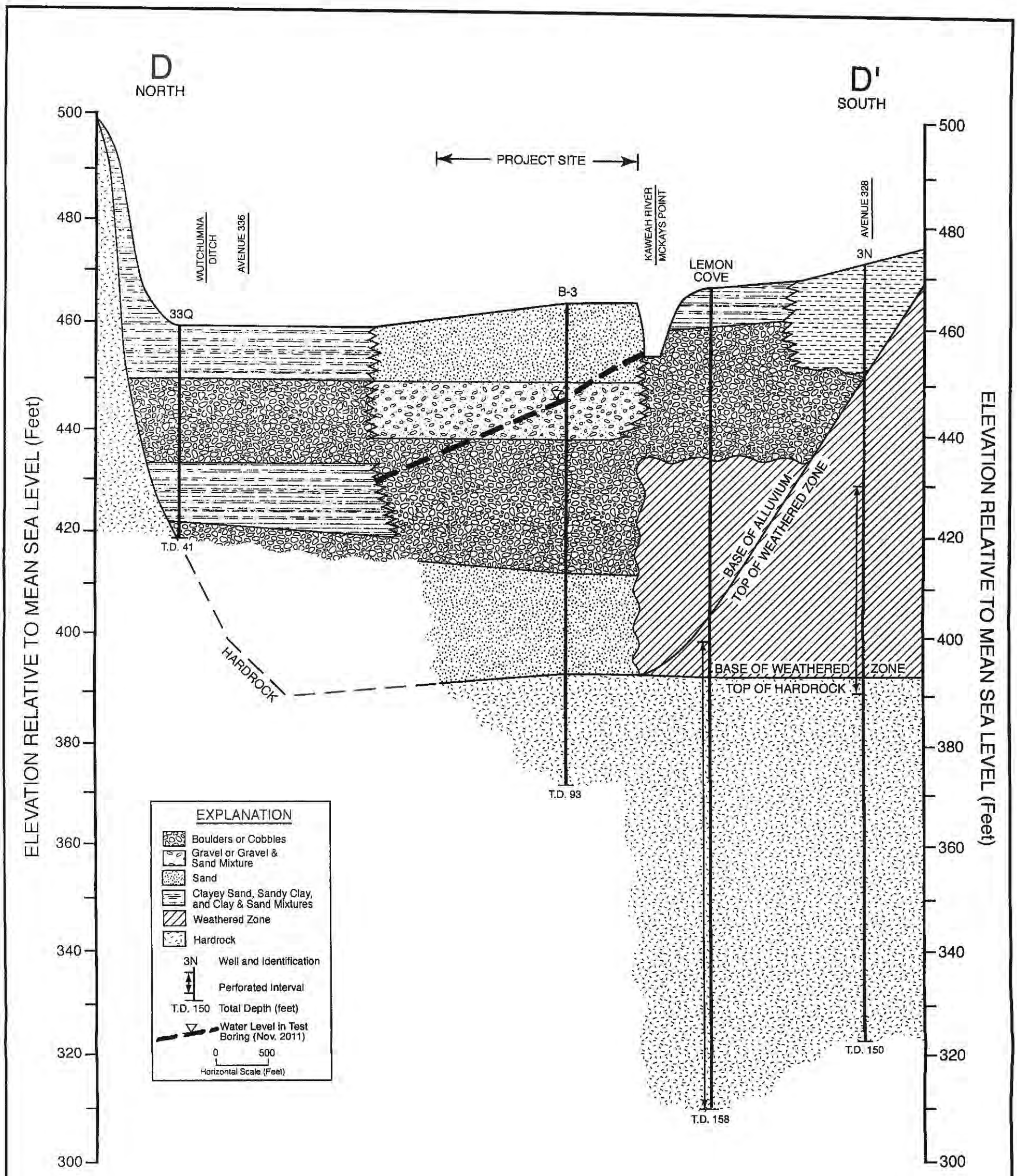
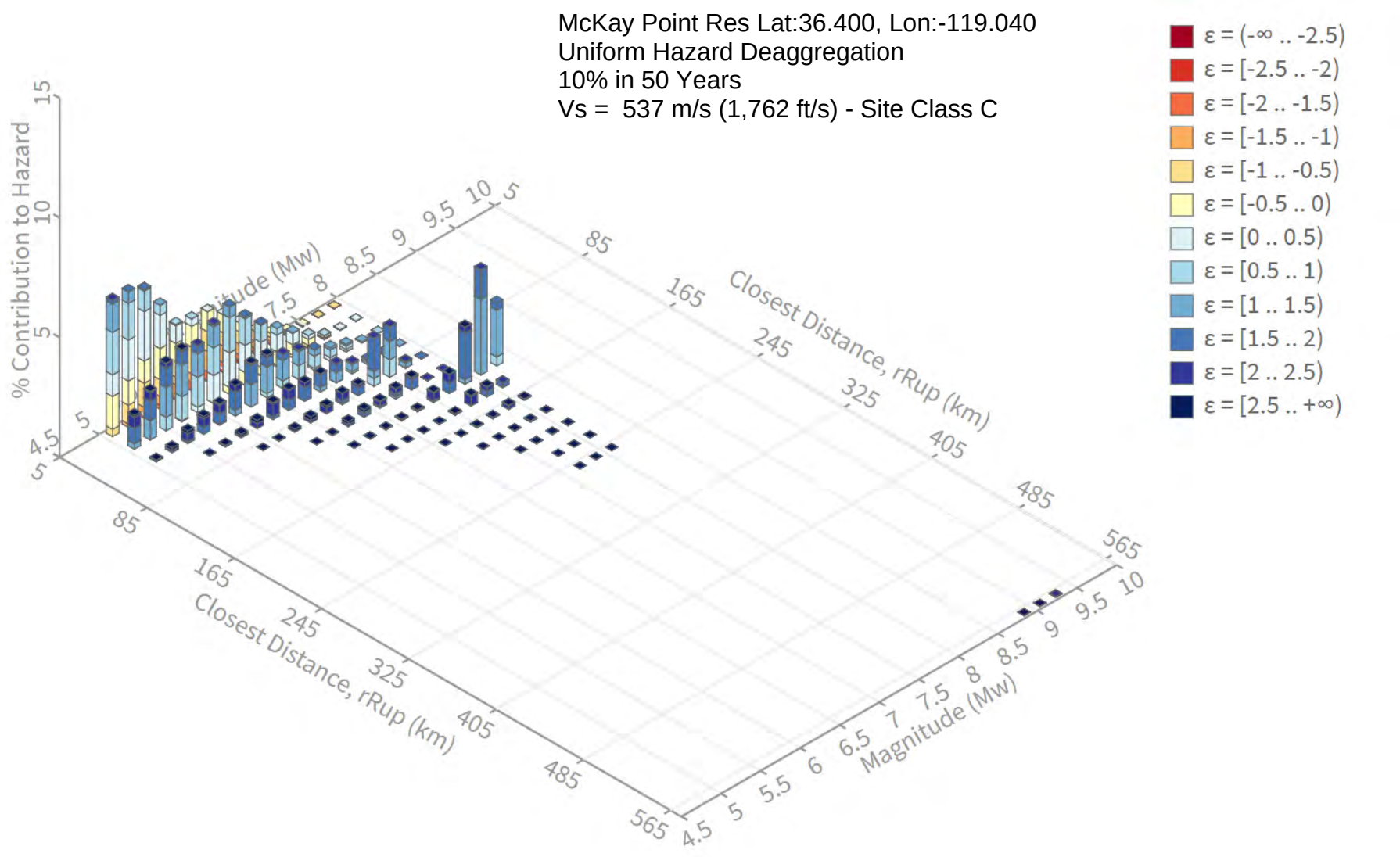


FIGURE 5 - SUBSURFACE GEOLOGIC CROSS SECTION D - D'

ATTACHMENT B

PROBABILISTIC SEISMIC HAZARD ANALYSIS (PHSA) OUTPUTS

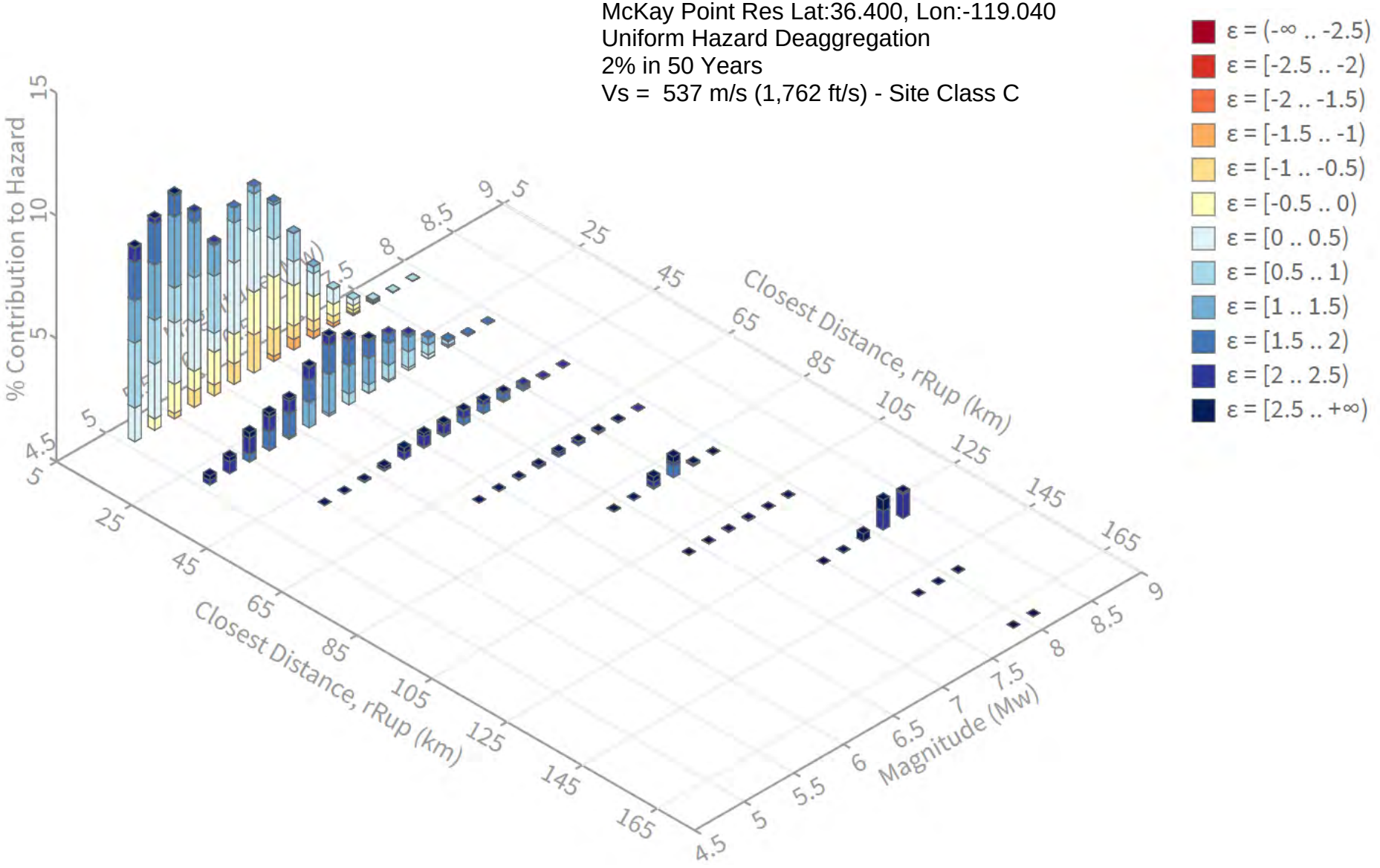
McKay Point Res Lat:36.400, Lon:-119.040
Uniform Hazard Deaggregation
10% in 50 Years
Vs = 537 m/s (1,762 ft/s) - Site Class C



Summary statistics for, Deaggregation: Total

Deaggregation targets	Recovered targets	Totals	Mean (over all sources)
Return period: 475 yrs	**Return period:** 508.96403 yrs	**Binned:** 100 %	**m:** 6.38
Exceedance rate: 0.0021052632 yr^{-1}	**Exceedance rate:** 0.0019647754 yr^{-1}	**Residual:** 0 %	**r:** 45.78 km
PGA ground motion: 0.1323948 g		**Trace:** 0.31 %	**ε_0:** 0.72 σ

McKay Point Res Lat:36.400, Lon:-119.040
Uniform Hazard Deaggregation
2% in 50 Years
Vs = 537 m/s (1,762 ft/s) - Site Class C



Summary statistics for, Deaggregation: Total

Deaggregation targets	Recovered targets	Totals	Mean (over all sources)
Return period: 2475 yrs	**Return period:** 2665.1582 yrs	**Binned:** 100 %	**m:** 6.13
Exceedance rate: 0.0004040404 yr^{-1}	**Exceedance rate:** 0.00037521225 yr^{-1}	**Residual:** 0 %	**r:** 20.52 km
PGA ground motion: 0.26089426 g		**Trace:** 0.18 %	**ε_0:** 0.83 σ

ATTACHMENT C

SLOPE AND SLURRY WALL STABILITY

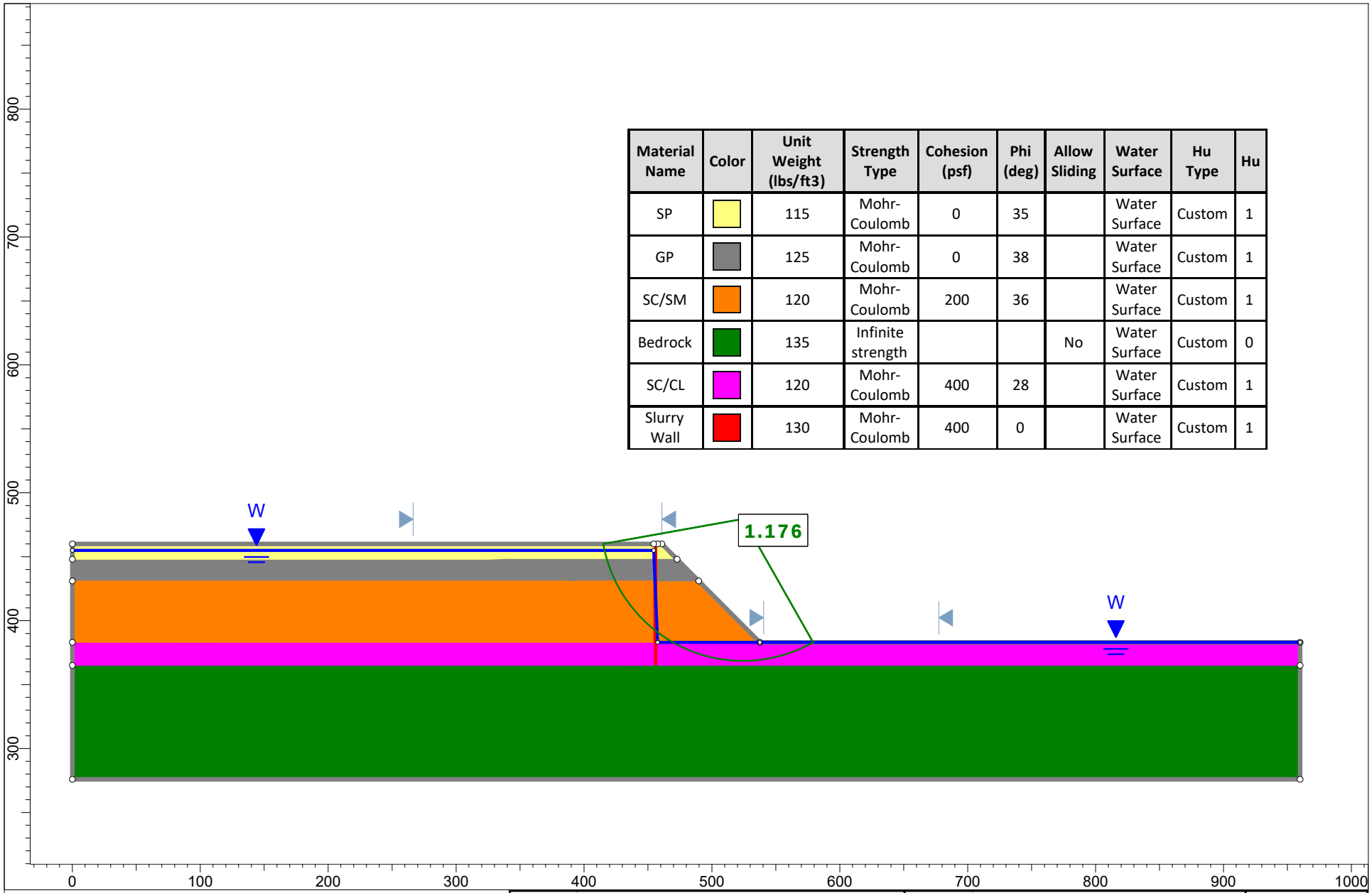
(LIMIT EQUILIBRIUM)

- **Temporary 1H:1V**
- **Temporary 1.25H:1V**
- **Temporary 1.5H:1V**
- **Permanent 3H:1V**
- **3H:1V Rapid Drawdown**
- **3H:1V Pseudostatic**

TEMPORARY

1H:1V

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1



REPORT - - - -

CLIENT SESPE CONSULTING, INC.

Date Issued DECEMBER 2021

PROVIDED BY

SLR INTERNATIONAL CORPORATION
Consulting Engineers & Scientists
17701 Cowan Suite 210
Irvine, CA 92614
Tel: (949) 553-8417

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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

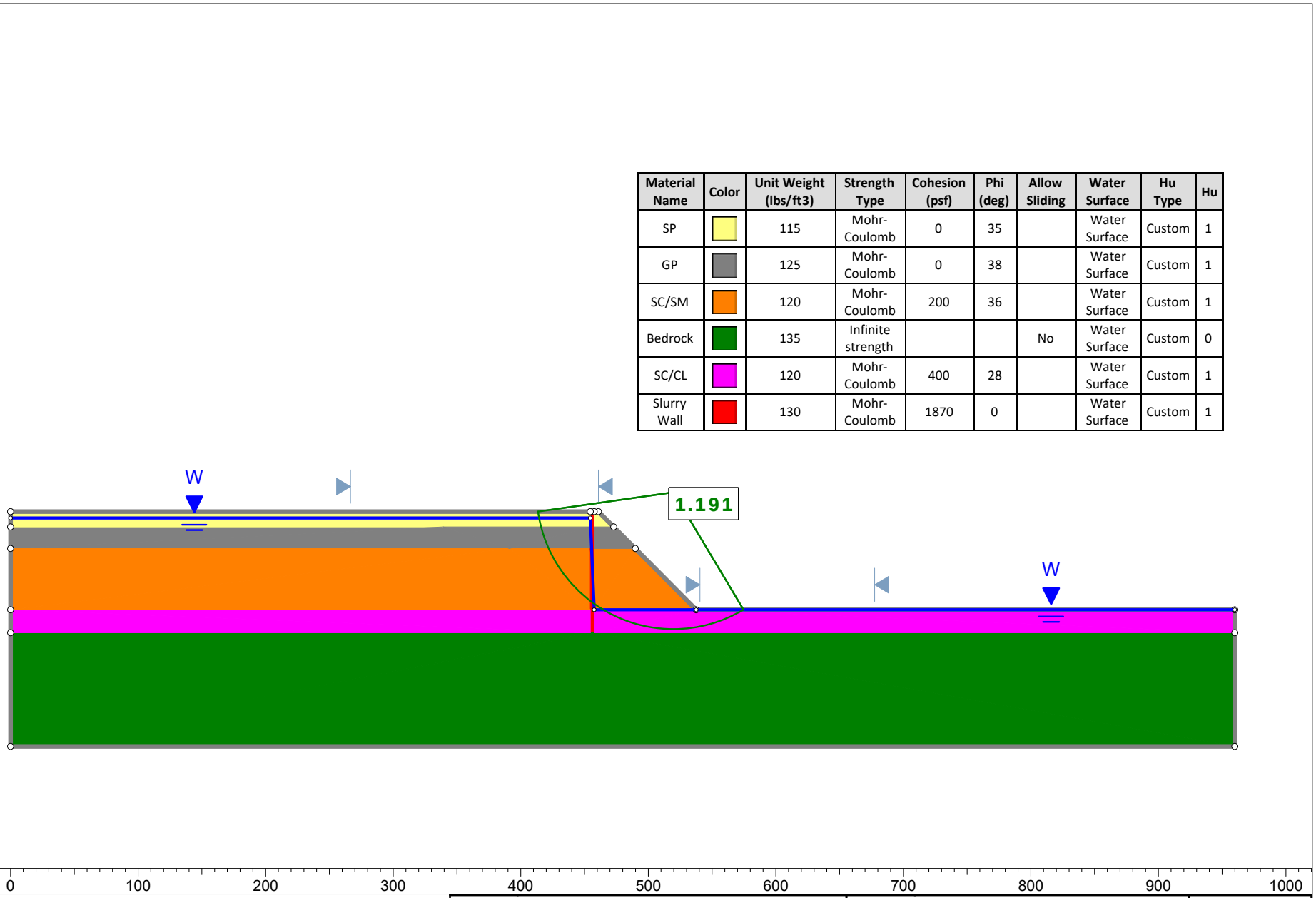
TITLE

TEMPORARY 1:1 SLOPE
FULLY DEWATERED
LOW STRENGTH SLURRY WALL

DRAWING No. C-1

REV A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1



REPORT - - - -

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CLIENT **SESPE CONSULTING, INC.**

PROJECT **MCKAY POINT RESERVOIR PROJECT**

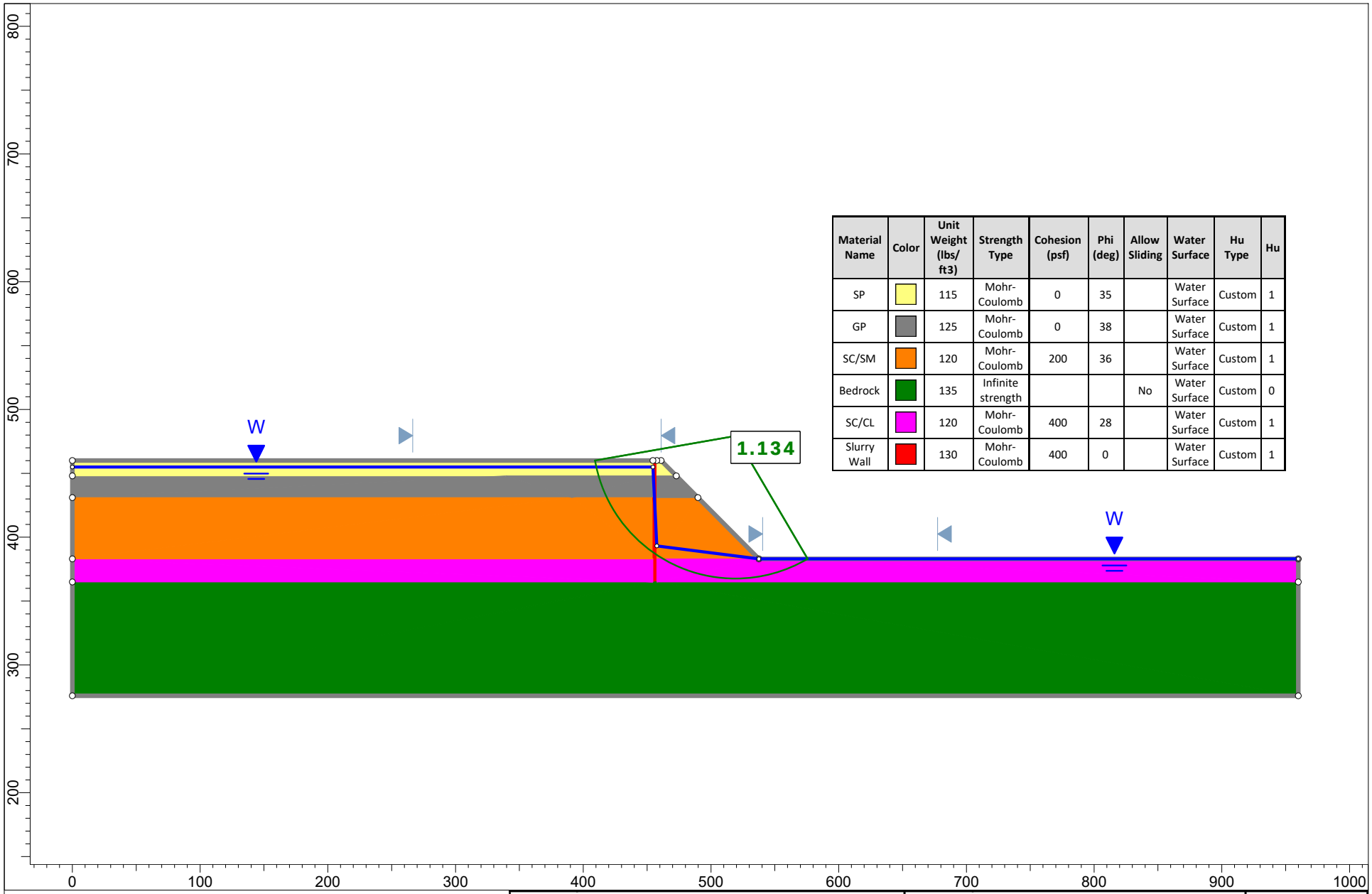
TITLE **TEMPORARY 1:1 SLOPE**
FULLY DEWATERED
MODERATE STRENGTH SLURRY WALL

Date Issued DECEMBER 2021

PROJECT NUMBER 117.02125.00002

DRAWING No. **C-2**

REV A



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

REPORT - - - -

CLIENT **SESPE CONSULTING, INC.**

Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

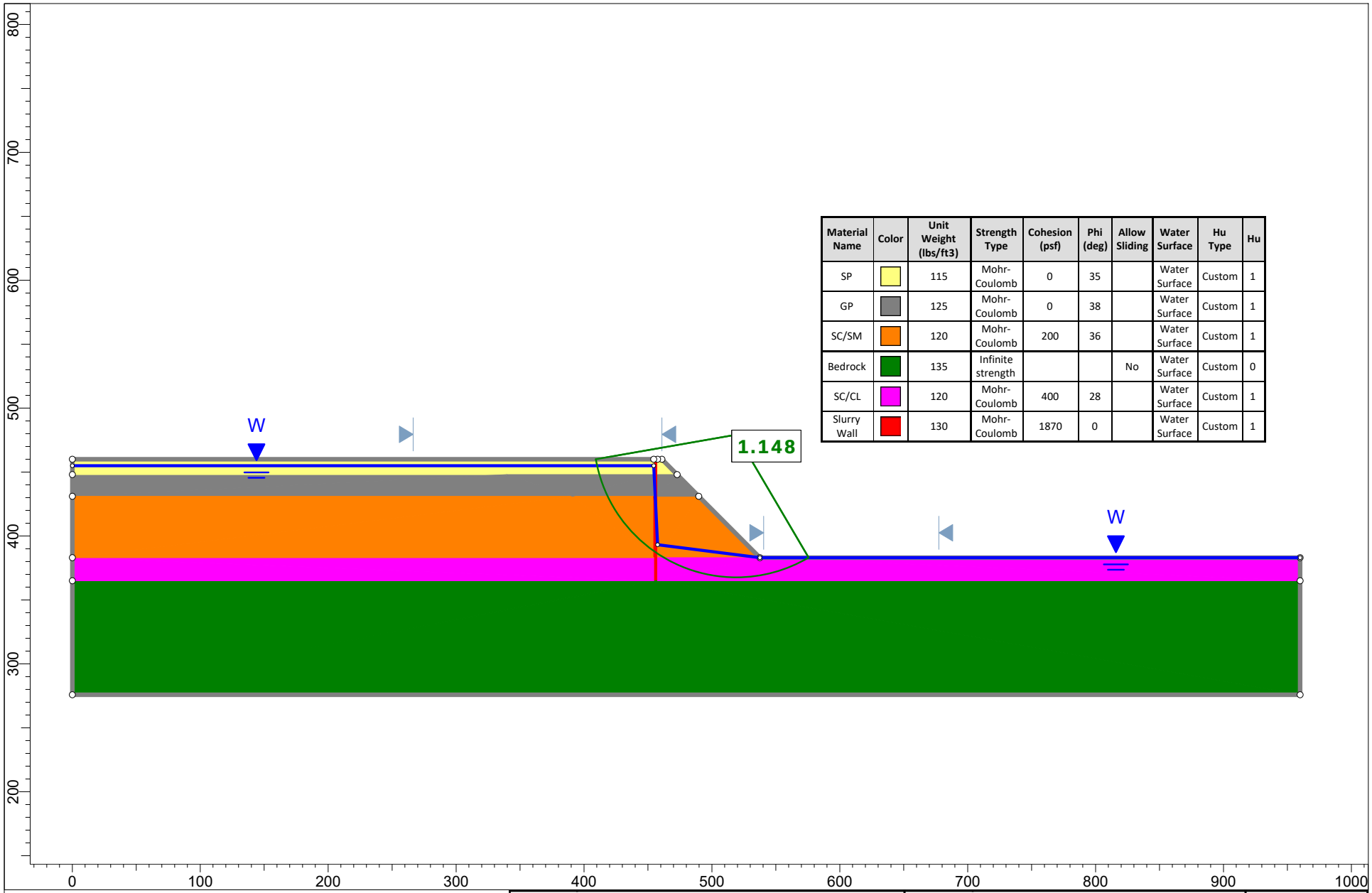
TITLE **TEMPORARY 1:1 SLOPE PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-3**

REV **A**

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

REPORT - - - -

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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

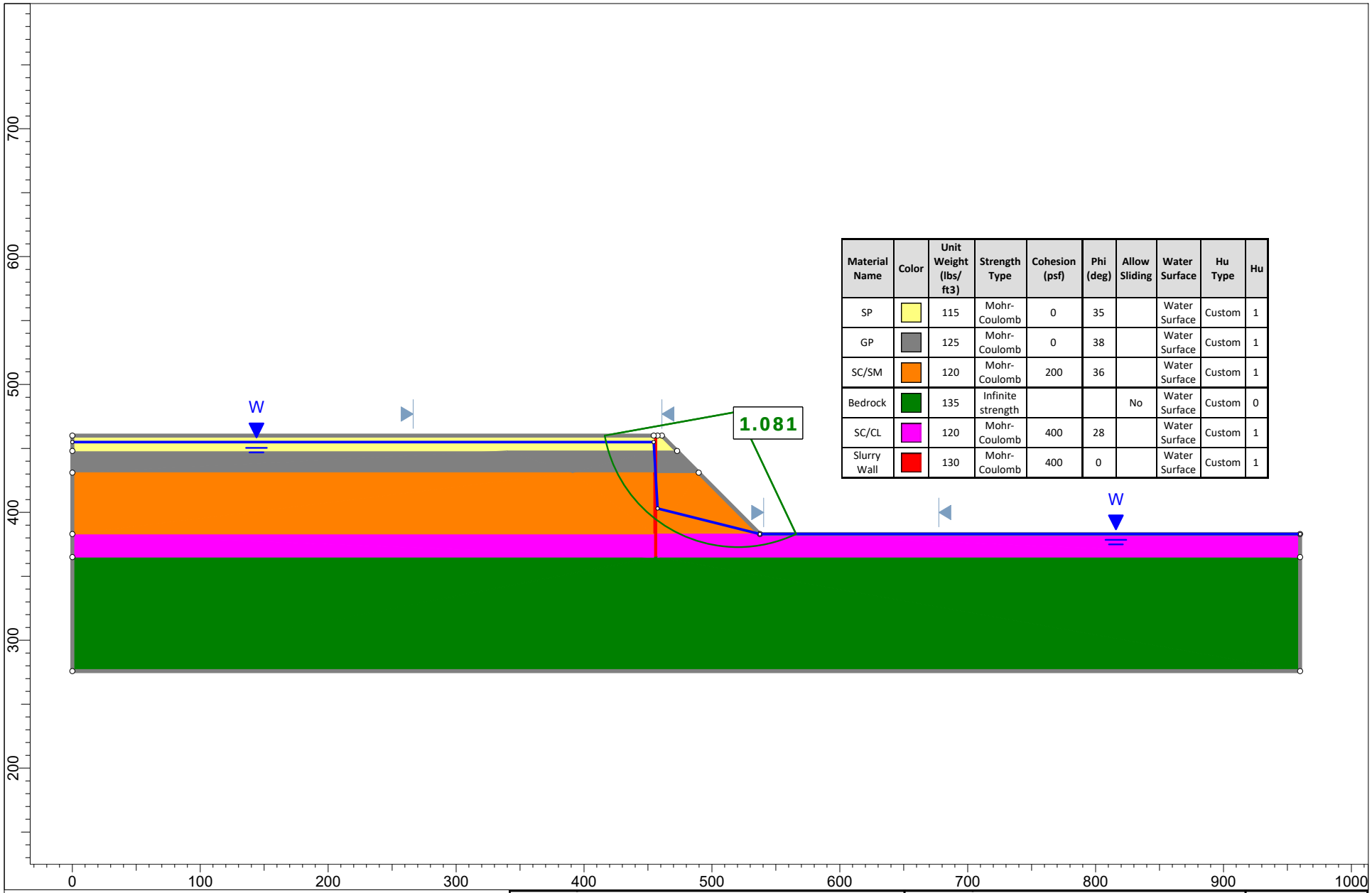
TITLE TEMPORARY 1:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-4

REV A

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Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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CLIENT: **SESPE CONSULTING, INC.**

PROJECT: **MCKAY POINT RESERVOIR PROJECT**

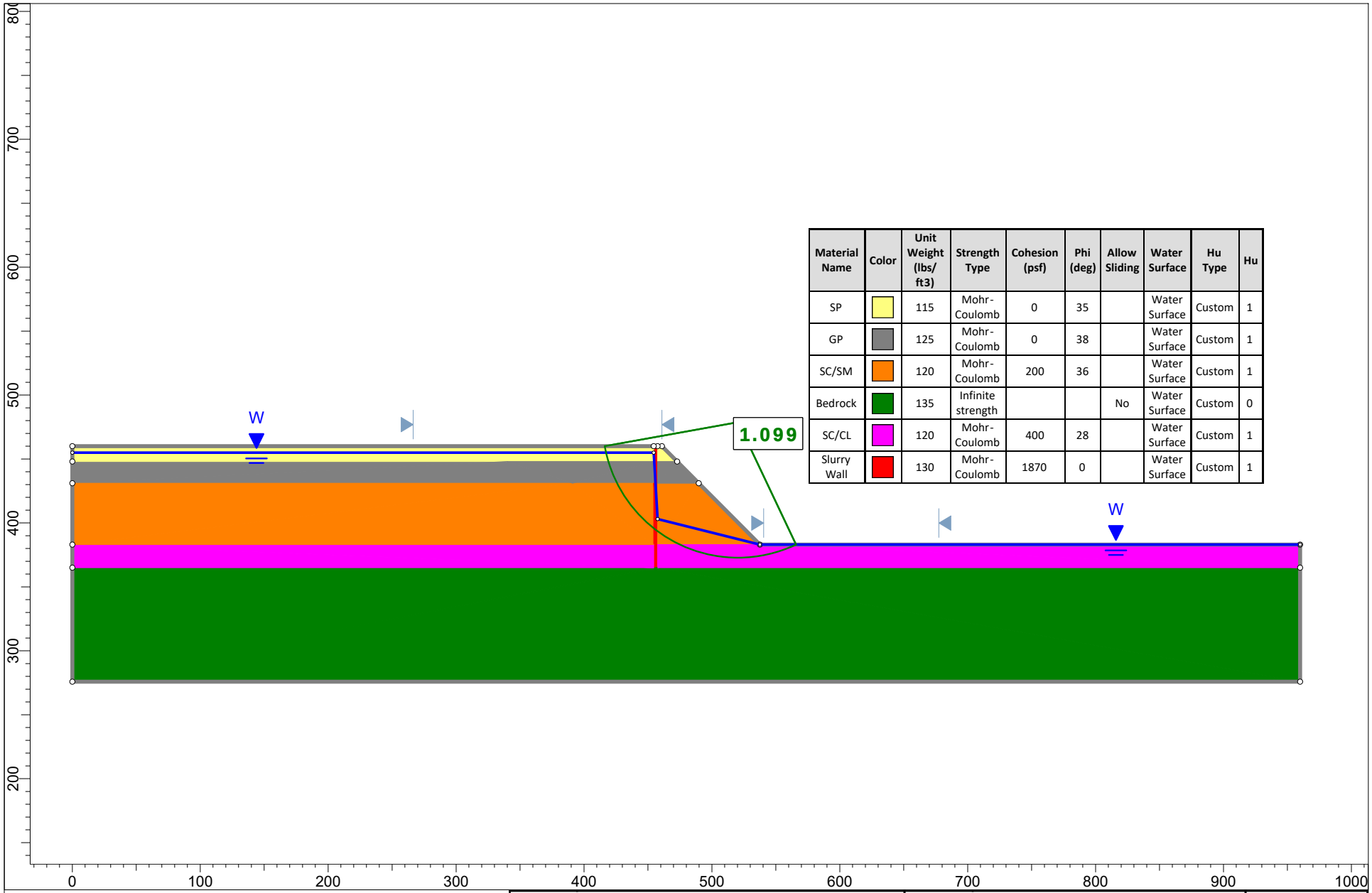
TITLE: **TEMPORARY 1:1 SLOPE**
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: **C-5**

REV: A



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

REPORT - - - -

CLIENT **SESPE CONSULTING, INC.**

Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1:1 SLOPE PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM MODERATE STRENGTH SLURRY WALL**

DRAWING No. **C-6**

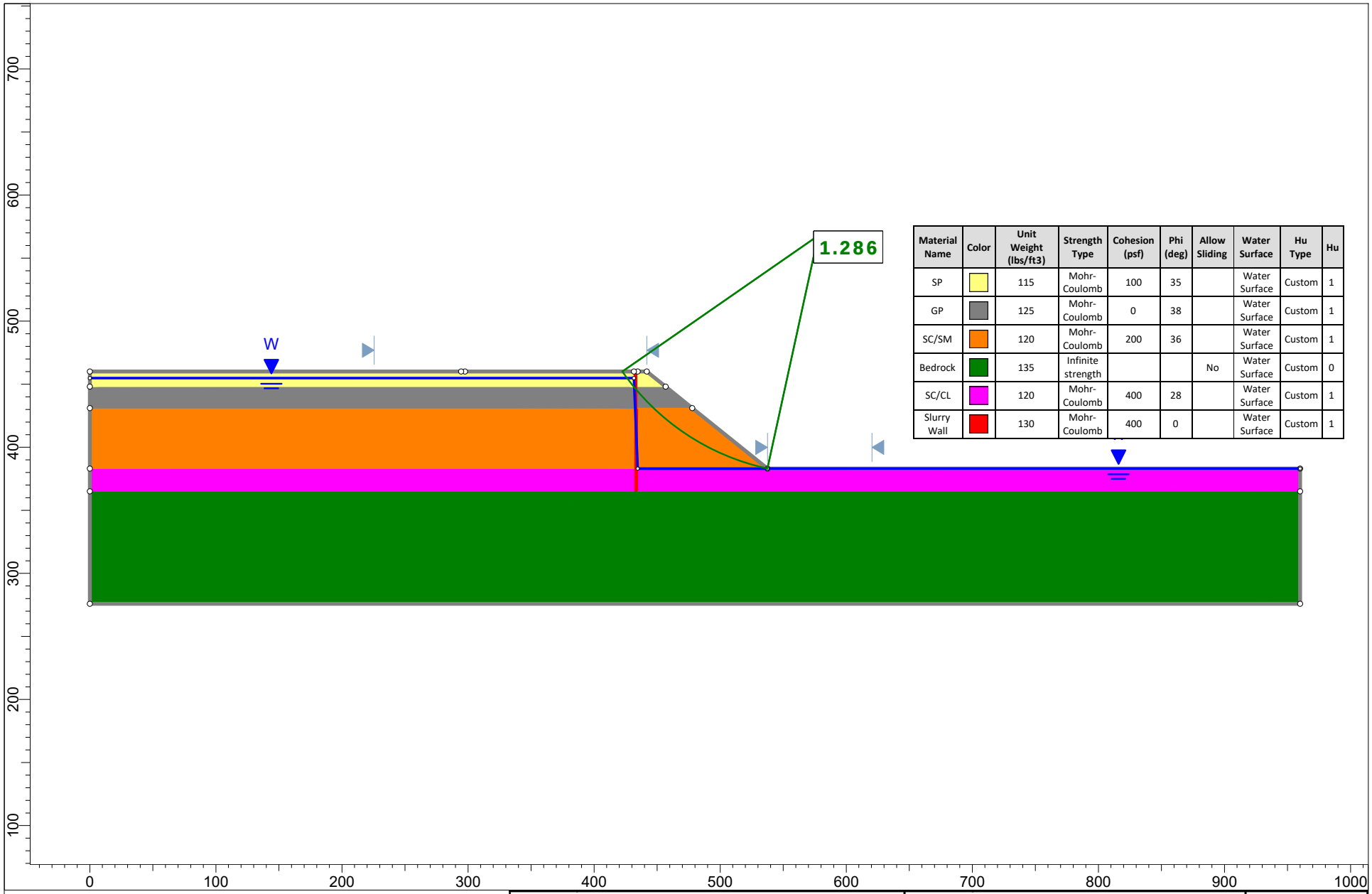
REV **A**

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TEMPORARY

1.25H:1V



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

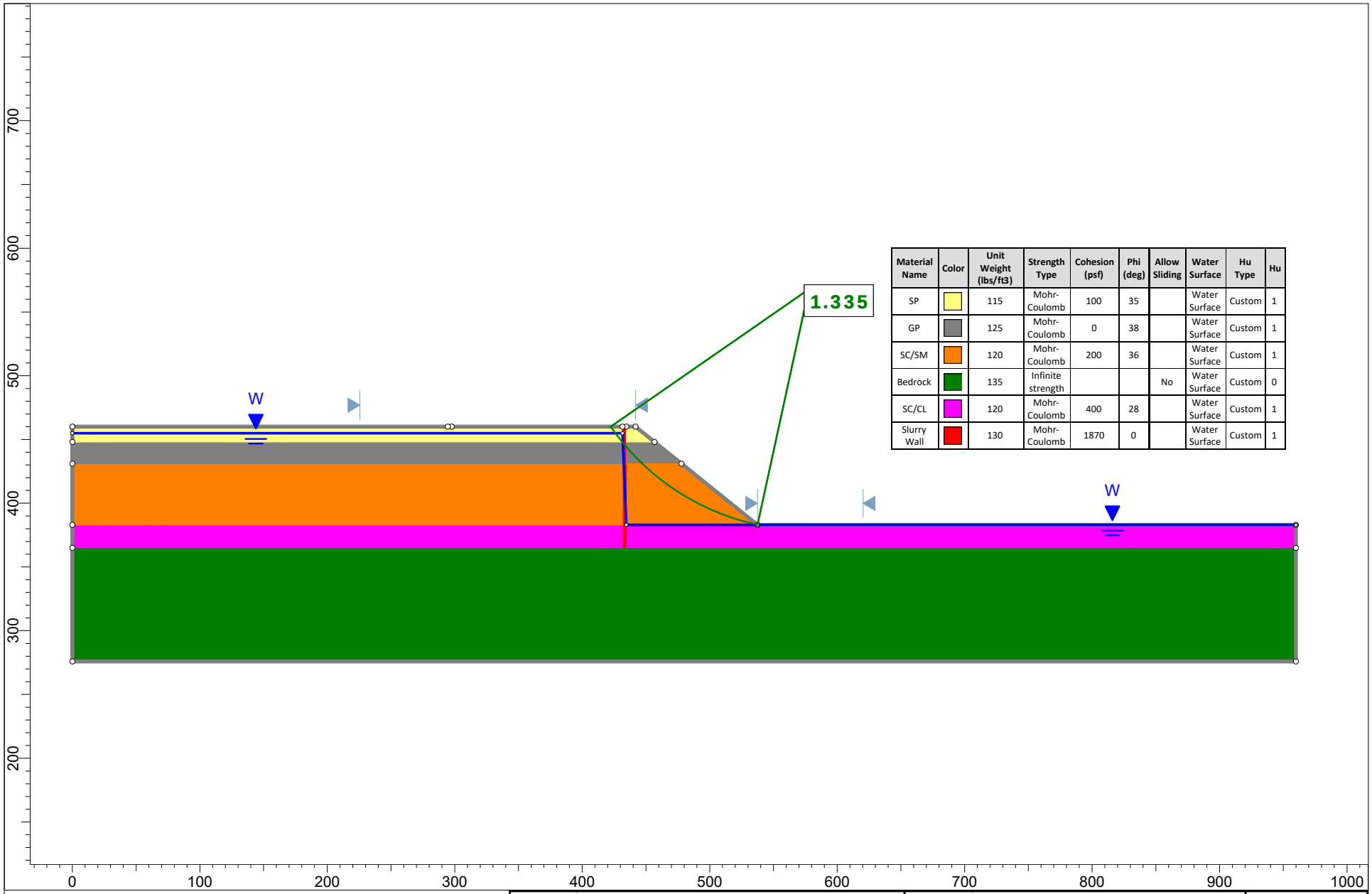
TITLE **TEMPORARY 1.25:1 SLOPE FULLY DEWATERED LOW STRENGTH SLURRY WALL**

DRAWING No. **C-7**

REV **A**

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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CLIENT **SESPE CONSULTING, INC.**

PROJECT **MCKAY POINT RESERVOIR PROJECT**

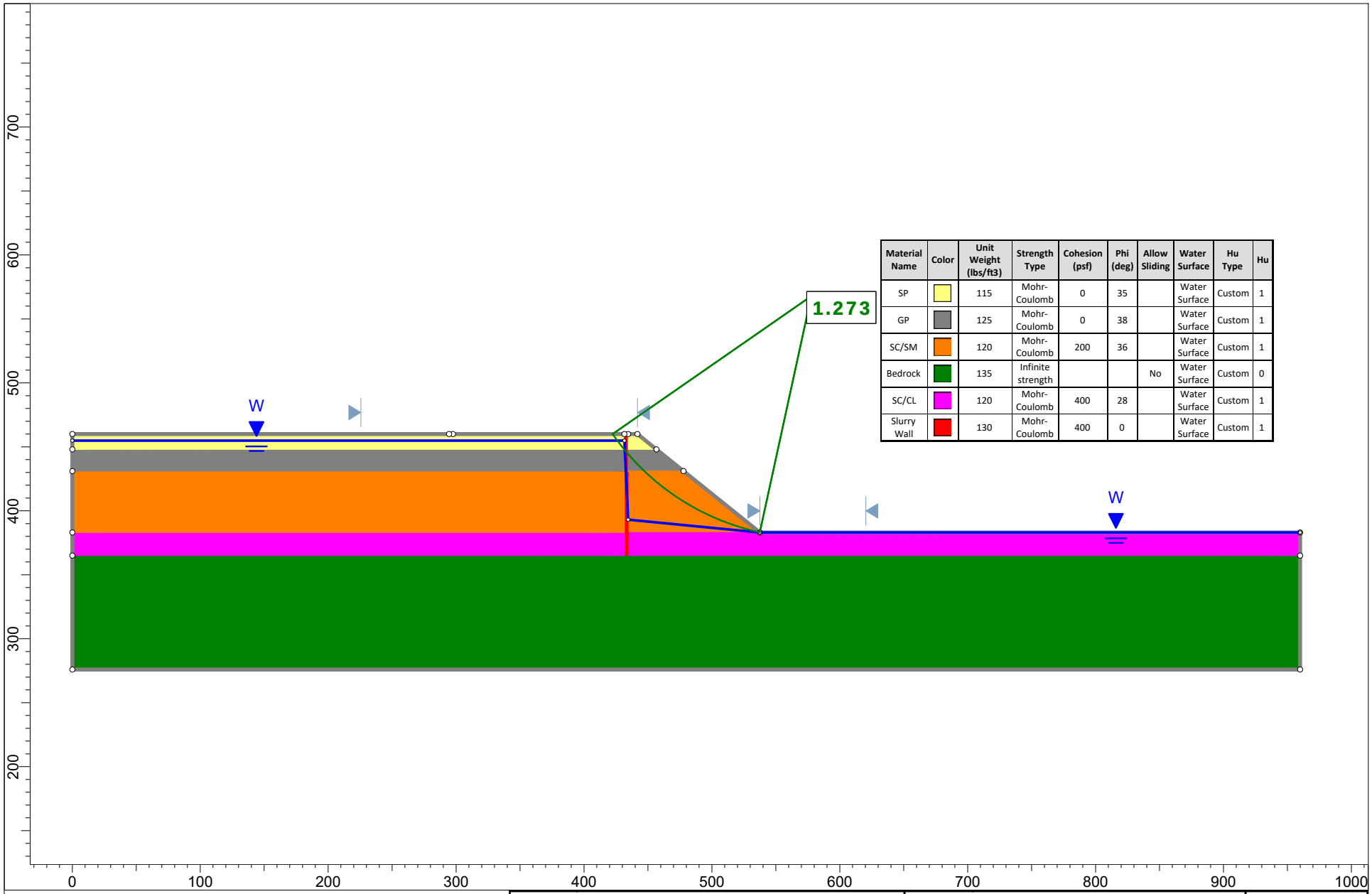
TITLE **TEMPORARY 1.25:1 SLOPE**
FULLY DEWATERED
MODERATE STRENGTH SLURRY WALL

Date Issued DECEMBER 2021

PROJECT NUMBER 117.02125.00002

DRAWING No. **C-8**

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

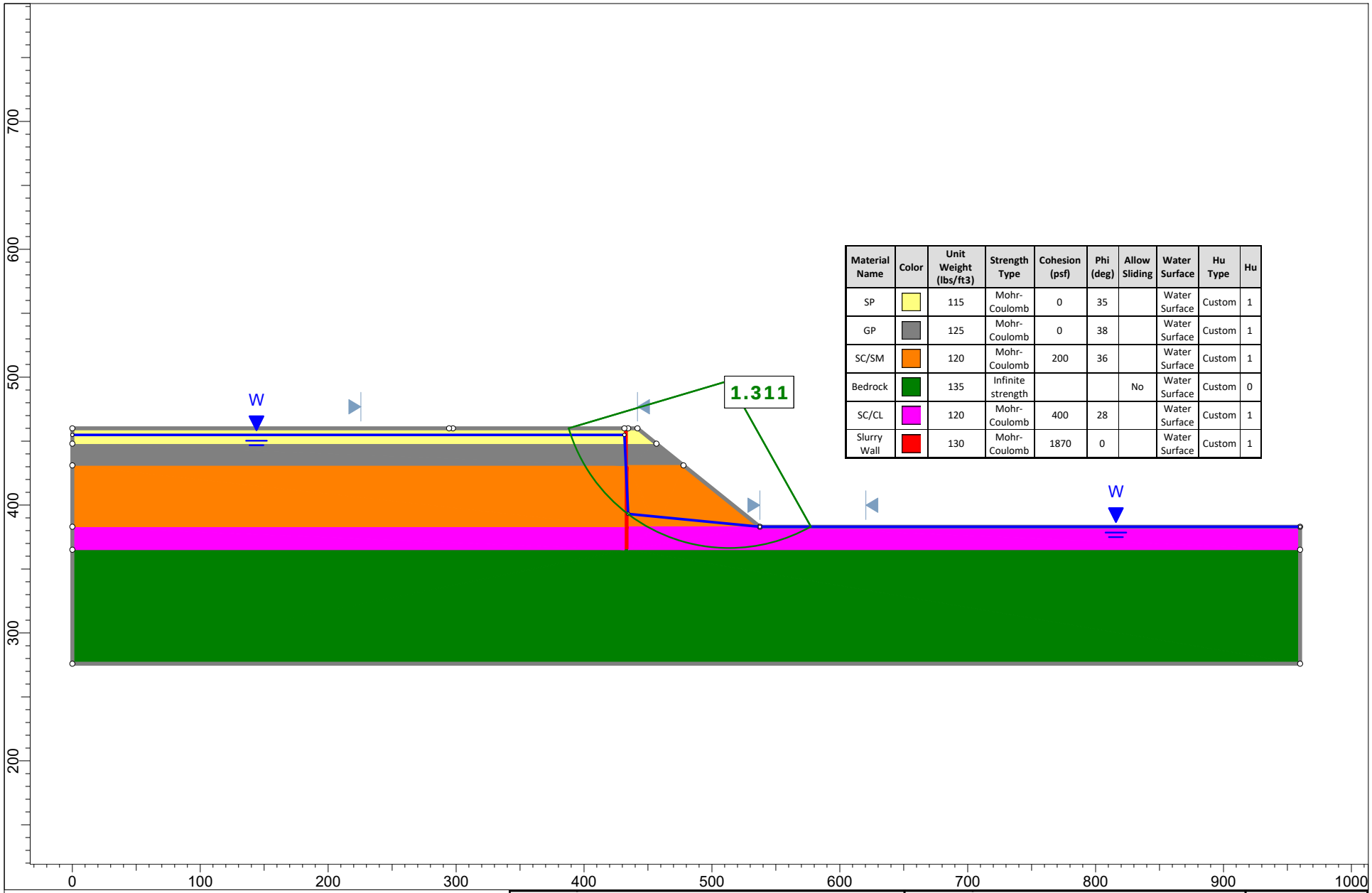
TITLE **TEMPORARY 1.25:1 SLOPE PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-9**

REV A

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

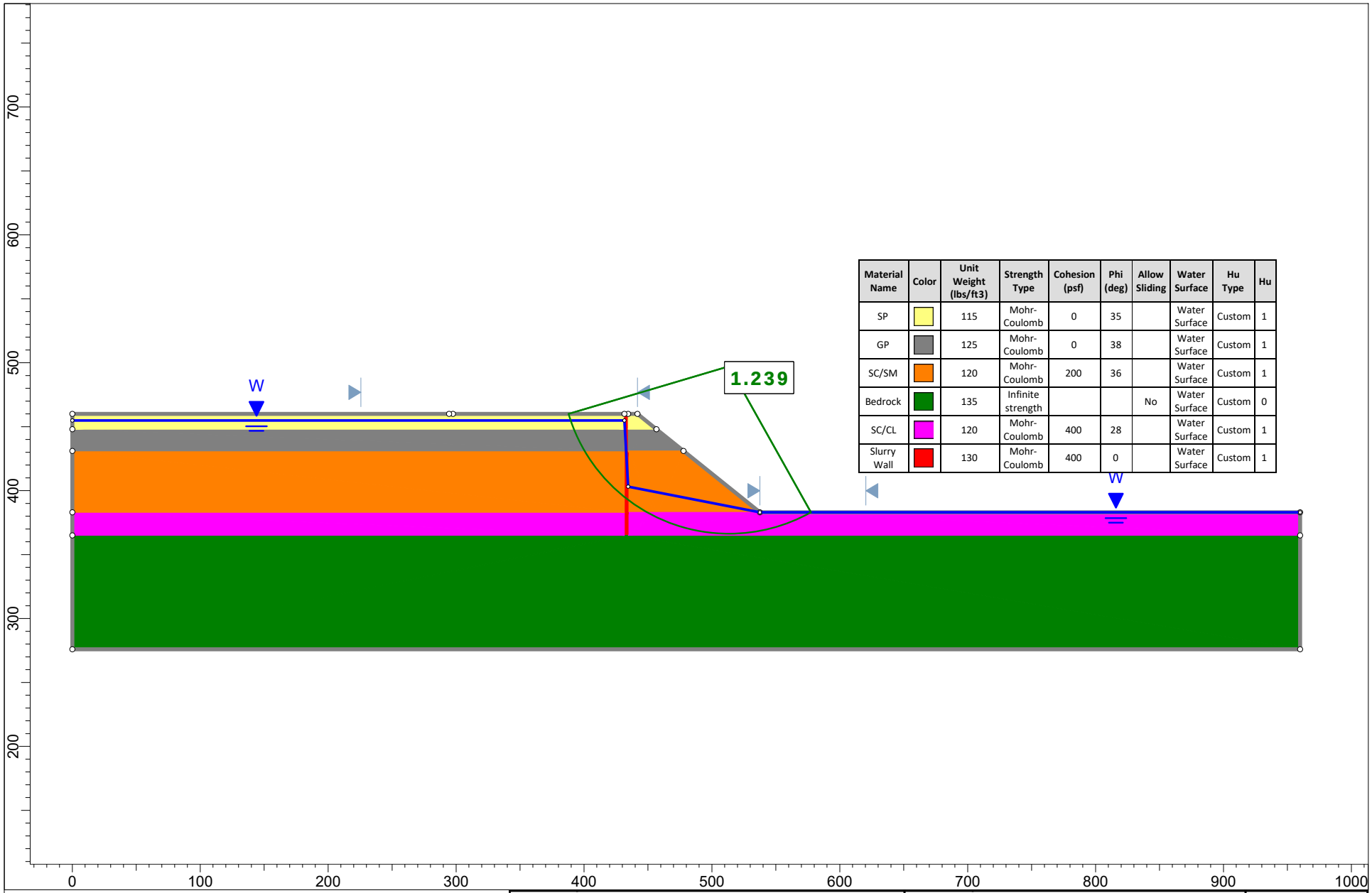
TITLE TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-10

REV A

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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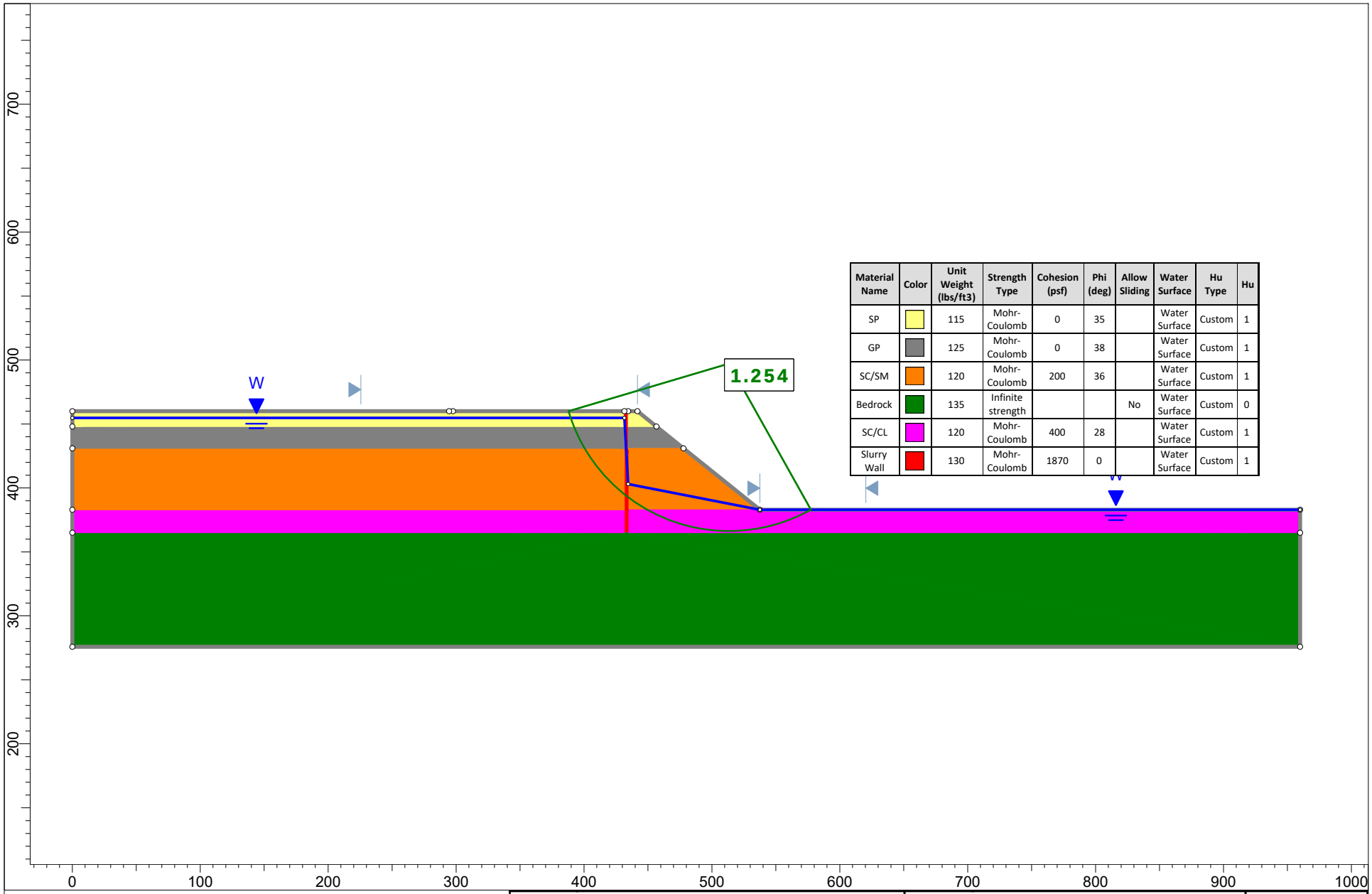
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

DRAWING No. C-11

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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PROJECT: **MCKAY POINT RESERVOIR PROJECT**

TITLE: **TEMPORARY 1.25:1 SLOPE**
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

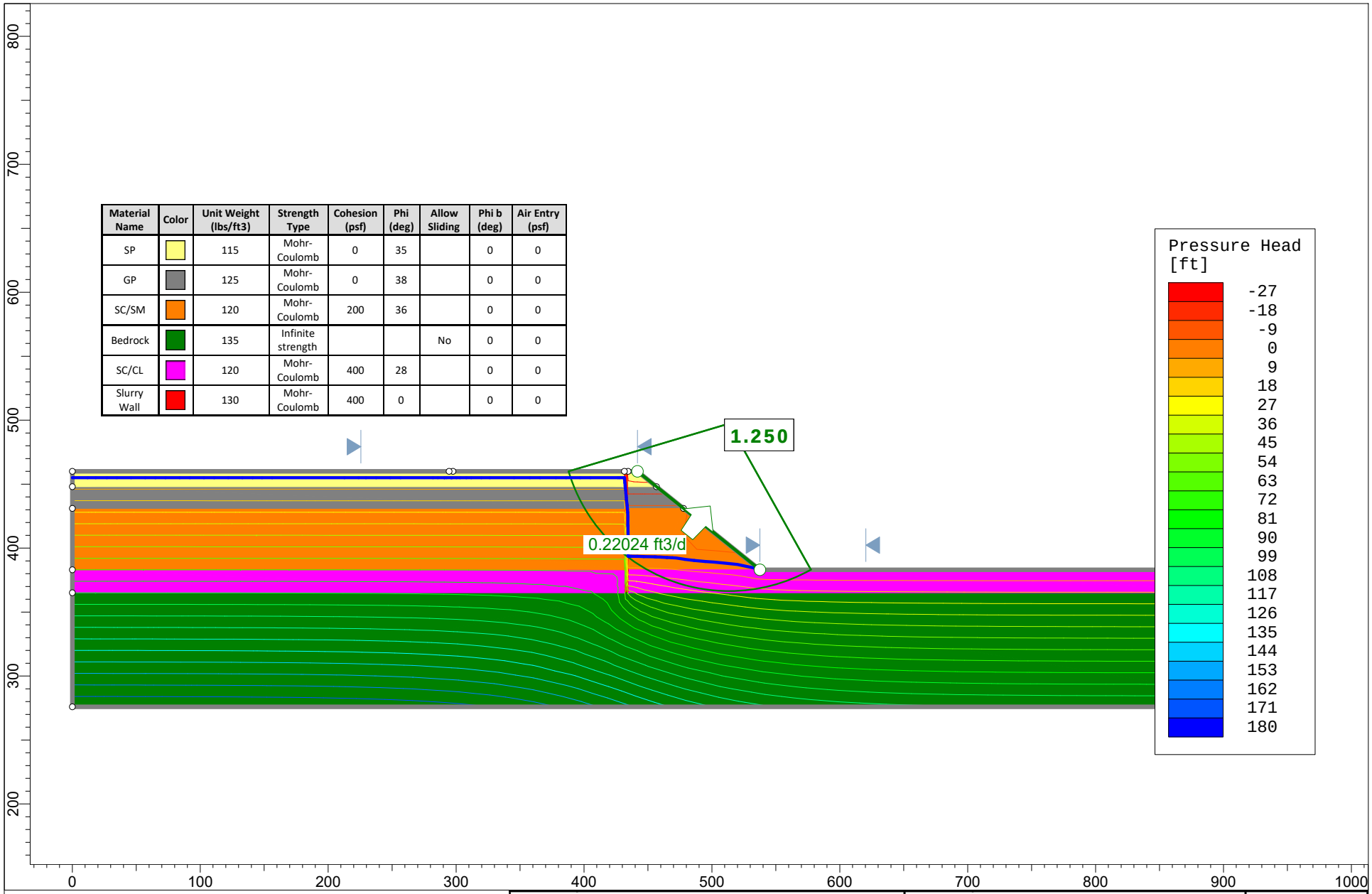
Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: **C-12**

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35		0	0
GP		125	Mohr-Coulomb	0	38		0	0
SC/SM		120	Mohr-Coulomb	200	36		0	0
Bedrock		135	Infinite strength			No	0	0
SC/CL		120	Mohr-Coulomb	400	28		0	0
Slurry Wall		130	Mohr-Coulomb	400	0		0	0



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CLIENT **SESPE CONSULTING, INC.**

PROJECT **MCKAY POINT RESERVOIR PROJECT**

TITLE **TEMPORARY 1.25:1 SLOPE**
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

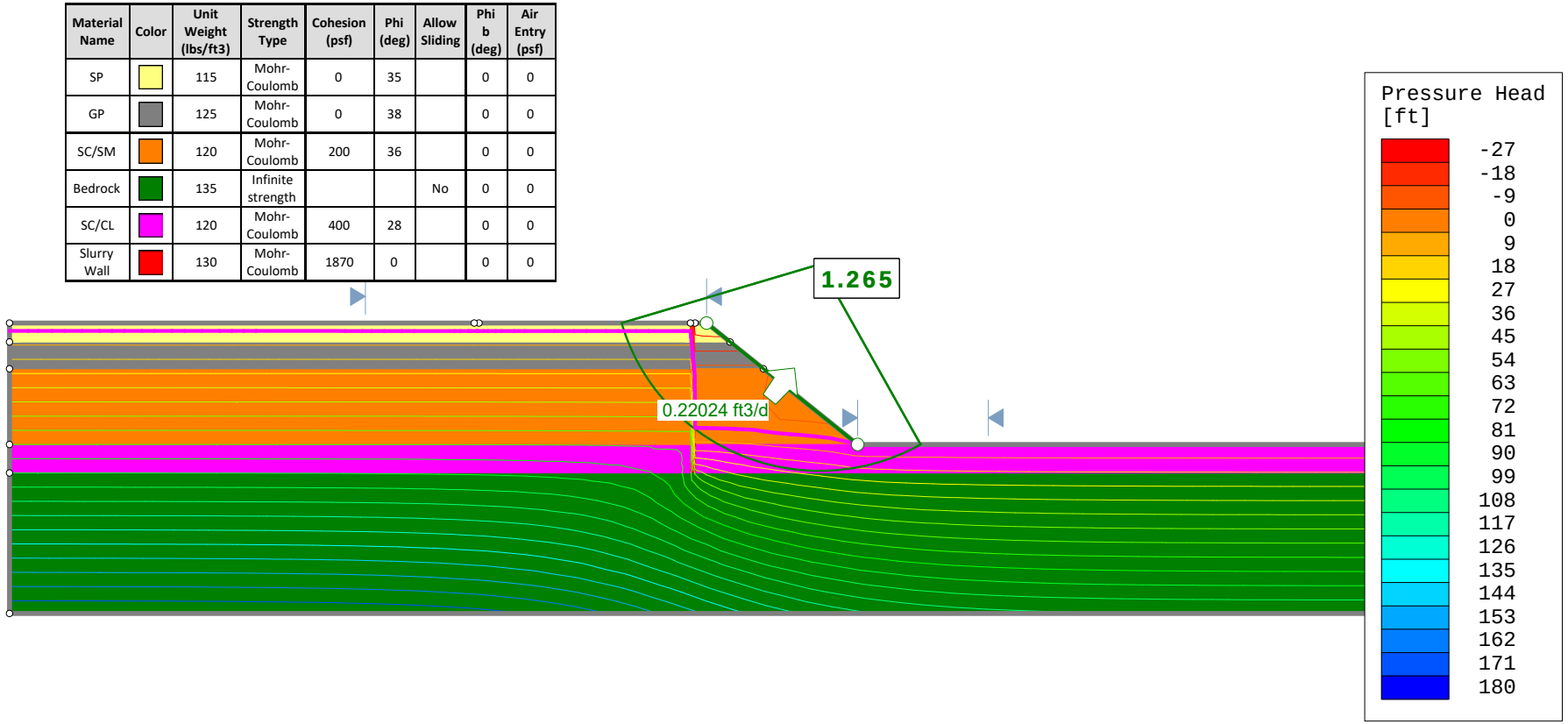
Date Issued DECEMBER 2021

PROJECT NUMBER 117.02125.00002

DRAWING No. **C-13**

REV **A**

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35		0	0
GP		125	Mohr-Coulomb	0	38		0	0
SC/SM		120	Mohr-Coulomb	200	36		0	0
Bedrock		135	Infinite strength			No	0	0
SC/CL		120	Mohr-Coulomb	400	28		0	0
Slurry Wall		130	Mohr-Coulomb	1870	0		0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: TEMPORARY 1.25:1 SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

Date Issued: DECEMBER 2021

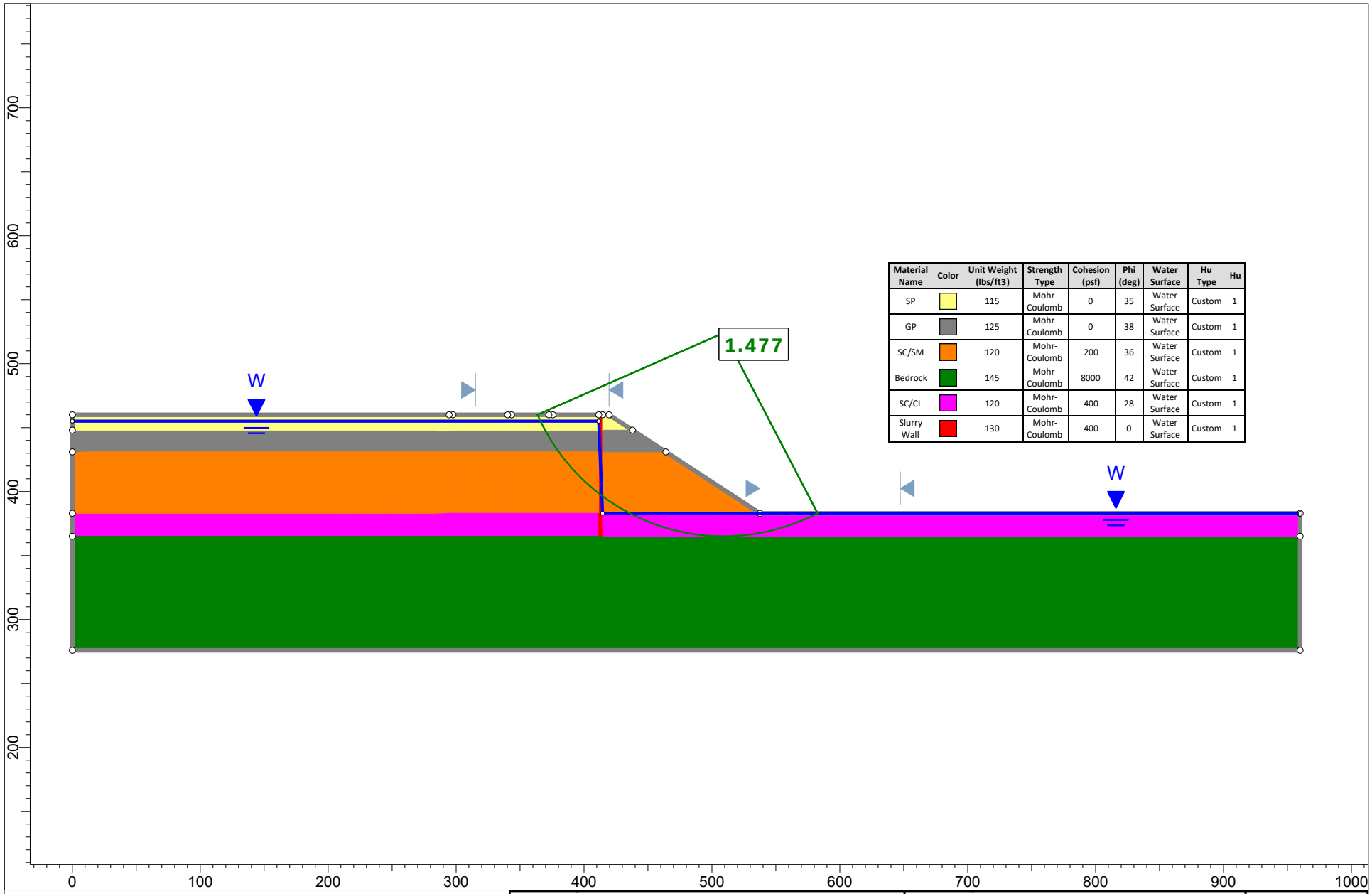
PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-14

REV: A

TEMPORARY

1.5H:1V



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1

REPORT - - - -

CLIENT **SESPE CONSULTING, INC.**

Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

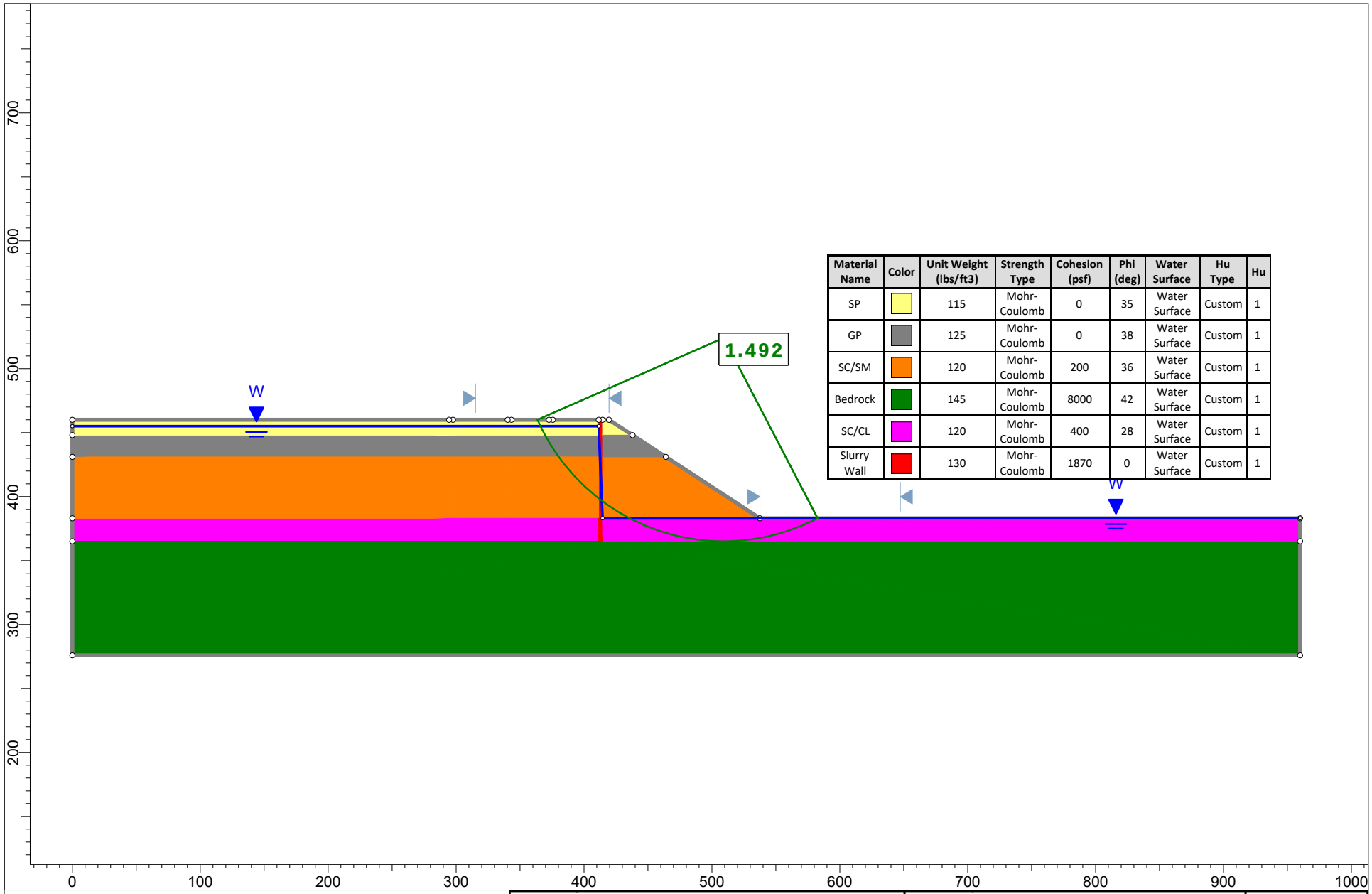
TITLE **TEMPORARY 1.5:1 SLOPE FULLY DEWATERED LOW STRENGTH SLURRY WALL**

DRAWING No. **C-15**

REV A

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1

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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

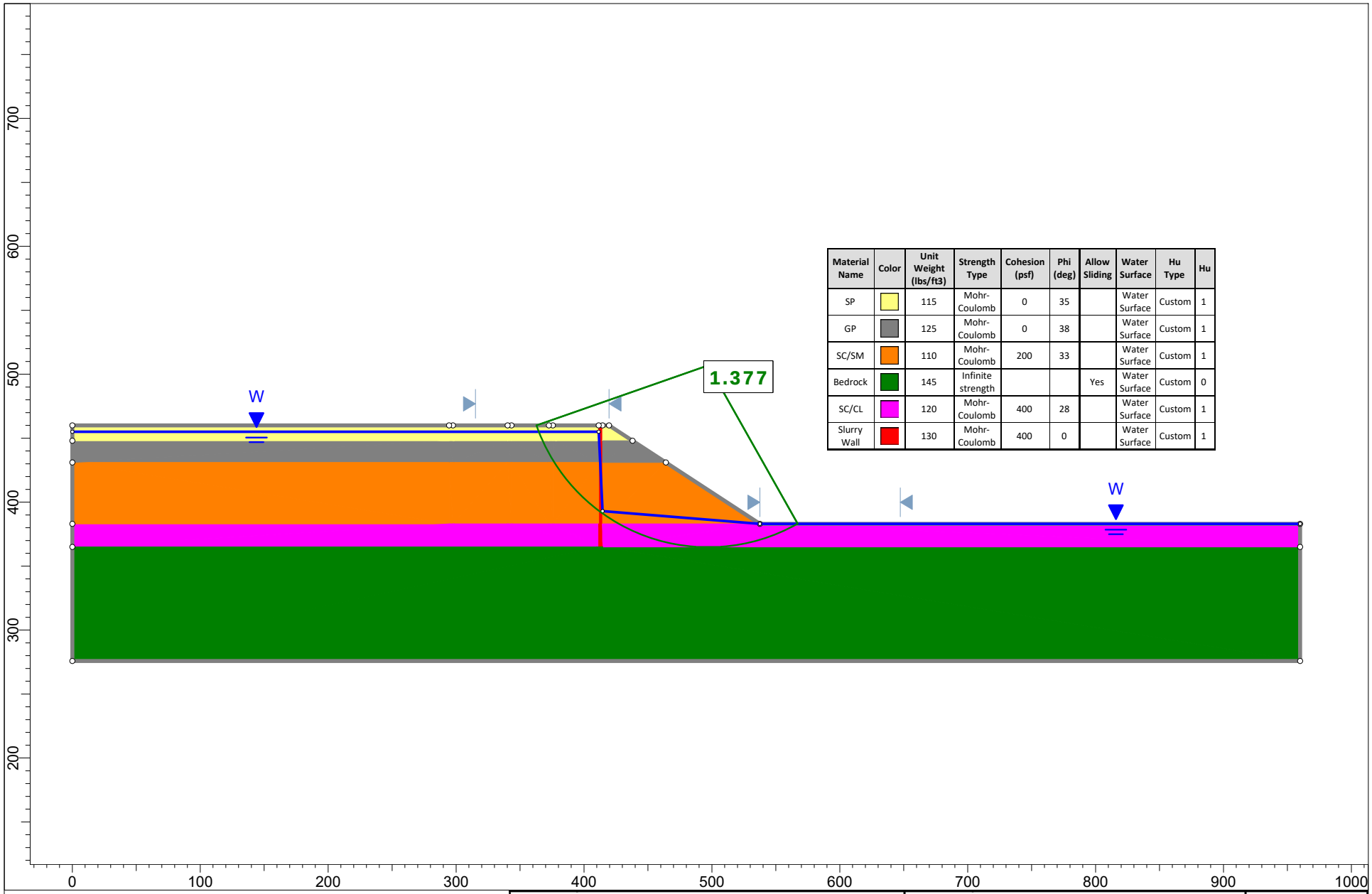
TITLE: TEMPORARY 1.5:1 SLOPE
FULLY DEWATERED
MODERATE STRENGTH SLURRY WALL

Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-16

REV: A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		110	Mohr-Coulomb	200	33		Water Surface	Custom	1
Bedrock		145	Infinite strength			Yes	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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CLIENT **SESPE CONSULTING, INC.**

Date Issued DECEMBER 2021

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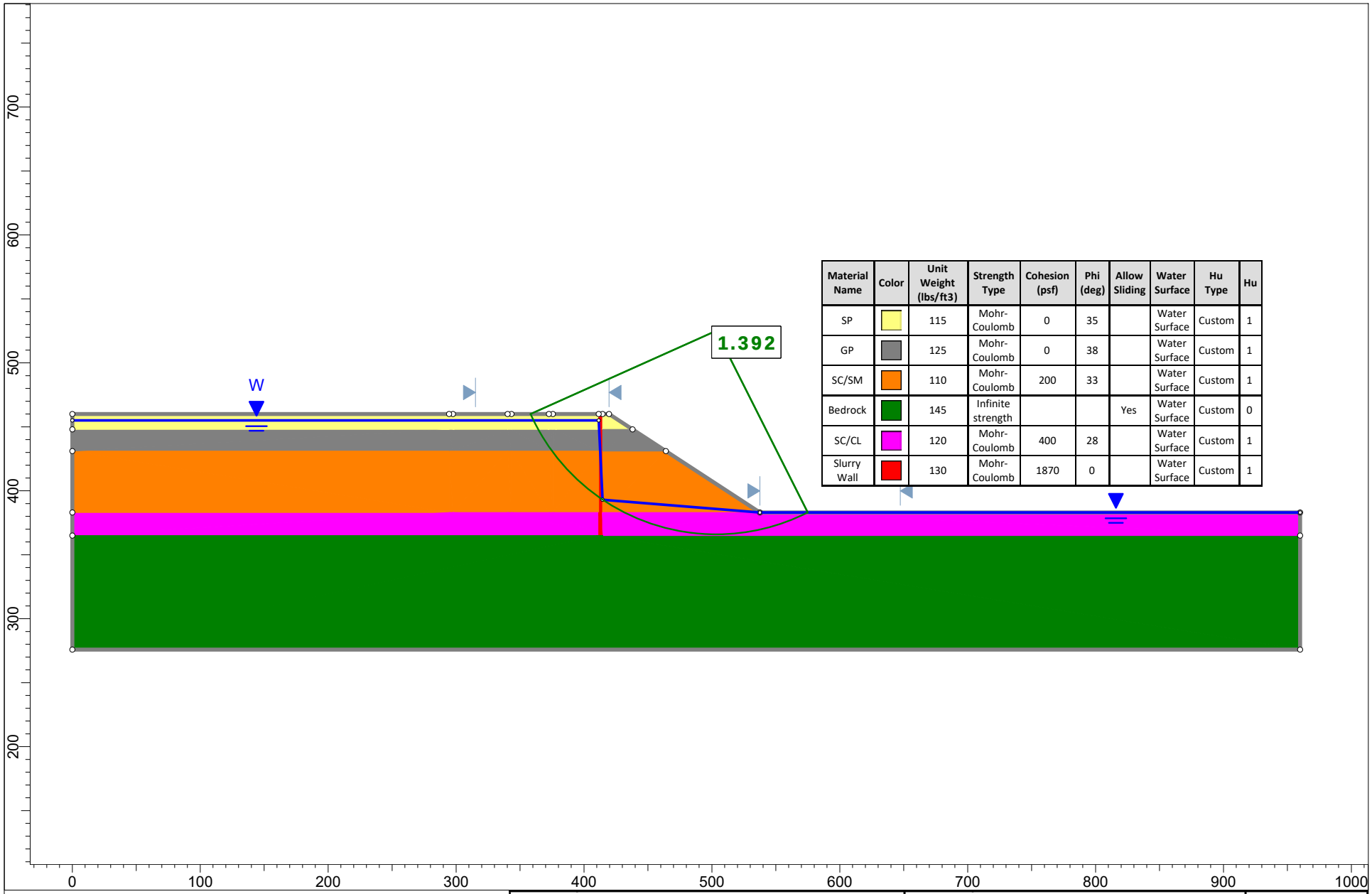
PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1.5:1 SLOPE PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-17**

REV **A**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		110	Mohr-Coulomb	200	33		Water Surface	Custom	1
Bedrock		145	Infinite strength			Yes	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

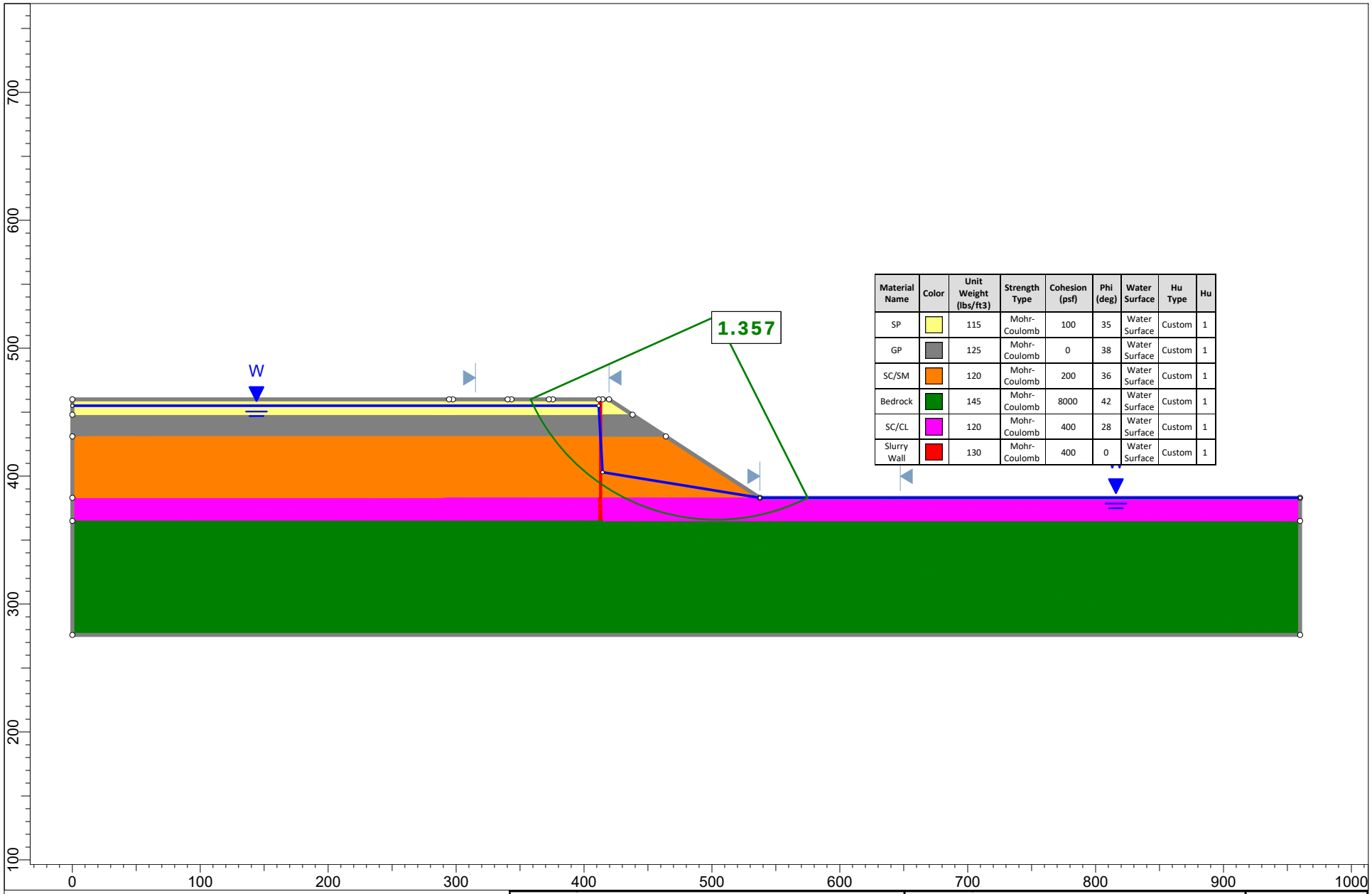
TITLE: TEMPORARY 1.5:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-18

REV: A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1

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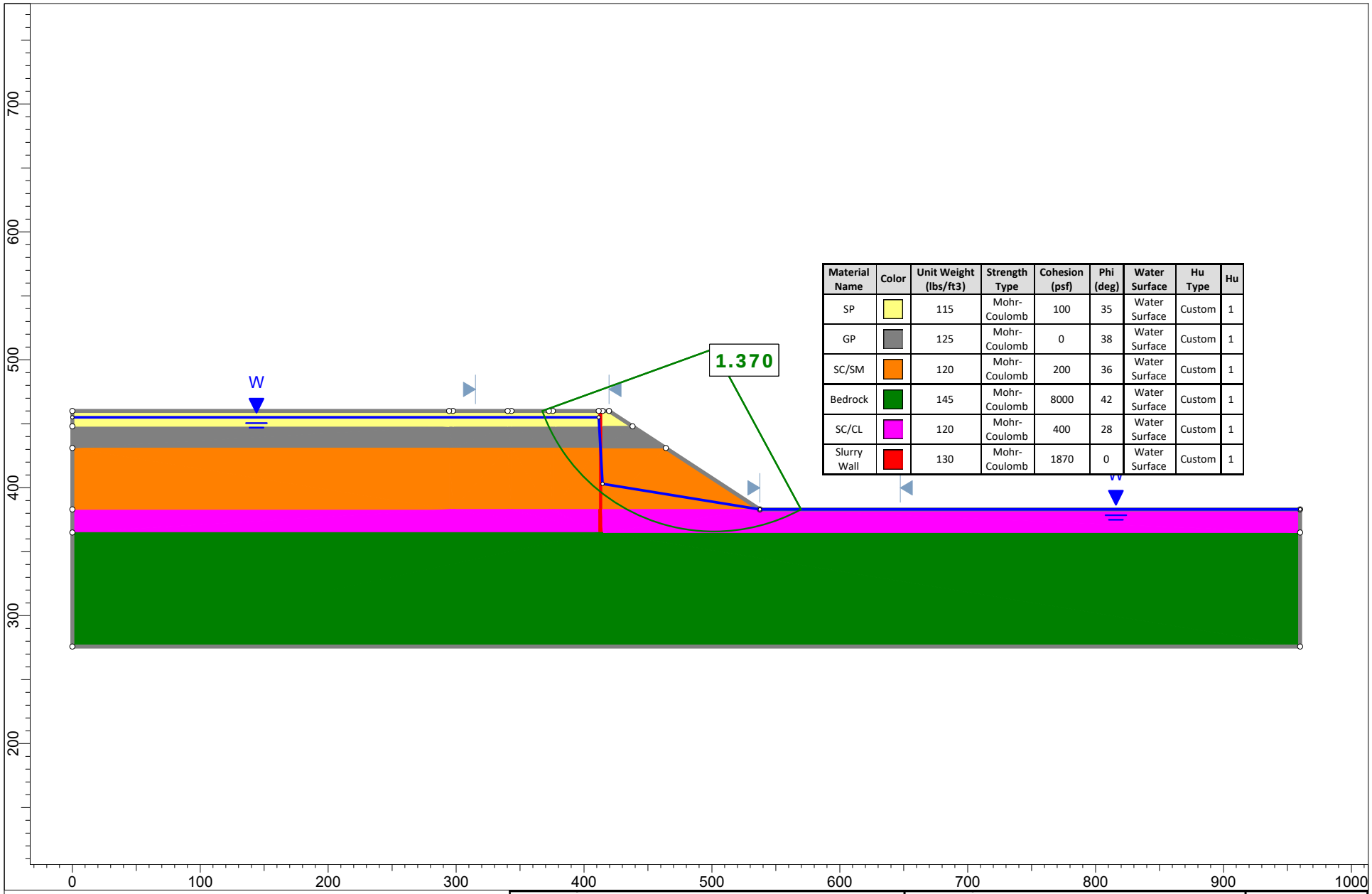
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.5:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

DRAWING No. C-19

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1

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PROJECT MCKAY POINT RESERVOIR PROJECT

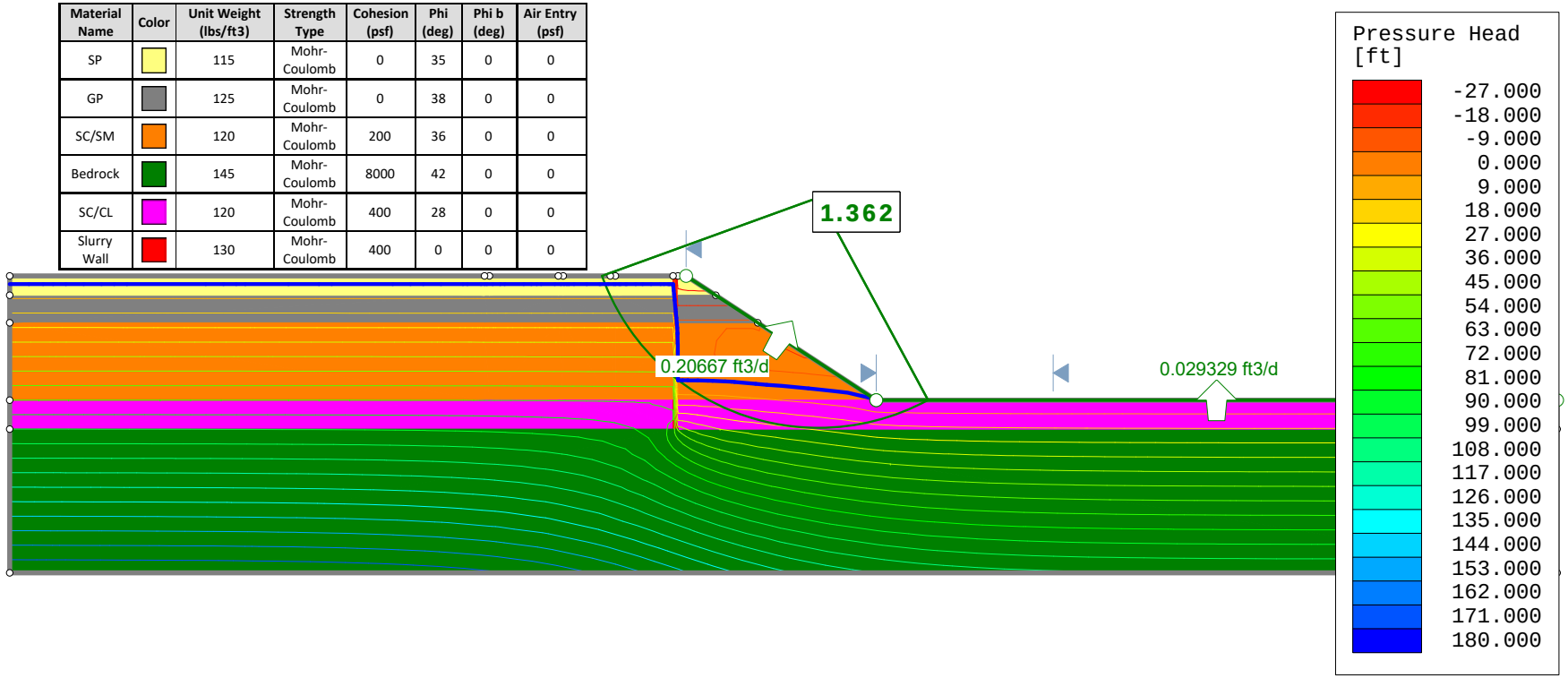
PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.5:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-20

REV A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0



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CLIENT: **SESPE CONSULTING, INC.**

PROJECT: **MCKAY POINT RESERVOIR PROJECT**

TITLE: **TEMPORARY 1.5:1 SLOPE**
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

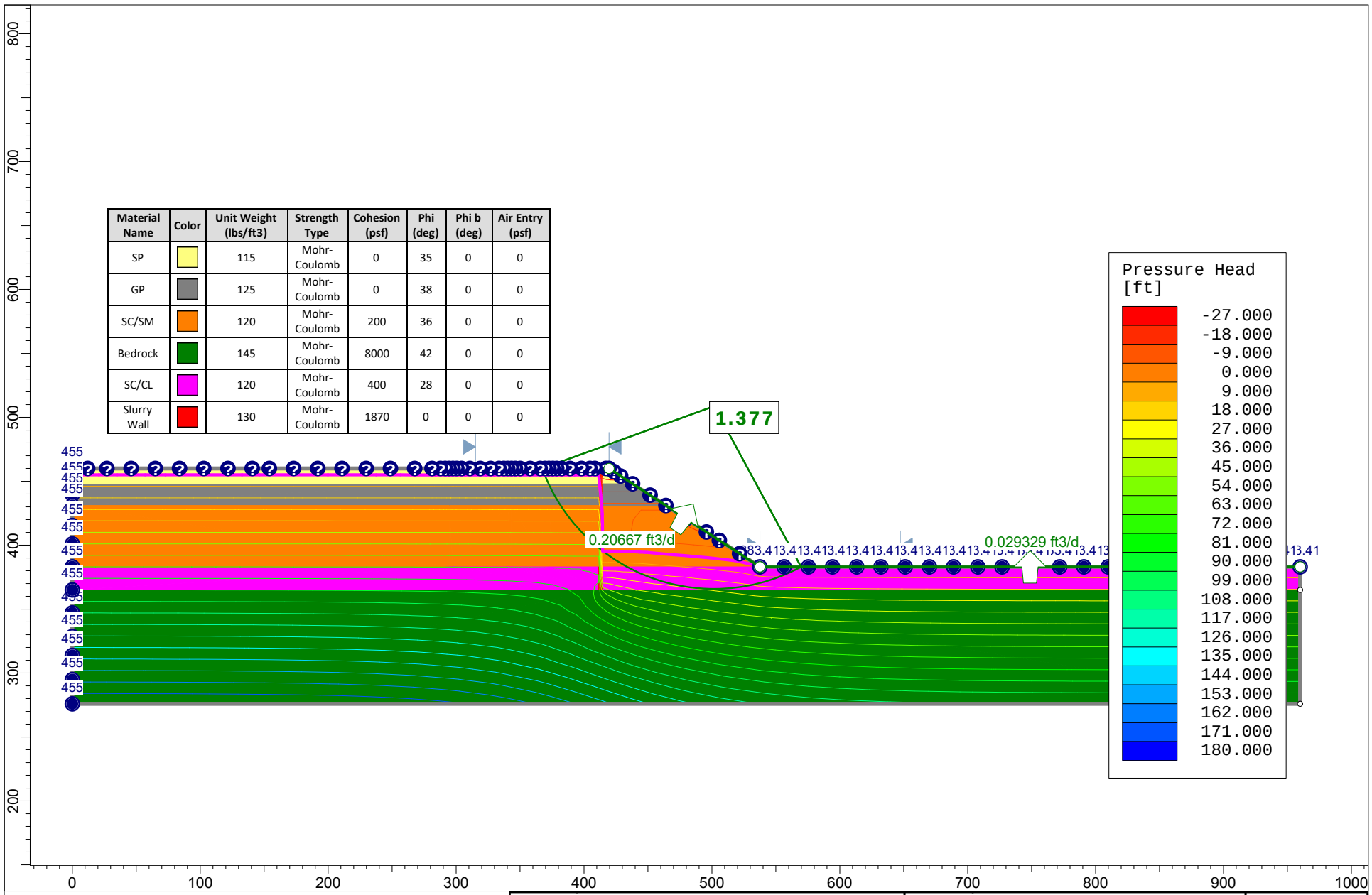
Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: **C-21**

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: TEMPORARY 1.5:1 SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

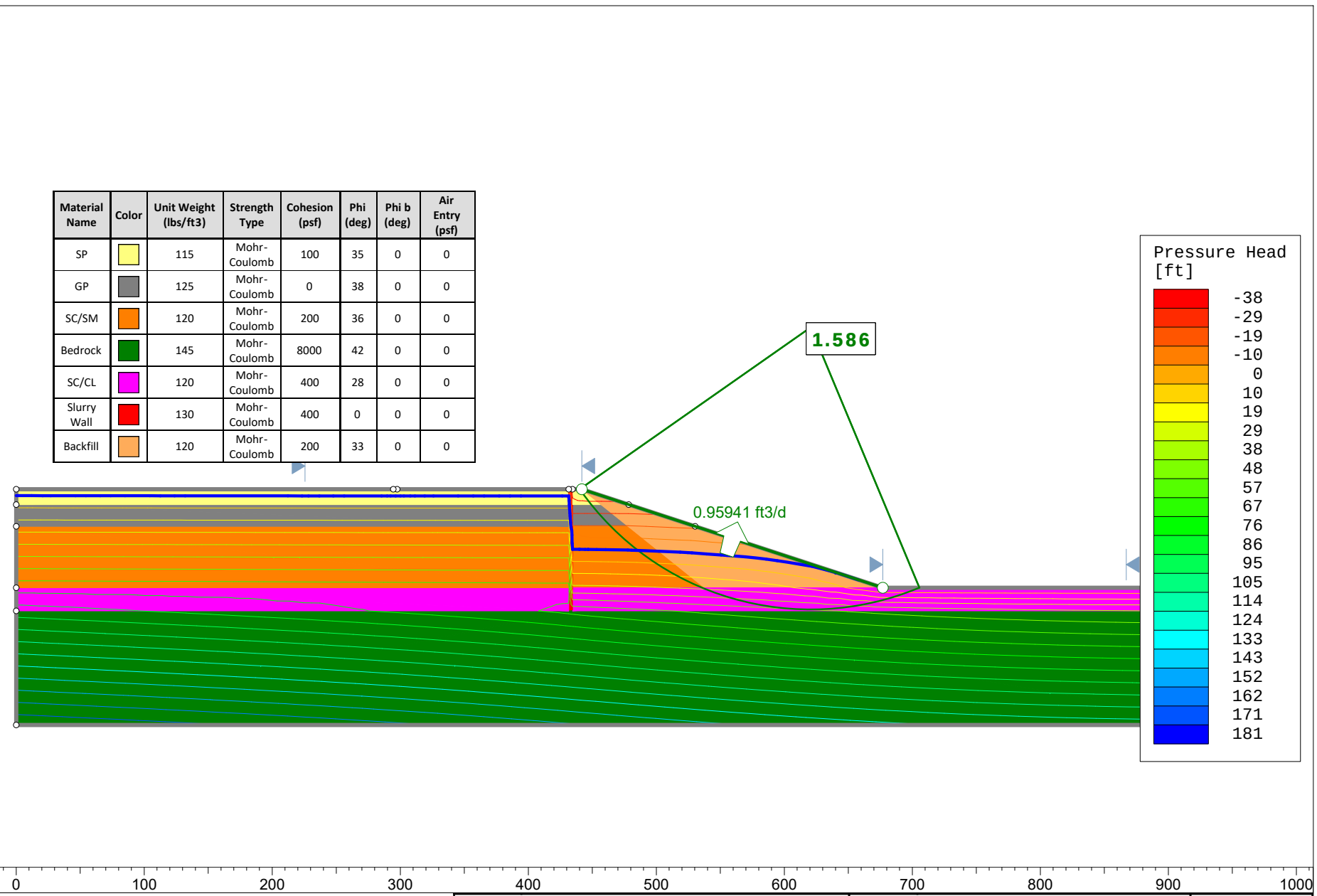
DRAWING No.: C-22

REV: A

PERMANENT

3H:1V

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.25:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

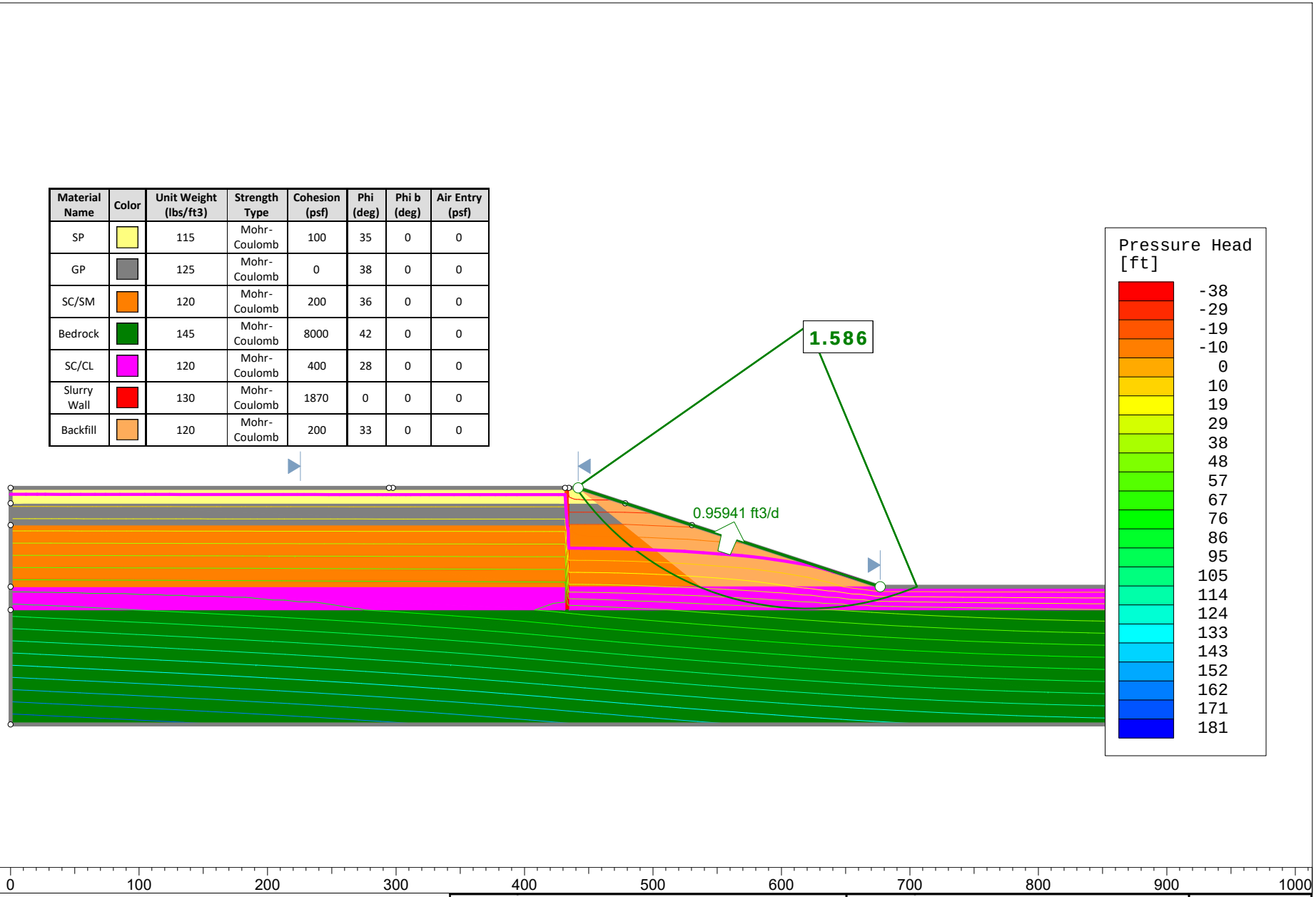
Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-23

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.25:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

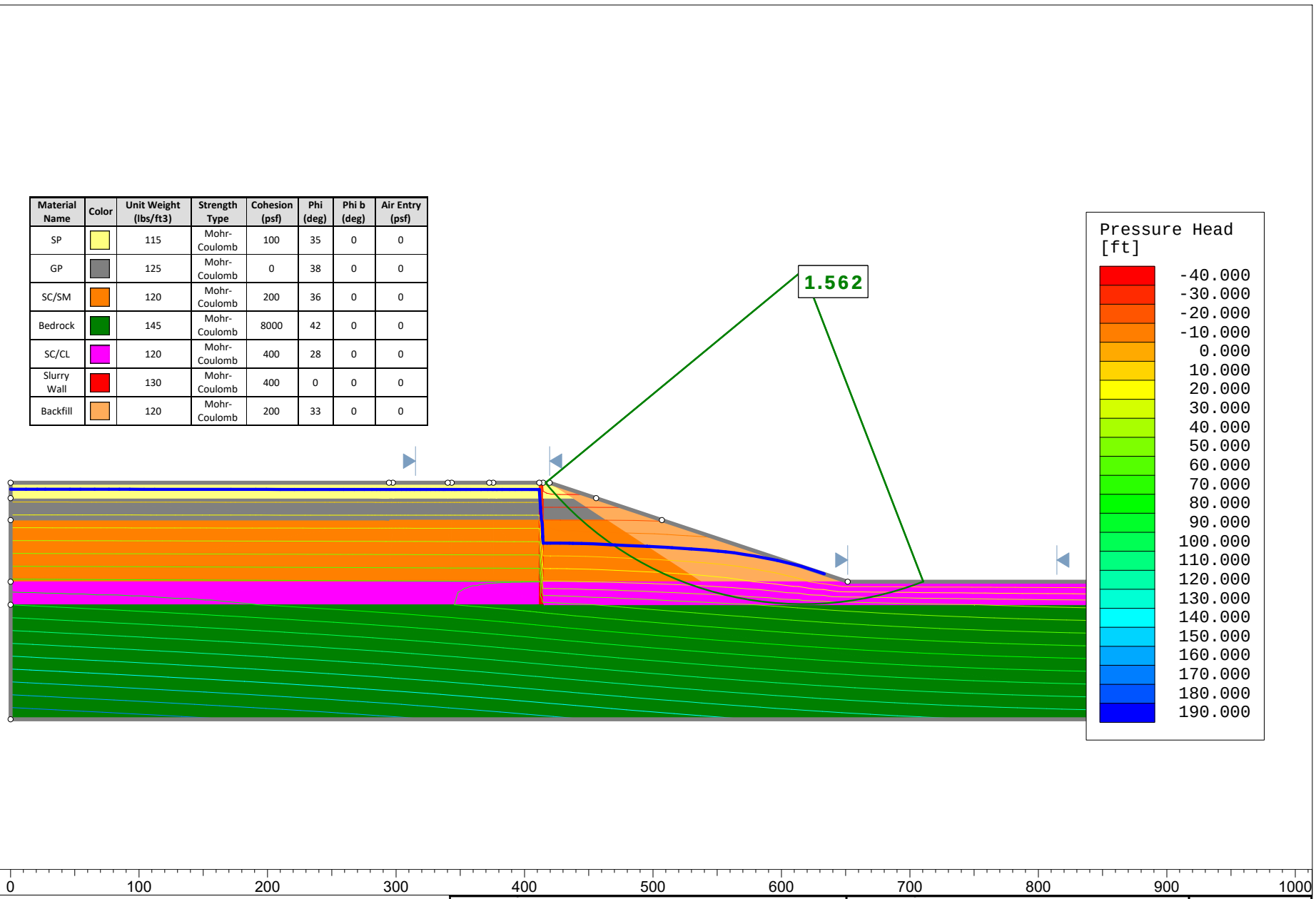
Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-24

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

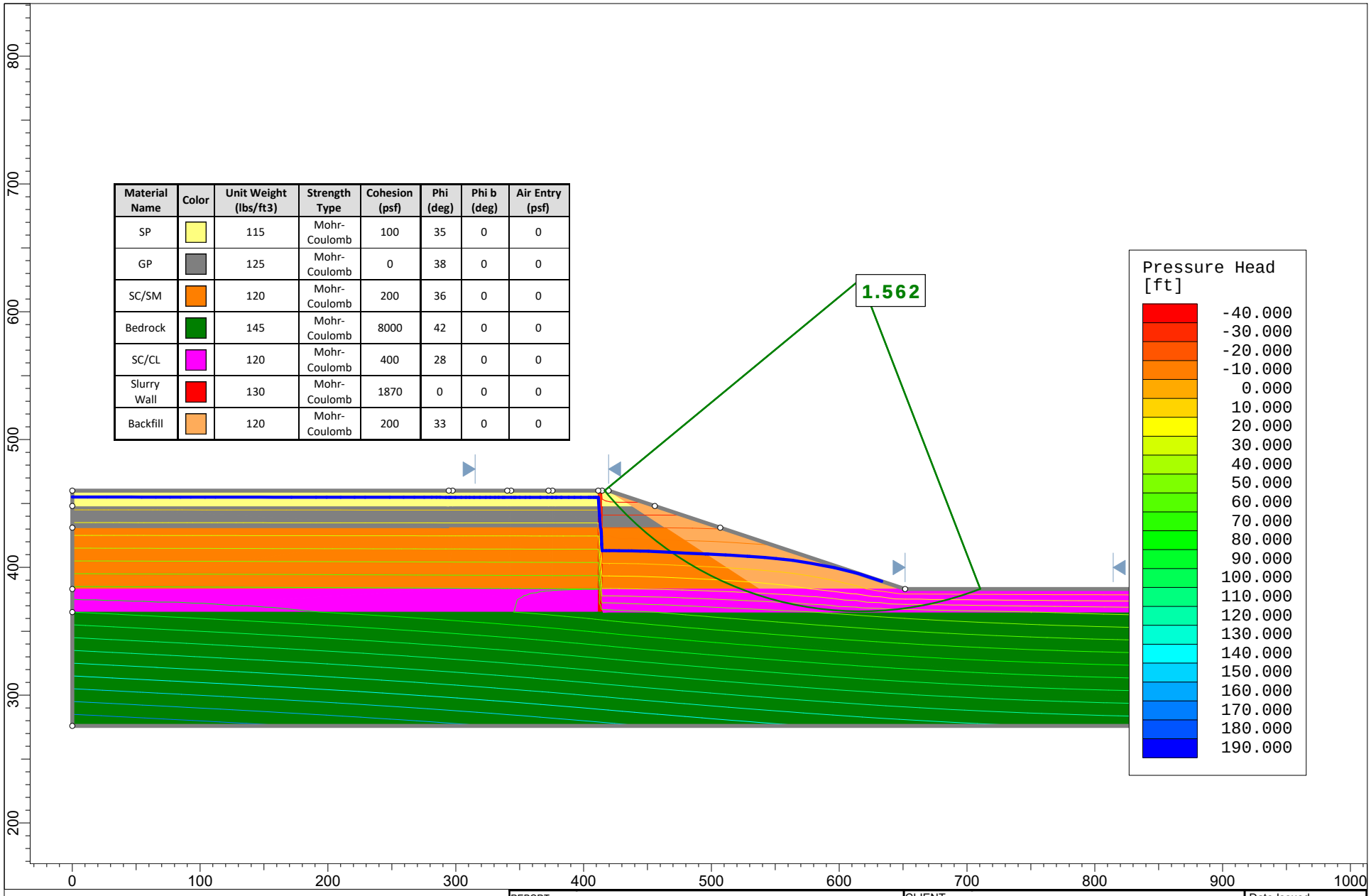
TITLE

PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

DRAWING No. C-25

REV A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

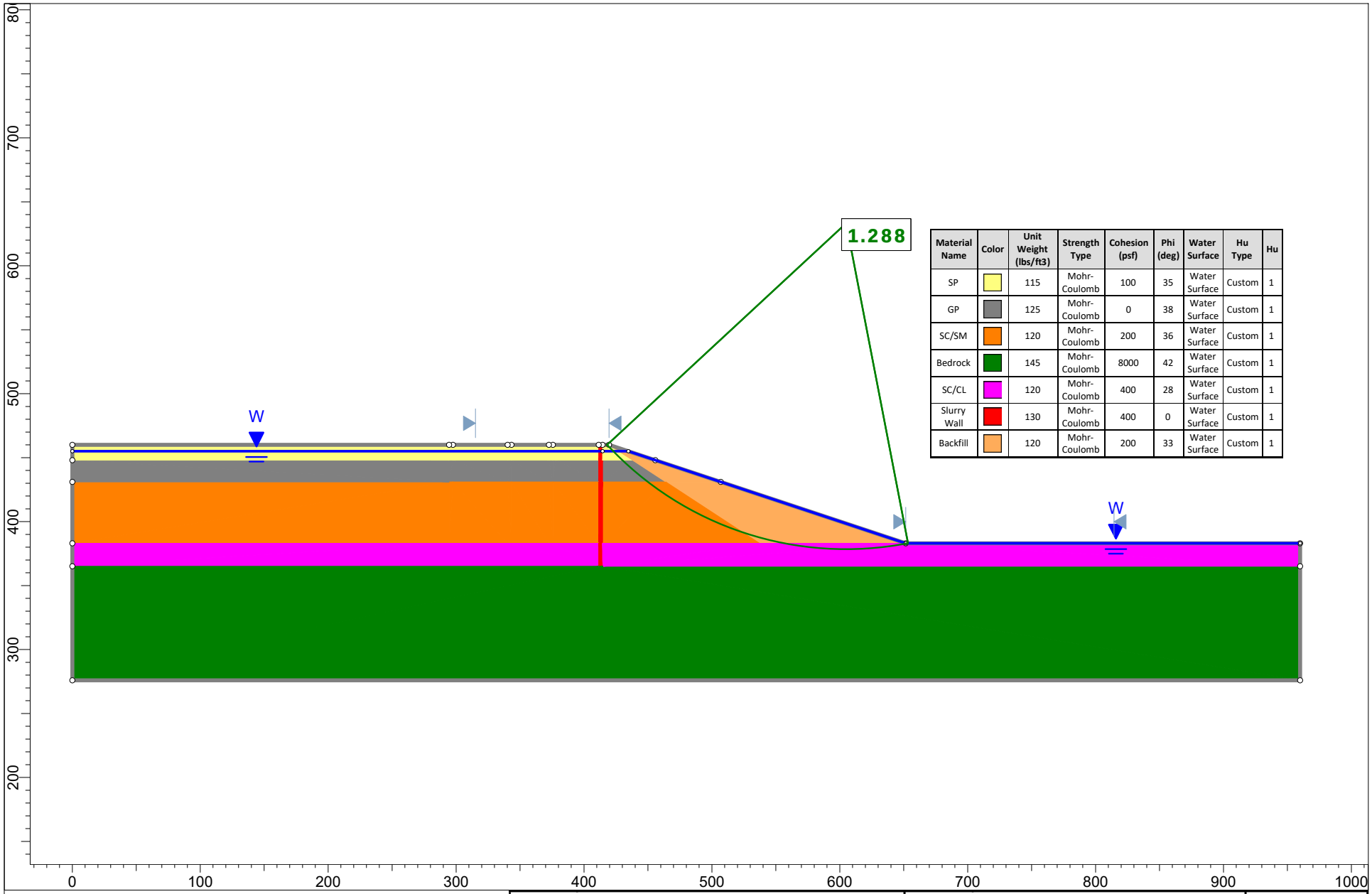
TITLE PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-26

REV A

3H:1V

RAPID DRAWDOWN



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1
Backfill		120	Mohr-Coulomb	200	33	Water Surface	Custom	1

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PROJECT: **MCKAY POINT RESERVOIR PROJECT**

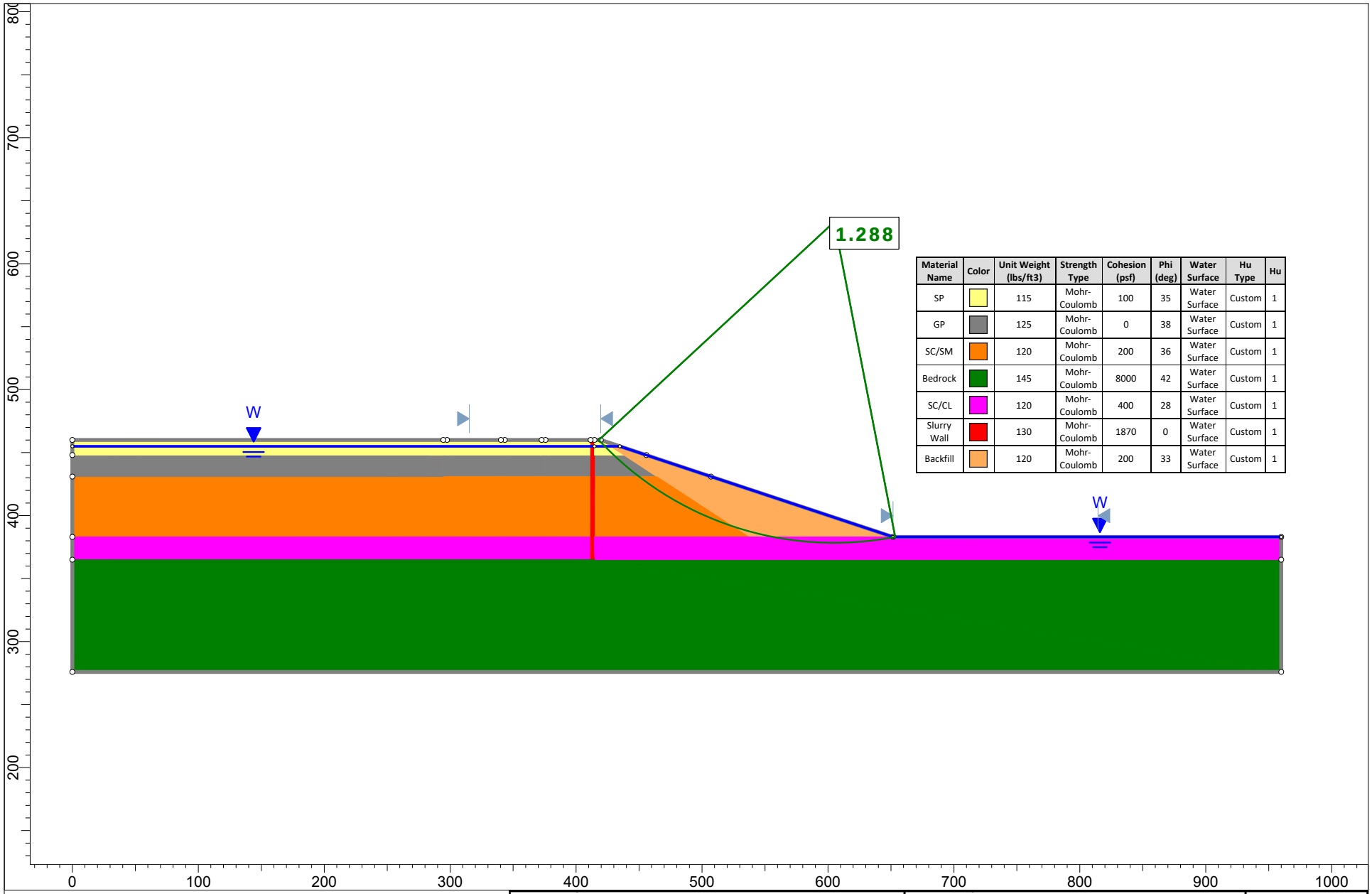
TITLE: **PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
RAPID DRAWDOWN
LOW STRENGTH SLURRY WALL**

Date Issued: DECEMBER 2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: **C-27**

REV: A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1
Backfill		120	Mohr-Coulomb	200	33	Water Surface	Custom	1

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PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

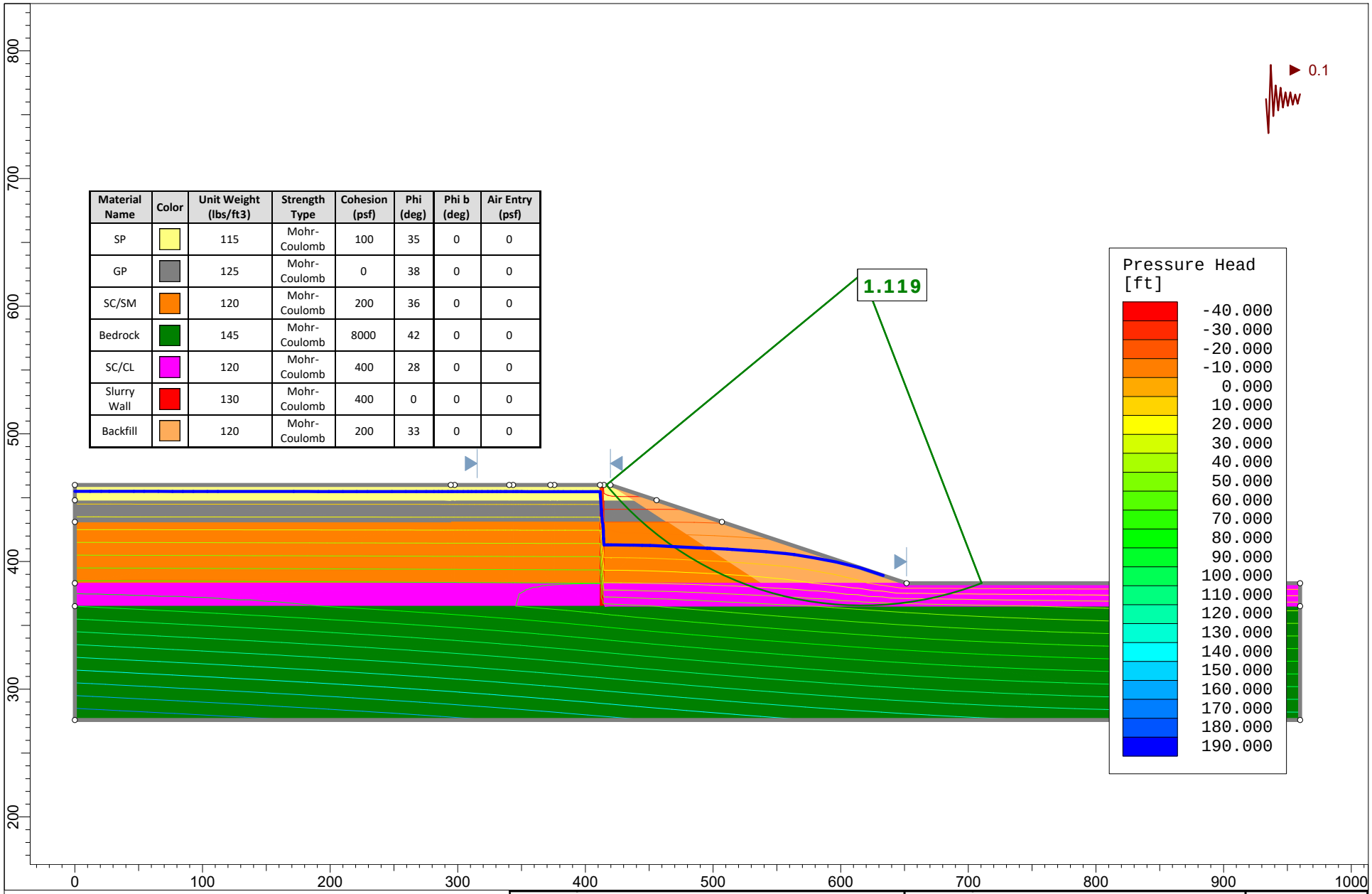
TITLE **PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE RAPID DRAWDOWN MODERATE STRENGTH SLURRY WALL**

DRAWING No. **C-28**

REV A

3H:1V

PSEUDOSTATIC



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0

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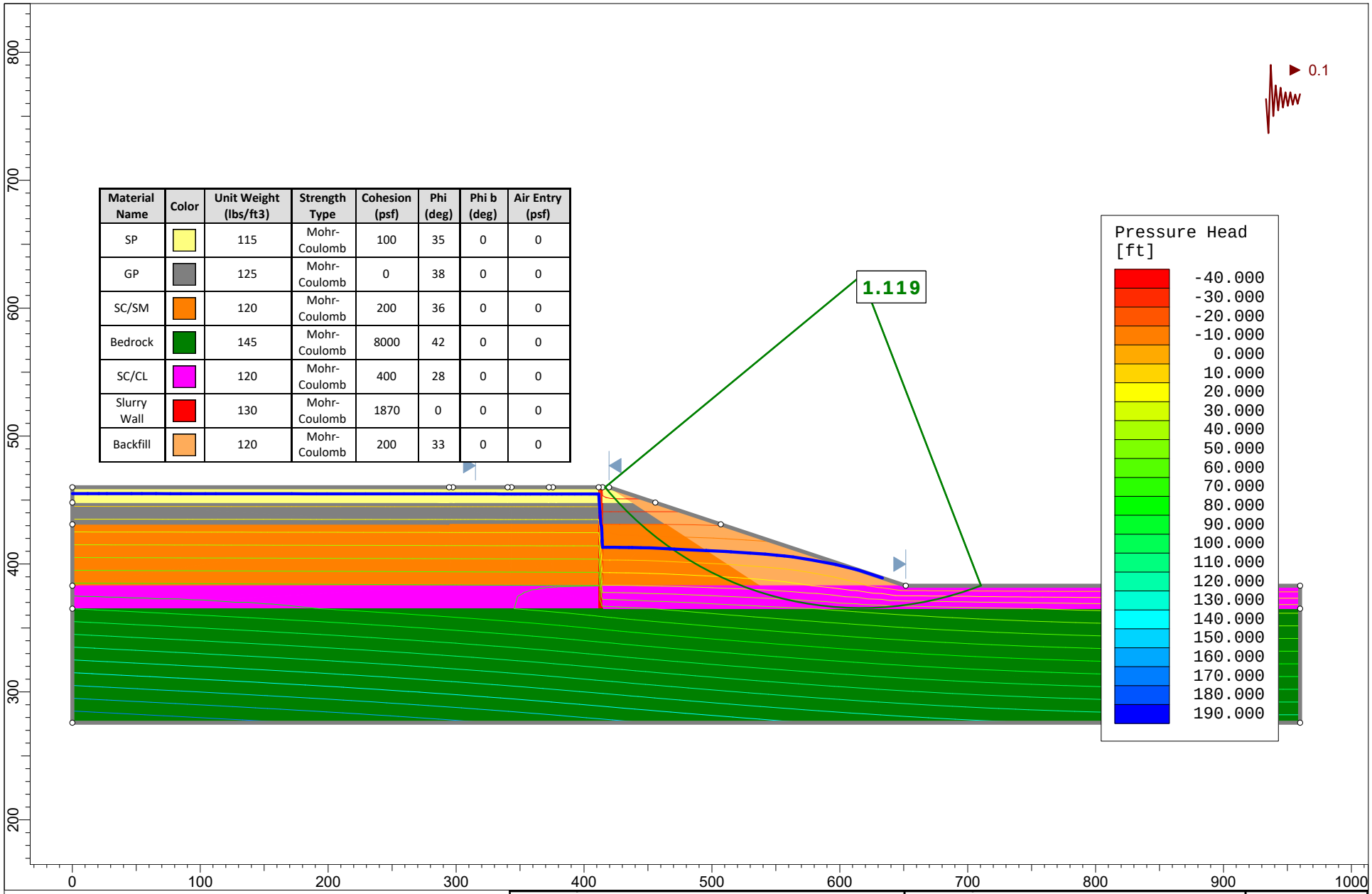
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE STEADY STATE PSUDO-STATIC SEISMIC LOADING LOW STRENGTH SLURRY WALL

DRAWING No. C-29

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0

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CLIENT **SESPE CONSULTING, INC.**

Date Issued DECEMBER 2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE STEADY STATE PSUDO-STATIC SEISMIC LOADING MODERATE STRENGTH SLURRY WALL**

DRAWING No. **C-30**

REV **A**

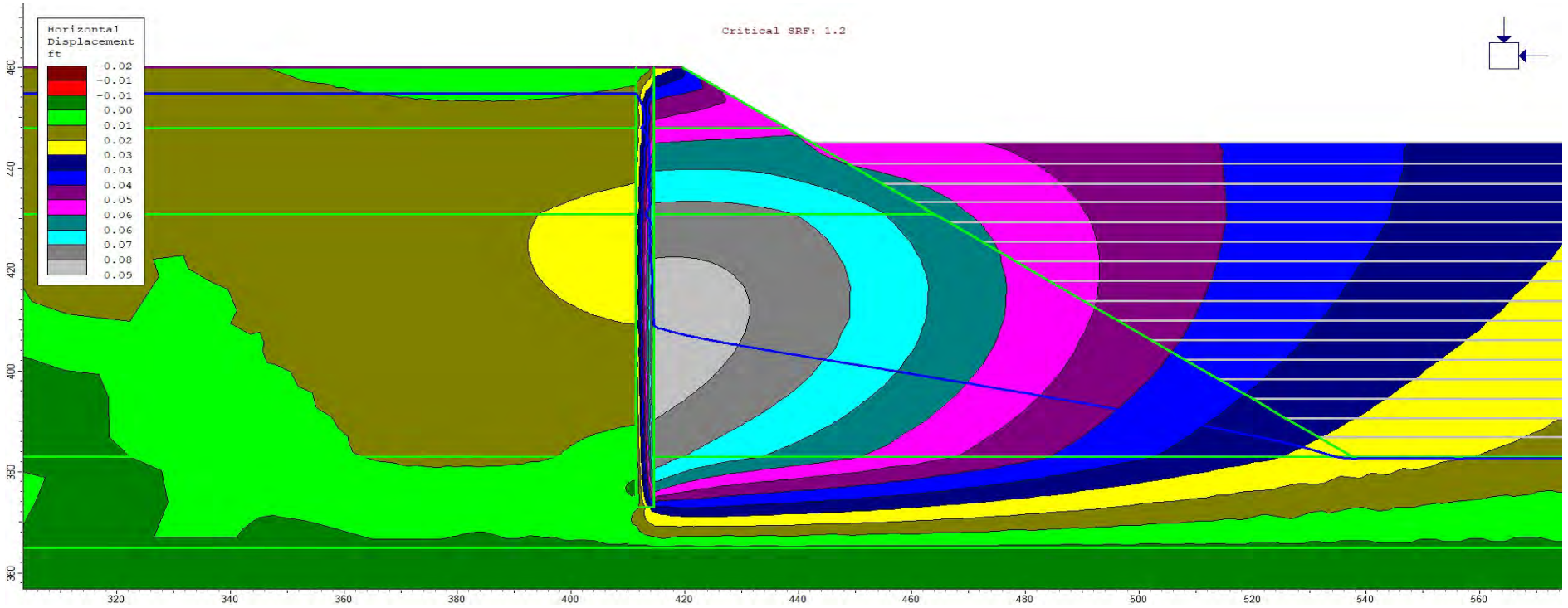
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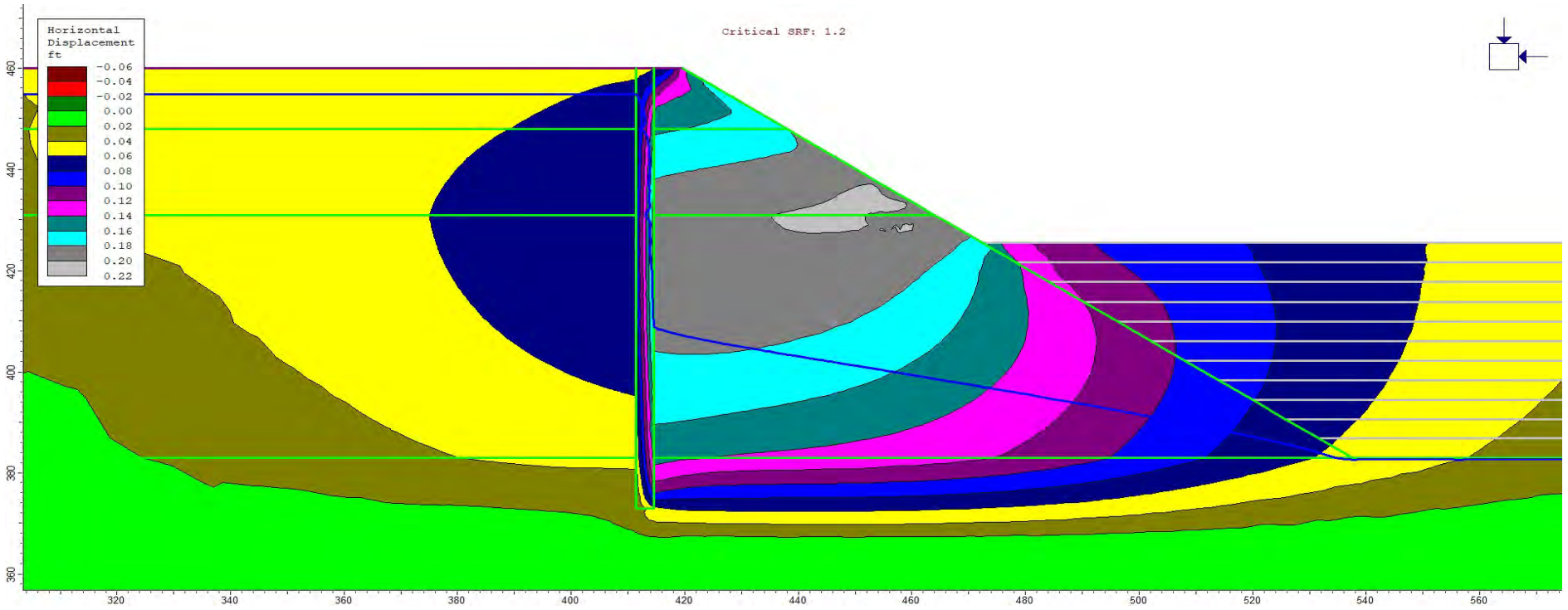
SLOPE AND SLURRY WALL STABILITY

(FINITE ELEMENT ANALYSIS)



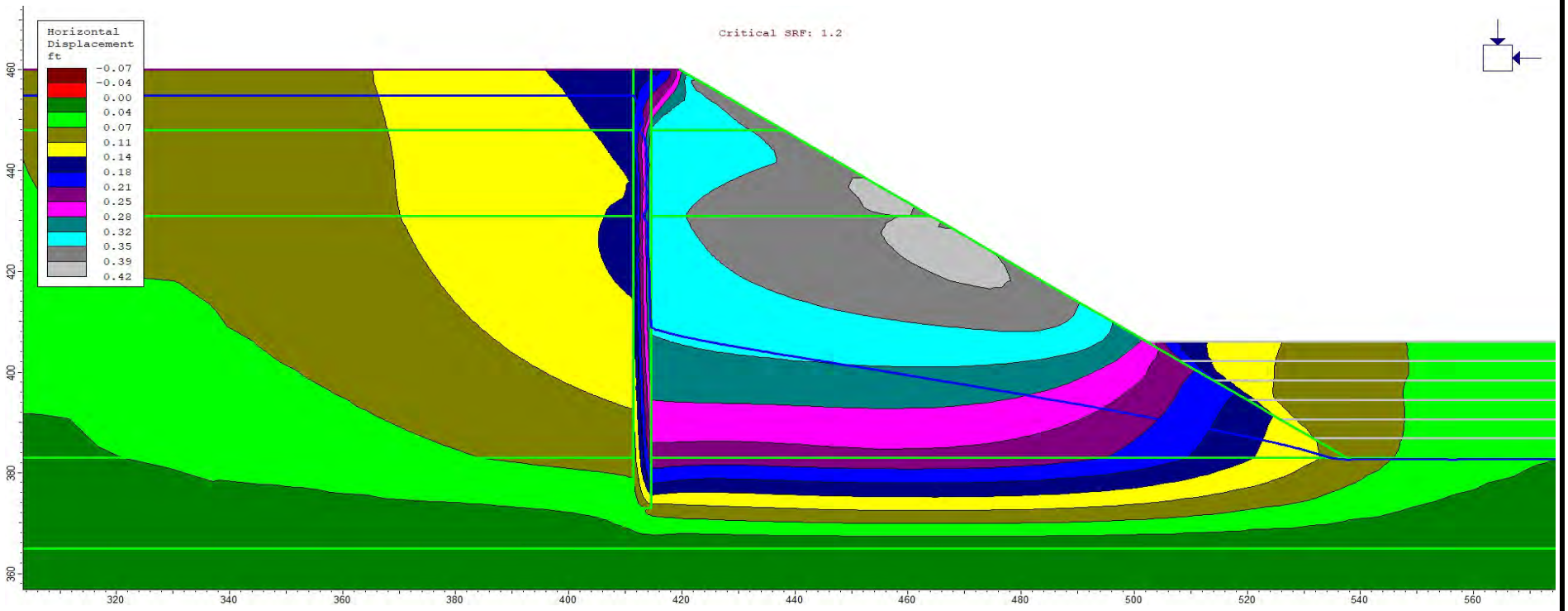
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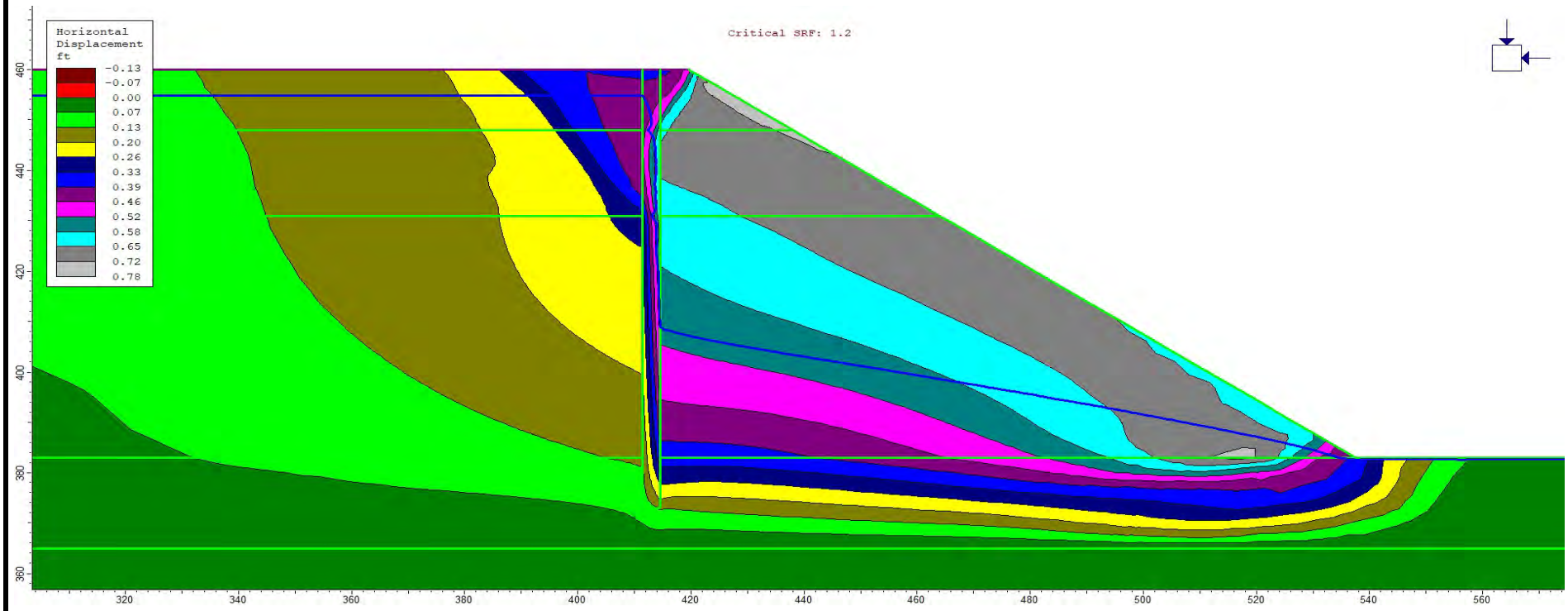
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	TITLE **1.5H:1V SLOPE 33' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-2**

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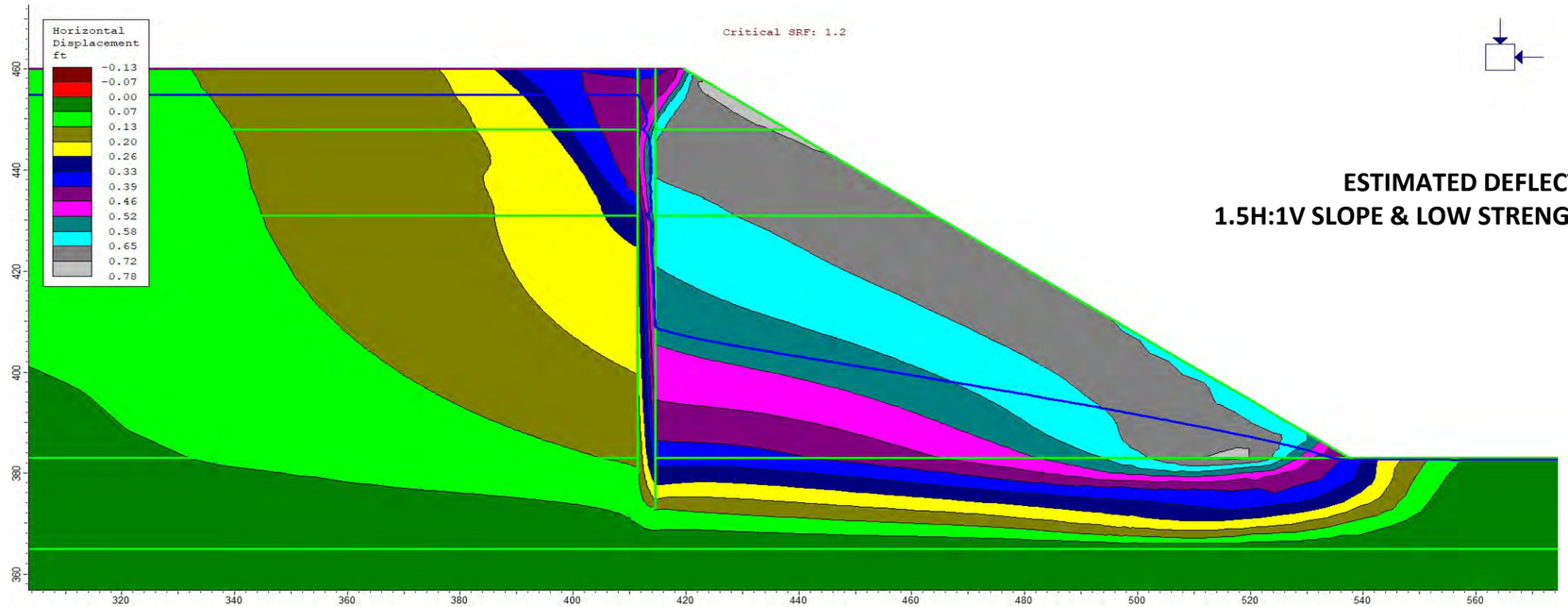
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	TITLE **1.5H:1V SLOPE 53' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-3**

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	TITLE **1.5H:1V SLOPE 76' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-4**	

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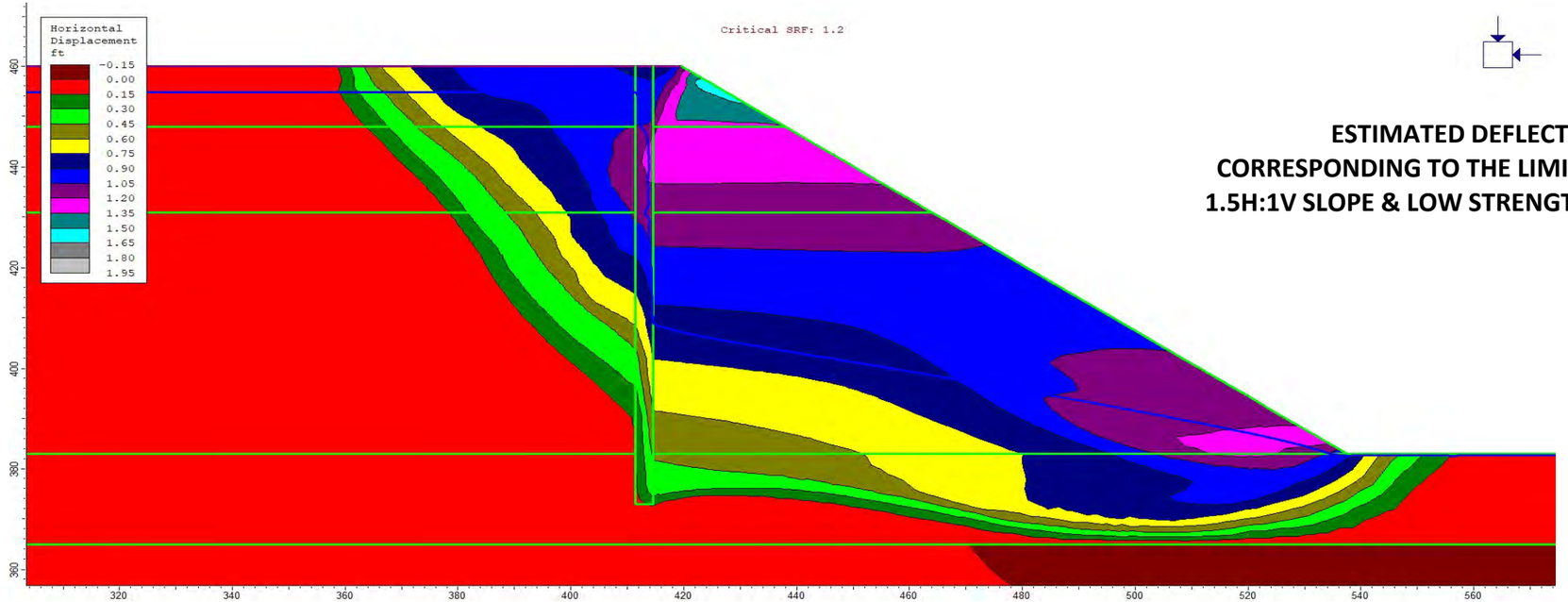


ESTIMATED DEFLECTIONS
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL

NOTES:

1. Deflection levels (ft) are color coded separately in each plot as shown in the insets.

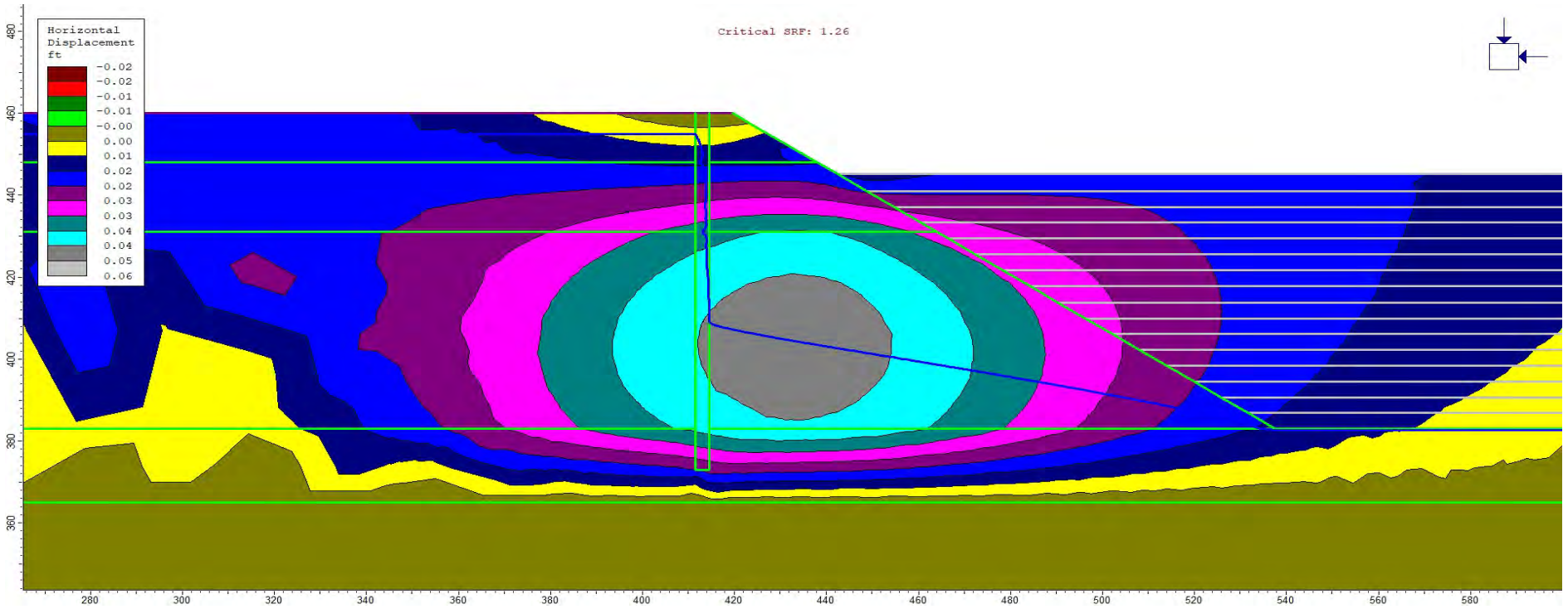
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ESTIMATED DEFLECTIONS
CORRESPONDING TO THE LIMIT OF STABILITY
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL

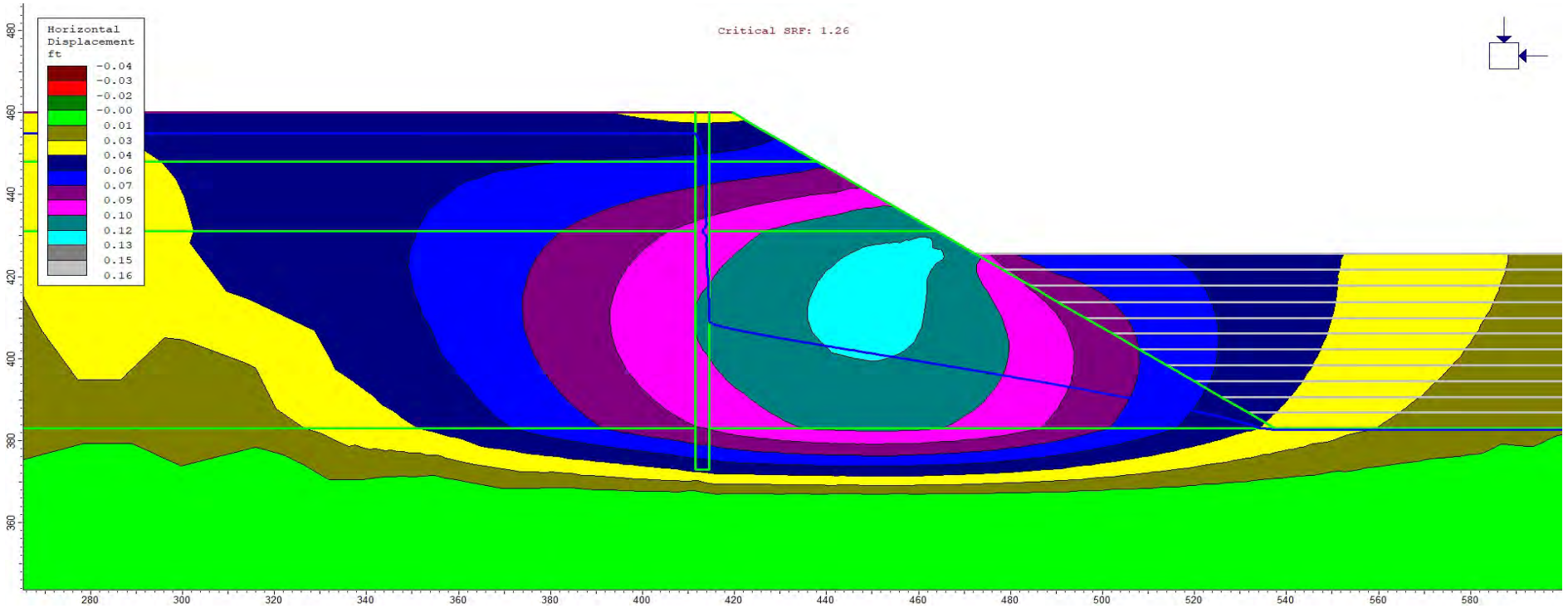
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	TITLE: **1.5H:1V DEFLECTION MARGIN LOW STRENGTH SLURRY WALL**	DRAWING No.: **D-5**

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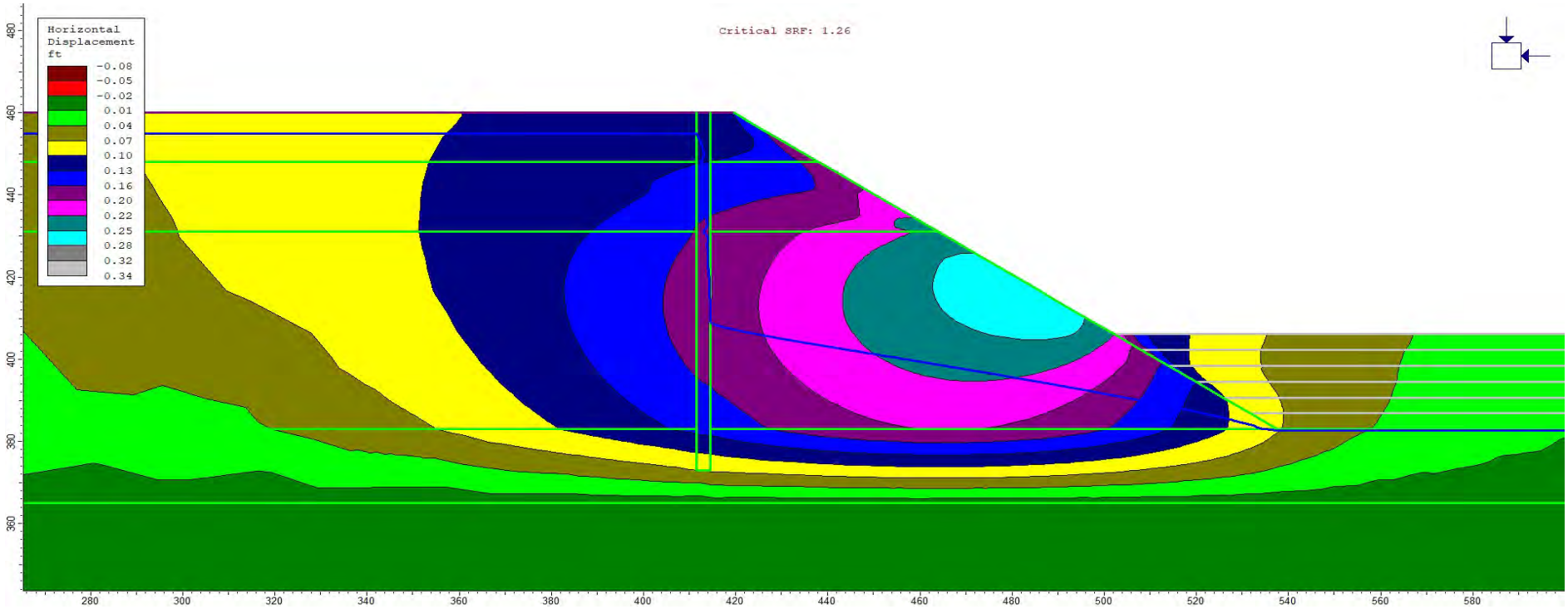
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	TITLE **1.5H:1V SLOPE 15' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-6**	

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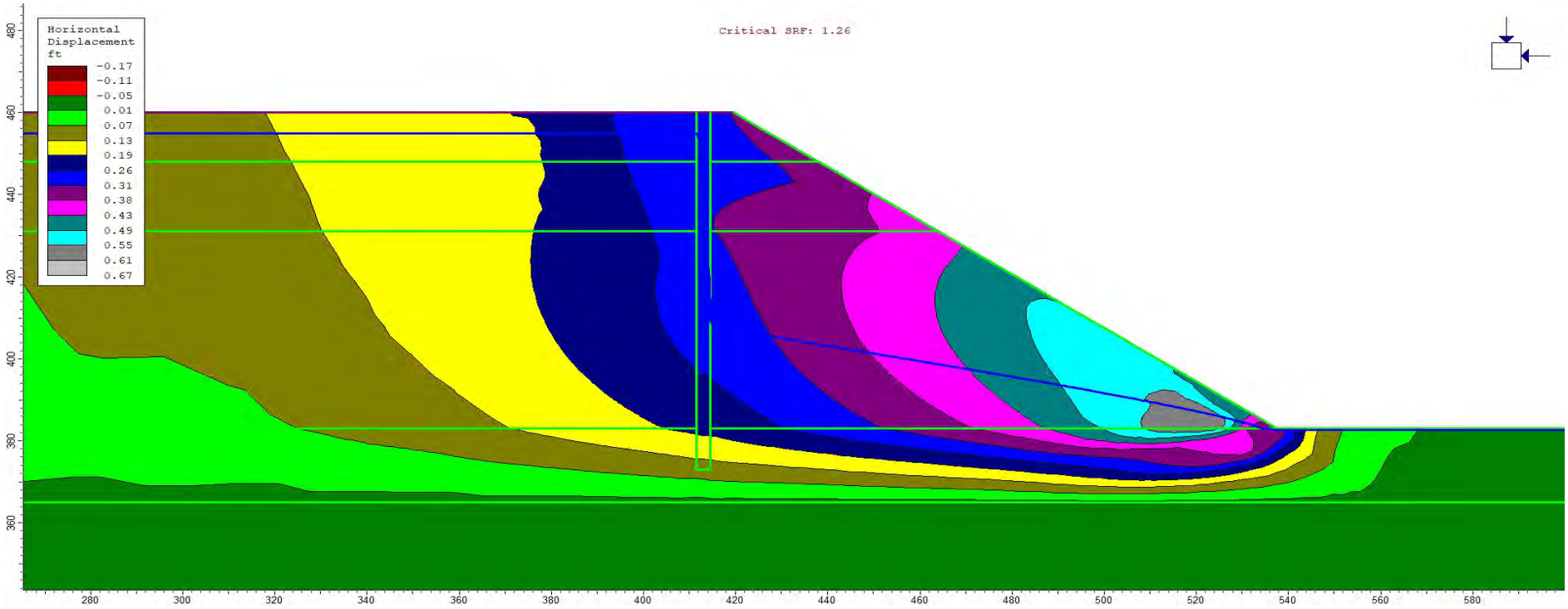
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	TITLE **1.5H:1V SLOPE 33' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-7**	

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	TITLE: **1.5H:1V SLOPE 53' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No.: **D-8**	

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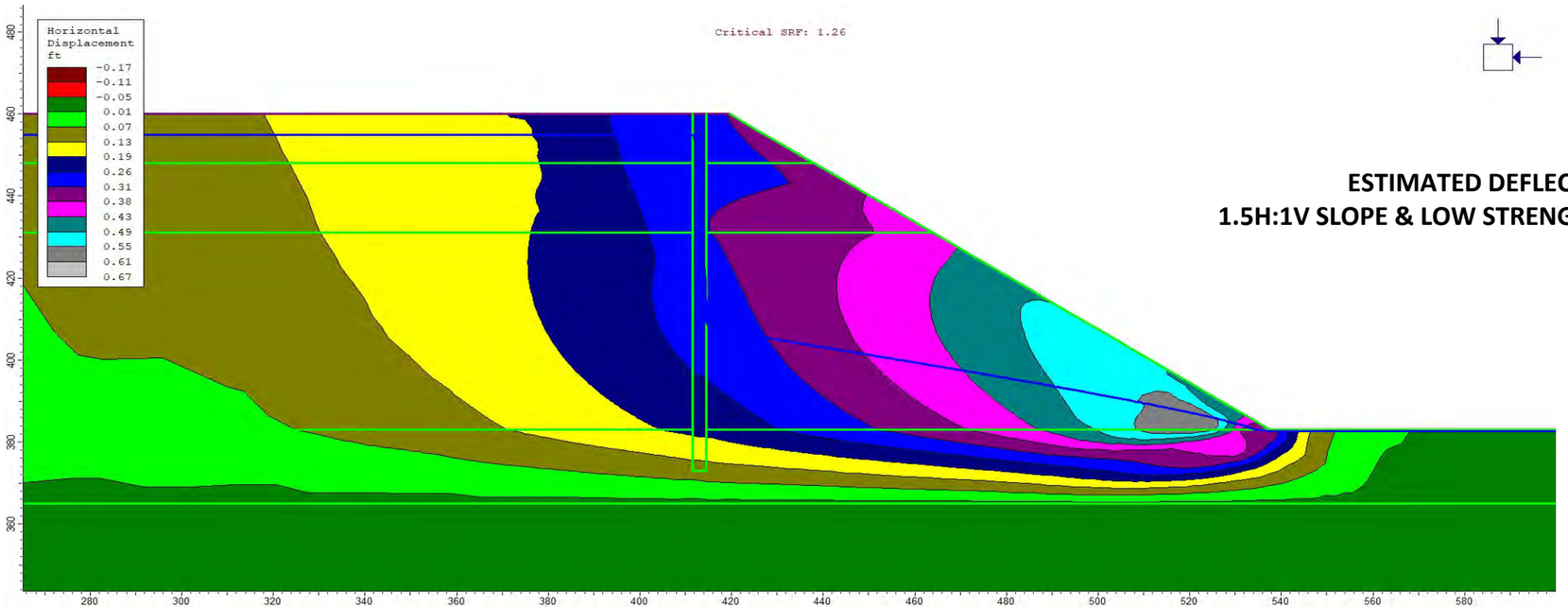
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	TITLE **1.5H:1V SLOPE 76' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-9**

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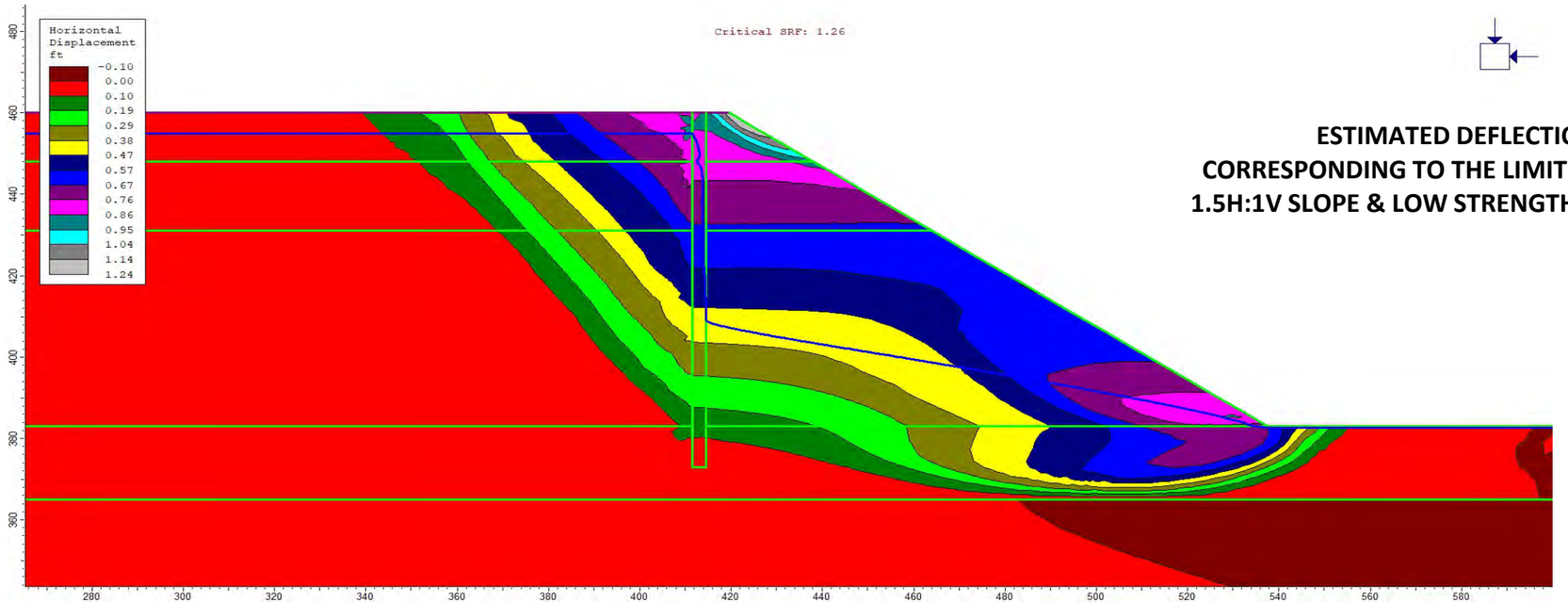
NOTES:

1. Deflection levels (ft) are color coded separately in each plot as shown in the insets.

2. The difference between the deflections under normal conditions (upper plot) and the simulated failure conditions (lower plot) is indicative of the safety margin.



ESTIMATED DEFLECTIONS
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL



ESTIMATED DEFLECTIONS
CORRESPONDING TO THE LIMIT OF STABILITY
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL

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	TITLE: **1.5H:1V DEFLECTION MARGIN MID-STRENGTH SLURRY WALL**	DRAWING No.: **D-10**

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APPENDIX C

Hydrology and Water Quality Technical Study – McKay Point Reservoir Project
(SLR International Corp. – January 2022)

global environmental solutions

MCKAY POINT RESERVOIR PROJECT

Hydrology and Water Quality Technical Study

SLR Ref: 117.01263.00001

January 25, 2022

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Hydrology and Water Quality Technical Study

Prepared for:

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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.



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Senior Associate



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Principal

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1. INTRODUCTION

1.1. BACKGROUND

This document addresses potential CEQA relevant impacts on hydrology and water quality associated with the Project. Impacts on potential flooding, surface water drainage, groundwater flow, groundwater supply, and water quality are considered.

The hydrology and water quality conditions of the Project were assessed through review of Applicant-submitted documents, existing publicly available data and reports, and field observations. The Applicant has prepared documentation regarding groundwater conditions as presented in *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project* (Schmidt, 2012) and *McKay Point Project*. Data from other publicly available documents were reviewed and evaluated as part of this assessment.

This document includes a discussion of the general Site conditions including environmental setting, climate, surface-water conditions, and groundwater conditions. The design and the construction stages of the Reservoir are described. Anticipated changes to the baseline conditions due to the Project are also evaluated. Finally, potential impacts to hydrology and water quality are evaluated based on the California Environmental Quality Act (CEQA) Appendix G significance criteria.

1.2. PROJECT OVERVIEW

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Kaweah and St. Johns Rivers in Tulare County, California, commonly referred to as the McKay Point Project area or Site (Figures 1 and 2). Together, the Owners are the holders of pre-1914 and appropriative water rights on the Kaweah and/or the St. Johns Rivers, and they own storage capacity rights in Lake Kaweah formed by the impoundment of water behind the Terminus Dam.

The Owners are also members of the Kaweah and St. Johns Rivers Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. The Owners propose to develop approximately 200 acres of the total 500-acre McKay Point property on the north side of the divergence of the Kaweah and St. Johns Rivers into a surface water storage and reregulation reservoir (Reservoir) as shown on Figures 2 and 3. When completed, the Reservoir will serve as a surface water storage/re-regulation facility. The Owners will also use the Reservoir to optimize groundwater recharge in basins within the Kaweah subbasin.

West Coast Aggregate (WCA) will excavate the Reservoir in accordance with plans and specifications to be developed. WCA intends to process the resulting aggregate materials (i.e., rock, sand, and gravel) within the Project Site (Figures 2 and 3). WCA would then sell processed materials such as Portland Cement Concrete (PCC) grade aggregate, used by their customers

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offsite to manufacture concrete and asphaltic concrete products. WCA will also recycle concrete construction debris at their facility.

The Reservoir capacity is expected to be 4,600-acre feet. Its depth is expected to range from approximately 60 to 80 feet locally, with a typical average depth of approximately of 75 feet. The material excavated during construction will consist of resource-grade aggregate and will be processed at the WCA facility to be established within the excavation area.

Upon completion of the Reservoir excavation, water will be periodically diverted from the Kaweah River and stored in the Reservoir to achieve the following objectives:

- Store winter runoff and release in summer when required downstream.
- Reduce flood peaks during periods of high flows.
- Store Kaweah River water when the Owners' systems are at capacity so that additional water can be released later to be used for groundwater recharge within the Owners' respective service areas.

The Reservoir will extend vertically below the groundwater levels, and the Applicant will implement dry mining methods to recover the aggregate and to create the Reservoir. Dewatering of the excavated area will be conducted, as necessary to allow for dry mining techniques.

The Reservoir phase of the Project will entail storage and release of surface water only. To minimize groundwater from entering the excavation and the Reservoir, a slurry wall will be installed around the perimeter to decrease groundwater seepage. While some amount of seepage inflow will occur during periods when the Reservoir is not full, this seepage will be pumped out and returned to nearby groundwater. The slurry wall will also minimize stored water losses from the Reservoir to groundwater when it is full.

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2. ENVIRONMENTAL SETTING

2.1. REGIONAL SETTING

The Site is in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California (Figure 1). The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Central Valley is one of the most productive agricultural regions in the world.

The Site vicinity is drained by the Kaweah and St. Johns Rivers, which drain ultimately to the Tulare Lakebed in the southern end of the San Joaquin Valley (Figure 4). In 1962, Lake Kaweah, located upstream from the Site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced flooding at the Site and the surrounding area.

The Site is in the eastern portion of Kaweah Sub-basin of the San Joaquin Valley Groundwater Basin. This area is underlain by young and old unconsolidated fluvial deposits (sandy and silty gravels, clayey sand and cobbles, and silty and clayey sands) that originated from the nearby Sierra-Nevada Mountains. These moderately to highly permeable silts, sands and gravels extend to depths of several hundred feet or more.

2.2. LOCAL SETTING

The Site is currently undeveloped and has been used for cattle grazing under lease arrangements. Most of the Site is vegetated with native grasses.

The surface soil at the Site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the river split generally to the south and southwest toward the St. Johns River. The Site elevation slopes from approximately 472 feet above mean sea level (msl) at the northeastern end of the property, downward to approximately 454 feet above msl at the southwestern end.

2.3. CLIMATE

2.3.1. CURRENT CONDITIONS

Climate in the Site vicinity is typical of the foothill region of the central valley, with cool rainy winters having a mean daily temperature ranging from 40° to 50° F and hot dry summers when daytime temperatures can exceed 100° F (Table 1). During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the area. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and the ranges. Most of the precipitation occurs from November through April.

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TABLE 1: SITE VICINITY CLIMATE SUMMARY													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average Max. Temperature (^{O}F)	56.5	62.9	68.6	75.6	84.4	92.8	99.3	97.5	91.2	80.3	66.7	56.8	77.7
Average Min. Temperature (^{O}F)	37.0	40.6	43.6	47.2	52.4	58.2	63.2	61.7	57.4	50.5	42.1	36.9	49.2
Average Total Precipitation (inch)	2.73	2.44	2.48	1.50	0.57	0.14	0.01	0.03	0.20	0.70	1.46	2.10	14.38
Average Total Snowfall (inch water)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (inch)	0	0	0	0	0	0	0	0	0	0	0	0	0
Pan Evaporation (inch)	1.37	1.81	3.13	4.50	7.31	9.17	10.55	9.70	7.93	5.17	2.40	1.42	64.46
Evaporation data from Army Corp of Engineers (2014), Terminus Dam, California, period of record 2001-2007. All other climate data from WRCC (2014), Lemon Cove, California, period of record 1899-2013.													

2.3.2. CLIMATE CHANGE

Based on studies conducted for the Greater Kaweah Groundwater Sustainability Agency (GEI/GSI, 2020) the following changes to the precipitation, evapotranspiration, and runoff in the East Kaweah Basin are projected for 2030 and 2070 respectively. These projections are compared to current, or baseline conditions determined for the period 1981 to 2010.

Precipitation

Annual precipitation is projected to change very little, by approximately 0.5% either up or down. However, the seasonal distribution of precipitation will change with increases projected for Winter and late Summer and decreases in Spring. Specific projected changes are:

- 2030 Precipitation:
  - Annual increase of 0.06 inches or 0.4%
  - Increases in the November to April period; maximum increase in March (0.25 inches or 10%)
  - Decrease in the May through July period; maximum decrease in May (-0.08 inches or -14%)
  - Increase in the August to September period; maximum increase in August (negligible or 9%)
- 2070 Precipitation:
  - Annual decrease of -0.09 inches or -0.6%.
  - Increases in the December to March period; maximum increase in January (0.46 inches or 17%).
  - Decrease in the April through June period; maximum decrease in May (-0.18 inches or -31%).

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- Increase in the July to September period; maximum increase in September (0.05 inches or 25%).

Evapotranspiration

Annual evapotranspiration is projected to increase, by approximately 3.2% to 8.2%. Maximum increases are projected to occur in the Winter and Spring periods. Specific projected changes are:

- 2030 Evapotranspiration:
  - Annual increase of 2.1 inches or 3.2% measured as pan evaporation.
  - Maximum relative increases occur in January (0.06 inches or 4.3%) and June (0.35 inches or 3.8%).
- 2070 Evapotranspiration:
  - Annual increase of 5.3 inches or 8.2% as pan evaporation.
  - Maximum relative increases occur in December (0.18 inches or 12.8%) and May (0.58 inches or 8.0%).

Under these conditions it can be expected that the crop demands for water will generally increase in proportion to the increased evapotranspiration estimates; by approximately 3% to 8% over time.

Runoff

Annual runoff is projected to be reduced by approximately -5% by and after 2030. A significant change is projected to occur in the seasonal distribution of runoff. Under current and the projected 2030 conditions the peak inflows occur, and are projected to occur, in May each year, i.e., in mid Spring. By 2070 inflows are predicted to peak in late Winter, two months earlier than March.

Strom Precipitation

As part of California's Fourth Climate Change Assessment, the California Energy Commission sponsored a study of the projected changes to California's precipitation intensity-duration-frequency curves which evaluated how the intensity and frequency of 1-to-7-day precipitation events would change for extreme storms such as the 25-year to 100-year events, compared to those experienced in from 1950 to 1999. The projections were made for the period 2050 to 2099 (50-years). The work was undertaken by the University of California, Irvine (UCI, 2018).

The general conclusions of the study are that extreme precipitation is expected to increase across most cities in California. Climate model simulations under the RCP8.5[1] project that in the future, the frequency of what is currently a 50-year event could double in both Southern and Northern California. This means that areas across California may experience extreme precipitation that is more intense and twice as frequent, relative to historical records.

[1] A Representative Concentration Pathway (RCP) is a greenhouse gas (GHG) concentration trajectory generally adopted by the Intergovernmental Panel on Climate Change (IPCC) for climate change forecasting. The RCPs describe the possible changes in future anthropogenic (i.e., human) GHG emissions. RCP 4.5 is described by the IPCC as an intermediate scenario. Emissions peak occurs around 2040, and then declines. RCP 8.5 emissions continue to rise throughout the 21st century and this pathway is generally taken as the basis for worst-case climate change scenarios.

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He closest city to the Project that was analyzed is Fresno. Evaluation of the climate change effect on one-day storm precipitation frequencies for Fresno indicates, for example, that the precipitation values for a return period of 100-years would increase by 14% to 19% for the RCP4.5 and RCP8.5 scenarios respectively for the 50-year future projection period. The current storm precipitation amounts would occur more frequently. For example, the annual probability of occurrence of the current 100-year precipitation which is 1% could be increased to between 1.4% and 1.9% respectively, i.e., this storm event would become nearly twice as likely.

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3. BASELINE CONDITIONS

This section contains descriptions of the existing (baseline) Site geologic and hydrologic conditions.

3.1. REGIONAL AND LOCAL GEOLOGY

The Central Valley has been formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west sides (Figure 1). The Central Valley is an alluvial plain, approximately 50 miles wide and 400 miles long (north south). Sediments have been deposited into the Central Valley for the last 160 million years and are thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone and locally granitic rock. Beneath the sedimentary rocks lie an impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000 feet bgs. These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (Faunt et al., 2009). A geologic map of the region is included as Figure 5

A total of 6 soil borings were conducted at the Site in November 2011 (BSK, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Reservoir area ranges between approximately 40 and 100 feet. Alluvial deposits at the Site consist of sand that is about 15-20 feet thick. Luhrdorff and Scalmanini (1995) describe these sediments as Younger Alluvium. Below this sand interval, cobbles, boulders with sand, clay and silt are common. These deposits extended to a depth of about 40 feet on the eastern portion of the Site, and to about 100 feet on the western portion. Luhrdorff and Scalmanini (1995) describe these sediments as Older Alluvium. Geologic cross-sections for the Site have been prepared by Schmidt (2012) and for this study, which are included in Attachment A.

Weathered bedrock was not encountered in borings on the western portion of the Site but was encountered at approximately 77 ft bgs in two borings drilled at the eastern portion of the Site. The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within a few miles to the north, east and south of Site. The weathered bedrock is presumed to underlie the entire Site but is apparently present at various depths (Attachment A). Discontinuous intrusions of clay or clayey sand were also occasionally encountered.

3.2. GROUNDWATER

The shallow aquifer at the Site is composed of the alluvial fan deposits associated with the local rivers. In some areas near the Site where overlying sediments are relatively thin, such as the Lemon Cove and Lindmore areas south of the Site, weathered bedrock forms the predominant aquifer. For example, one Lemon Cove public supply well is screened in the bedrock aquifer.

Most of the groundwater production south of the Kaweah River is from the bedrock interval (Schmidt, 2012).

Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley (Figure 6). Groundwater elevations in the region vary from around 460 feet amsl near the Site, to around 250 ft amsl near the City of Visalia (DWR, 2014). Groundwater is pumped in the area for agricultural and urban uses.

The Site is in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (DWR, 2003). The Site is also near the eastern boundary of the Kaweah Delta Water Conservation District (KDWCD) (District; Figure 7). Approximately 265,000 acres of the district is irrigated for agriculture, and about 45,000 acres is urbanized. Numerous public and private entities within the district boundaries divert water from the river and its distributaries mainly for irrigation. In addition, almost all the land within the KDWCD receives some irrigation water obtained from groundwater, often as a supplement to surface water (Groundwater Sustainability Plan - GWSP, GKGSA, 2020).

KDWCD and surrounding areas have been in long-term groundwater overdraft. The KDWCD wide overdraft for the period 2007 to 2017 was estimated at approximately 78,000 AF/yr. Most of the overdraft occurs in the western portion of the district; not the Project vicinity (GKGSA, 2020).

In January 2020, the Greater Kaweah Sustainability Agency (GKGSA) published its “Groundwater Sustainability Plan” (GWSP). The purpose of the GWSP, is among others, to identify and describe Minimum Thresholds and Measurable Objectives for each monitoring location for each applicable Sustainability Indicator, as required to achieve the Sustainability Goal, and to define and identify Projects and Management Actions proposed by the GKGSA to achieve the Sustainability Goal. The Sustainability Plan area and its jurisdictional boundaries are shown on Figure 8. The Reservoir will be in Hydrogeologic Zone 10 within these boundaries. For this zone, the Minimum Threshold and Measurable Objective groundwater levels have been established for Well KSB-2822 (also referred to as 18S27E05J001M), located between the St. Johns and Kaweah Rivers (Figure 9), as 421 and 420 feet amsl respectively. The levels at KSB-2822 are at the Minimum Threshold and Measurable Objective levels established by the GKGSA).

The shallow aquifer in the Site vicinity is unconfined (Schmidt, 2012) and water levels are significantly higher than the Minimum Threshold and Measurable Objective levels. The long-term water level measurements for wells in the region surrounding the Site indicate stable water levels, except for temporary declines during drought periods (Figure 9). Seasonal water level fluctuations in the Site vicinity have generally varied by less than 20 feet for the last 50 years (Fugro, 2007). Within the Site, approximate water level elevations ranged from 463 feet amsl near the east edge of the Lemon Cove Facility, to just under than 430 feet amsl in the western part of the Site in December 2011 (Figure 10) based on six borings sampled during the site investigation program. The CEMEX excavations located immediately to the north of the Site, have exposed groundwater because of the permitted surface mining on that site. As presented in Attachment B, groundwater level elevations have ranged from about 438 to 443 feet amsl in the area immediately northwest of the Site, to between 456 to 460 feet to the northeast of the Site in the 2008 to 2010 period.

The main source of recharge to the aquifers in the Site area is groundwater flow form the east. Localized groundwater gradients suggests that the St. Johns and Kaweah Rivers lose some of their flow to infiltration, and that these rivers are sources of groundwater recharge. Other sources

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of groundwater recharge in the Site vicinity include infiltration of water used for irrigation, and infiltration from local irrigation ditches in the area and from seasonal surface water flow.

3.3. GROUNDWATER WATER QUALITY

Groundwater in the region is generally considered suitable for beneficial uses, including municipal/domestic, industrial, and agricultural purposes except for a few instances that are discussed below. In the project vicinity, groundwater quality is favorable with respect to physical parameters (total dissolved solids, pH, and specific conductivity), and other major constituents related to potability (such as chloride, and sulfate, and nitrate). Groundwater in the project area generally reflects the properties of local surface water runoff, which serves as a replenishment source. While there are localized occurrences of high dissolved minerals or high nitrate levels due to the influence of land use (e.g., infiltration of irrigation tailwater), groundwater generally satisfies Title 22 Drinking Water Standards and is utilized as a drinking water source for municipalities, small community systems, and individual households. High concentrations of iron and manganese are also known to occur in the region, which in some instances may exceed secondary drinking water standards (Luhdorff and Scalmanini, 2004).

Consistent with the regional characteristics, groundwater quality at the project site is characterized by relatively low conductance and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition. Samples collected from monitoring wells completed in the younger alluvium and the older alluvium at the project site had specific conductance values of 120 to 260 mhos/cm and total dissolved solids (TDS) levels of 95 to 170 mg/l (Jones & Stokes, 1998). Calcium and bicarbonate are the predominant cation and anion. Compared with sources to the west, the groundwater in the project area exhibits lower mineralization due to the apparent influences of surface waters in the Kaweah and St. Johns Rivers (Bookman-Edmonston 1972). ·

Several locations surrounding the project vicinity have experienced degraded groundwater quality in the shallower aquifers due to agricultural practices in the area. Examples include the Lemon Cove area, the areas immediately south of Wutchumna Hill and west of the Reservoir, which have elevated levels of nitrate in groundwater, up to approximately 100 mg/L (Schmidt, 2001).

The City of Woodlake has also reported problems with elevated nitrate concentrations and is concerned with any project that may increase degradation (Jones & Stokes, 1998). Other than nitrate, groundwater and surface water in the Site vicinity appear suitable for existing beneficial uses (Fugro, 2007).

3.4. SURFACE WATER

3.4.1. CURRENT CONDITIONS

The east side of the San Joaquin Valley consists of a broad plain formed by coalescing alluvial fans associated with streams draining the western slopes of the Sierra Nevada (Figure 4). The southern end of the San Joaquin Valley is known as the Tulare Basin. The Tulare Basin is hydrologically closed. Instead of flowing to the ocean, streams from the Sierra Nevada flowing into the Tulare Basin terminate at depressions, the largest of which is the Tulare Lakebed.

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The primary natural surface water bodies in the Site vicinity are the Kaweah and St. Johns Rivers, which form the eastern and southern Site boundaries. The Kaweah River flows westward from its headwaters in the Sierra Nevada. Along the southern Site perimeter at a location referred to as McKay Point, the Kaweah River diverges into two rivers, forming the St. Johns River and the Lower Kaweah River. Several ponds are located just north of the Site at the adjacent CEMEX operation (Figure 2). A pond is also located on the Kaweah River Rock property to the west of the Site. These ponds consist of exposed groundwater, created by previous mining beneath the groundwater elevation.

Downstream of the Site, the Kaweah River historically branched into 8 or 10 shallow channels that overflowed during high flows, creating marshlands. These shallow channels were later integrated into irrigation canals and ditches for the delivery of irrigation water in support of agriculture irrigation. These channels still carry non-irrigation flow to Tulare Lakebed but only during periods of extraordinary precipitation or snow melt (Figure 4; Army Corps, 1990).

In 1962, Lake Kaweah (the Lake), located approximately 3 miles upstream of the Site, was created by the construction of Terminus Dam (Figure 4). Construction of this dam provided storage of irrigation water and flood protection for downstream areas. The Lake has a capacity of approximately 185,630 AF. Flood control considerations require that, between November and March, a portion of the Lake volume be reserved to store runoff in high rainfall or snowmelt events. Therefore, during a wet year the Lake typically releases most of the water to maintain low levels. In a dry years Lake outflow is typically very low in winter with sporadic increases in response to significant precipitation or snowmelt conditions.

Storage for water supply begins in late winter and releases occur in late spring and early summer. In wetter years, releases may begin in late winter and remain high (above 1,500 to 2,000 cfs) through spring and late summer (EPA, 2005; US Army Corp. 2005, Kaweah, and St. Johns Rivers Association - Water Master Reports though 2007). Water released from the Terminus Dam serves multiple local water districts such as the Tulare Irrigation District (TID) and Kaweah Delta Water Conservation District (KDWCD) as well as several small ditch companies. The dam also discharges water to generate hydroelectricity.

During a typical average year streamflow upstream from McKay Point (gauge Kaweah River at McKay Point) is intermittent for about 8 months during late summer through late winter (September through April (Watermaster Reports). When they occur, flows can typically range up to 1,000 to 2,000 cfs. During June and July flows are more consistent with maximum flows still ranging up to approximately 2,000 cfs or higher (Table 2 below).

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TABLE 2: KAWEAH RIVER AT MCKAY POINT – MONTHLY FLOWS – (PERIOD 2001-2020)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average (cfs)	313	355	298	314	731	1,359	1,265	525	94	15	61	127	455
Minimum monthly (cfs)	-	-	-	-	8	454	207	15	-	-	-	-	61
Maximum monthly (cfs)	1,862	2,071	2,241	1,709	2,241	2,303	2,135	1,609	701	178	668	723	1,274
Average (AF)	19,261	19,701	18,301	18,665	44,939	80,854	77,805	32,286	5,577	907	3,637	7,832	329,765
Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020.													

The annual flows vary significantly and since 2001 have ranged from 43,815 AF/year to 922,247 AF/year. The gauged values are summarized in Table 3 below. In approximately 30% of the years the flow is above average, and in the remaining 70% of the years, below average.

TABLE 3: KAWEAH RIVER AT MCKAY POINT – ANNUAL FLOWS IN AF/YEAR – (PERIOD 2001-2020) – BOLD VALUES ARE YEARS WITH ABOVE AVERAGE FLOWS										
Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow	211,316	237,860	**358,716**	176,410	**548,184**	**640,557**	115,958	266,014	242,324	454,670
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
Flow	**746,509**	200,737	99,523	52,893	43,813	287,178	**922,247**	202,334	**631,189**	156,873
Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.										

Flows arriving at McKay point are divided between the St. John and Kaweah Rivers by the McKay Point Structure which consists of two flow control structures, one in the St. Johns and one in the Kaweah River. These water control facilities are owned and operated by the Kaweah Delta Water Conservation District and the Kaweah & St. Johns Rivers Association. Both check structures are located immediately downgradient of McKay Point (Figure 3). The check structures can be closed or opened to control flow rates in the St. Johns and Kaweah Rivers.

Dry Creek flows into the Kaweah between Terminus Dam and McKay Point and is the largest source of runoff below Terminus Dam (Figure 4). Dry Creek flows southward from its headwaters and joins the Kaweah approximately one mile down from Terminus Dam. Water supply diversions begin immediately downstream of the dam through Hawkeye, Lemon Cove, and Foothill Ditches, and flows diverted are less than 10,000 AF/yr. total. Farther downstream, Wutchumna Ditch Company diverts water into Bravo Lake, a 4,000 AF Reservoir (U. S. Army Corps of Engineers, 1990).

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Spills from the irrigation systems of the Kaweah and St. Johns Rivers are limited to the above average years as shown by the measured flows in Table 4.

TABLE 4: SPILLAGES FROM THE KAWEAH AND ST. JOHNS RIVER IRRIGATION AREAS MEASURED AT (1) ELK BAYOU BELOW ROAD 96 AND (2) CROSS CREEK AT HIGHWAY 43 TO TULARE LAKE – ANNUAL FLOWS IN AF/YEAR – (PERIOD 2001-2020)

Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow (1)	0	0	530	0	201	9,940	0	0	0	0
Flow (2)	0	0	0	0	0	19,406	0	0	0	0
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-110
Flow (1)	11,833	0	0	0	0	0	8,028	0	3,521	0
Flow (2)	0	0	0	0	0	0	37,814	0	331	0

Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.

3.5. FLOODING

Before the Terminus Dam was constructed, extraordinary storm events in December 1955 resulted in an estimated peak flood discharge at McKay Point of 87,000 cfs, which is the largest peak runoff from the Kaweah River watershed in the 20th century. Since the construction of Terminus Dam in 1962, most flooding concerns for areas downstream of the dam were greatly alleviated. For example, the peak average daily inflow to Lake Kaweah during the 1966 flood was 105,000 cfs, whereas the maximum release from the dam was 5,666 cfs. Lake Kaweah is operated with an objective of maintaining a flow of less than 5,500 cfs at McKay Point, which includes flow from undammed tributaries such as Dry Creek. Above this flow rate, flood damage can occur to downstream properties, infrastructure, and municipalities (U. S. Army Corps of Engineers, 1990).

The Terminus Dam height was increased by approximately 21 feet in 2004, which further reduced flooding in the area (U. S. Army Corps of Engineers, 2005). It is estimated that currently the dam provides protection for a design flood event of 50-year return period (FEMA, 2009).

FEMA has prepared a flood hazard map for the area including the Site (Figure 11). FEMA has calculated base flood elevations for the Kaweah and St. Johns Rivers, but only for stretches downstream of McKay Point. The map indicates that the 100-year flood level near the Site along the St. Johns River is approximately 465 feet amsl. During most flooding conditions, major and minor flooding in the area is dissipated by diversions to the network of irrigation ditches, irrigation diversions, channel percolation, and evapotranspiration (U. S. Army Corps of Engineers, 1990).

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3.6. SURFACE WATER QUALITY

Surface water near the project Site is generally considered suitable for beneficial uses including municipal, domestic, agricultural and groundwater recharge purposes. Virtually all municipal and industrial water supply in the region is derived from groundwater and surface water is essentially used exclusively for agricultural purposes. As such, the surface water quality is classified as Class I for irrigation by the Department of Water Resources. The water is characterized by relatively low conductance and dissolved solids and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition (Luhdorff & Scalmanini, 2004)

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4. PROJECT DISCUSSION

4.1. INTRODUCTION

This section describes the reservoir objectives, includes a discussion of the initial excavation and final construction of the Reservoir, the design of the excavation, slurry wall, and final Reservoir. It provides the water balance analyses for both the excavation and Reservoir operational stages and describes how the reservoir would be operated. The section concludes with an analysis of the water supply and flood control benefits that would be achieved.

4.2. RESERVOIR OBJECTIVES

Once the Reservoir is completed, the Owners will utilize the Reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, groundwater recharge supplies, and to provide for additional flood flow reductions by temporarily storing high flood waters. Its purpose is to provide multiple benefits including:

- Capturing and re-regulating water made available to the Owners during flood releases from Terminus Dam.
- Capturing and re-regulating water entitlements belonging to the Owners released from Terminus.
- Capturing and re-regulating any other water sources on the Kaweah River, such as Dry Creek, that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Effectively extending the Owners' irrigation and/or groundwater recharge season by storing additional Kaweah River water during events in which the Owners' delivery systems are at capacity.

The Reservoir would be constructed in such a way that revenue can be obtained to offset the construction and development costs. Locating the Reservoir adjacent to the Kaweah River allows for easy connection between the river and the Reservoir, thus minimizing the need for pipelines. The elevation of the water surface above McKay Point in the Kaweah River will be used to divert water into the reservoir by gravity.

4.3. RESERVOIR CONSTRUCTION

4.3.1. APPROACH

The proposed Reservoir would occupy a surface area of approximately 130 acres, have an average water depth of 60 to 80 feet, and would have storage capacity of approximately 4,600

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acre-feet (Figures 3 and 12). Final side slopes will be approximately 3:1, horizontal: vertical (H:V), to maximize stability and minimize bank erosion from wind, water, and waves. The upper portions of the Reservoir slopes for several feet above and below the full Reservoir water level will be covered with suitable riprap from natural stone sources or processed construction concrete debris to prevent wave action from eroding the surface.

4.3.2. EXCAVATION

Over the estimated approximate 15- to 23-year excavation phase, excavation is expected to proceed at annual rates of up to approximately 920,000 gross tons per year of silts, sands, and gravels, although this rate will likely vary in any given year. The excavation equipment, the material processing plant and associated settling pond would be located within the Reservoir perimeter as shown in Figure 13. Different areas of the excavation bottom would be lowered in stages and the process equipment relocated as appropriate. The excavated materials would be processed to produce a specified range of granular construction materials and sold. The work would be done by WCA. WCA would also receive, stockpile, and recycle concrete construction debris materials.

During the initial excavation and material processing stage, an impermeable slurry wall will be constructed around the exaction area to limit the amount of groundwater flow into the excavation as excavation progresses below the water table.

The WCA excavation phase (Figure 13) would include the following key facilities:

- A security fence that surrounds the excavation and eventual Reservoir area.
- A controlled access gate along the west side of the excavation area.
- A scale hose near the entrance gate to provide for weighing recycle materials coming into the site and construction materials being shipped from the site.
- A haul truck unloading and loading area.
- Portable crusher and recycle plant.
- Portable diesel fuel tank for onsite equipment (4,000 gallon).
- An aggregated production (wash/screen) plant.
- A stockpile area, or areas.
- A slurry wall.
- A settling pond for clarifying/recycling process and wash water for reuse.

As shown on Figure 13 the excavations would occur within the footprint of the total area and be expanded and deepened over time. The initial excavation area shown in Figures 13 and 14, is approximately sufficient for a 6-month supply of processed material. Typically, the side slopes of the excavation will be 1.5 to 1 (Horizontal: Vertical). It should be noted that the layout and facilities shown on the figure are for illustrative purpose and WCA will refine and adjust these as necessary at the start of the excavation program, keeping all the operations within the excavation footprint.

During excavation phase, the area would be dewatered, as needed, by a series of wells constructed within the excavation area to draw down the water table to below the excavation floor. Seepage calculations (Attachment D) indicate these extraction rates would initially be minimal and increase to their maximum as the excavation is deepened to the maximum depth, i.e.

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- Initial rate: 0 gpm
- Final rate: approximately 220 gpm

The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel fill infiltration gallery along and outside of the northern border of the slurry wall as shown on Figures 3, 13 and 14. This groundwater pumping would therefore not result in a consumptive loss of water.

The slurry wall will be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. Construction would include the following facilities:

- A perimeter access road that would also serve as a leveling surface for the construction of the slurry wall. The road would vary in width from approximately 30 to 50 feet and be built on fill up to 8 foot in height.
- An approximately 60- to 80-foot-deep slurry wall surrounding the excavation/Reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow. As shown on Figure 15, the slurry wall would be constructed through the perimeter road and capped off with a durable gravel layer.
- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate Reservoir area (Figures 15 and 16).

It is anticipated construction would take approximately 6 months and would include the following on-site facilities as shown on Figure 13. After completion of the slurry wall these facilities would be demobilized from the site:

- Vehicle and equipment parking areas.
- A fill material stockpile area.
- Equipment storage area.
- A bentonite slurry mixing pond (see further discussion below on the slurry wall construction activities).
- A slurry wall backfill mixing area that would be moved along with the construction of the slurry wall, so it is always adjacent to the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench (Figure 15) through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the WCA operations for processing as appropriate. The crushed concrete from offsite recycling may also be used as final riprap protection on the Reservoir slopes.

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- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Either suitable durable excavated granular material will be used, or suitable material will be obtained from the WCA operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill material displaces the bentonite slurry in the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400 feet and its width is typically 3 feet.
- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road as shown on Figure 15.
- A road safety berm will also be constructed along the inside of the road facing the excavation area.
- As the excavation of the reservoir is deepened an access ramp as shown on Figure 16 will be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

The longitudinal section through the initial and final excavation is shown on Figure 14. The excavation configuration is relatively shallow compared to its length (horizontal to vertical dimensions are of the order of 100 to 1).

The material balance is as follows:

- Excavated to a 1.5 to 1 slope: 16.4 million tons (11,050,000 cy)
- Use of excavated materials:
    - Exported as product: 11.5 million tons
    - Use for 3 to 1 fill: 2.4 million tons (based on a 75% usability factor)
    - Use for road construction 0.1 million tons
    - Other uses 2.5 million tons

Compared to the above volumes the volume of the slurry wall is much less, at approximately 112,000 cy (0.2 million tons).

4.3.3. RESERVOIR

Construction of the Reservoir would be initiated during the final stages of the excavation and material processing, or if necessary, at a later stage. It would include two major construction activities:

- Backfilling of the excavation slopes to flatten them from 1.5 to 1 to 3.0 to 1. This is shown on Figures 14, 15 and 16. The backfill would be of suitable materials that has both sufficient strength and is relatively free draining. It would be constructed from the bottom up in compacted layers of suitable thickness. Figure 16 shows the first layer of the backfill being placed along the east side of the excavation.

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- The second major activity would include construction of the following components (Figure 17):
    - Inflow Channel - controlled by gates
    - Electrically operated slide gates in the Inflow Channel.
    - Inflow Chute – with rip-rap erosion protection.
    - Energy Dissipation Pool - Based upon the drilling logs, it is expected bedrock will be encountered at the proposed final elevation of the Inflow Chute. However, if the excavation does not get down to bedrock, installation of an energy dissipation pool at the base of the Inflow Chute would prevent potential scouring of the excavation slope by water entering the Reservoir.
    - Floating Barge Pump and Discharge Pipeline to deliver into the Kaweah River upstream of the existing McKay Point Structures.
    - Above-Ground Diesel Tank, Generators and Generator Building.
    - Outflow Channel into the St. Johns River.
    - Electrically Operated Weir for the Outflow Channel.
    - Supervisory Control and Data Acquisition (SCADA) equipment would be used to monitor Reservoir levels and conditions, and to operate the Inflow Channel, Outflow Channel, and Floating Barge Pump.

4.4. DESIGN

Conceptual level designs have been completed for the purposes of this report. These are described in the Geology and Soils Technical Study (SLR, 2021), and are at a level of detail that allows for the evaluation of the impacts and benefits associated with the proposed facilities. A brief discussion is also provided of the typical detailed design activities that would be performed before the facilities are constructed.

Conceptual designs of the various reservoir components discussed in Section 4.3.3 above are provided by Provost and Pritchard.

4.5. WATER BALANCE

4.5.1. DURING EXCAVATION

Processing will include both crushing and screening as well as washing. A total water flow rate of up to 1,500 gpm will be required for these processes. The used water will be collected and conveyed to a settling pond in the bottom of the excavation where the washed-out fine material would settle, and the clarified water would be recycled back to the processing plant with the remainder infiltrating back into groundwater under the excavation area. A much smaller amount of makeup water would be required to replace the water lost in the processing and water used for dust control at the Site. This water would be extracted from several wells located within the excavation area, the same wells that are used to dewater the excavation. Estimated makeup water requirements (or consumptive use of water during the construction period) amount to:

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- Losses in the processing: 110 AF/year
- Settling pond evaporation: 1 AF/year
- Dust control water: 30 AF/year

  Total: 141 AF/year

The processing will also result in the accumulation of fine silt which collects in the bottom of the settling pond, some of which may be used as a soil amendment onsite in association with revegetation activities, and in construction of safety and slope stabilization berms.

During excavation the groundwater extracted to maintain dry conditions would be pumped back into the infiltration trench so would not represent a consumptive use.

4.5.2. DURING RESERVOIR OPERATIONS

Water balance analyses have been performed to assess how the Reservoir would typically be operated and how much consumptive use is associated with these operations. Water loss would occur form:

- Evaporative loss from the moist surface of the Reservoir when it is maintained in an empty condition.
- Evaporative loss from the Reservoirs surface when it is full, or partially full.

Estimated consumptive use during a year when the reservoir is operating is approximately 200 AF. During years when the reservoir is not used, net evaporation losses range from insignificant for the case where the Reservoir is maintained empty by continuous pumping of the inflowing groundwater into the infiltration trench, to approximately 340 AF for the case when the Reservoir is maintained in a filled condition, thus saving the pumping energy consumption.

4.6. ANTICIPATED RESERVOIR OPERATIONS

4.6.1. INFLOW CHANNEL MANAGEMENT

The Inflow and Outflow Channels will be constructed perpendicular to the Kaweah and St. Johns Rivers (Figures 3 and 17). The Inflow Channel will provide flow into the Reservoir via a reinforced concrete control structure. The control structure would include an approach apron, reinforced concrete floor, flow/level control gates, walls, and a deck on top of the structure. The existing check structures downstream of McKay Point and the proposed inlet gates would control the flow rate into the Reservoir (Provost and Pritchard, 2014).

To divert river water into the Reservoir, when the river water level is higher than that of the Reservoir, the Electrically Operated Weir on the Inflow Channel would be opened. Water would flow by gravity into the Reservoir up to a maximum flow capacity of up to 3,500 cfs and an average of approximately 2,400 cfs as the Reservoir fills up. Upon achieving water level equilibrium between Reservoir and river, the Electrically Operated Weir would be closed. As the level of the river recedes, the Electrically Operated Weir would serve to hold water in the Reservoir.

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4.6.2. OUTFLOW CHANNEL MANAGEMENT

Gravity-Flow Water Delivery into The St. Johns River and Kaweah River

The gravity Outflow Channel for the Reservoir is located downstream of the St. John's check structure (Figures 3 and 17). The discharge capacity of the outlet is currently estimated to be approximately 900 cubic feet per second. The outlet could gravity drain up to approximately 1,100-acre feet of the Reservoir into the St. Johns River. A proposed floating pump would empty the remaining 3,500 acre-feet stored in the Reservoir. Discharge capacity of the floating pump is currently estimated to be 160 cubic feet per second and would discharge upstream of McKay's Point allowing for diversions into either the St. Johns or the Lower Kaweah River (Provost and Pritchard, 2014).

When the St. Johns River water level is lower than that of the Reservoir, lowering the Electrically Operated Weir on the Outflow Channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs. The average flow rate will be approximately 350 cfs because the flow rate would reduce gradually to zero as the level of the Reservoir approaches the level of the Outflow Channel.

The Outflow Channel will include a riprap or concrete apron, constructed across the riverbed of the St. Johns River when dry. This apron will prevent the potential scouring effects of the water entering the river.

The Inflow Channel could also be used as an Outflow Channel to deliver releases to the Kaweah River. It also includes riprap protection in the river. When the Kaweah River water level is lower than that of the Reservoir, lowering the Electrically Operated Weir on the Inflow Channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs (the Inflow Channel could be used for inflow or outflow). The average flow rate of return will approximate 200 cfs because the flow rate would reduce gradually to zero as the level of the Reservoir approaches the level of the Inflow Channel.

Water delivery in this manner is limited by the amount of water being stored at a level higher than that of the Inflow Channel (i.e., approximately 15 feet of additional storage). Once the level of the Reservoir falls below that of the Inflow Channel, the Floating Barge Pump will be used.

Pumped Water Delivery into The St. Johns and Lower Kaweah River

To release water to the St. Johns River or the Lower Kaweah River when the river water levels are higher than that of the Reservoir, the Floating Barge Pump will pump water from the Reservoir, via the Floating Barge Pump Discharge, into the Kaweah River, upstream of the McKay Point Structure.

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4.6.3. RESEVOIR OPERATIONS

The Reservoir would be operated in one of the following modes:

- *Water Conservation Mode* during which excess water would be stored in the Reservoir for later release downstream for irrigation use or groundwater recharge.
- *Flood Control Mode* during which the Reservoir would be used to store flood peaks to alleviate downstream flood damage.
- *Dual Use Mode* during which the Reservoir would be operated either for conservation or flood control.

From mid-April through the end of October, the Reservoir would be in *Water Conservation Mode* for water supply re-regulation. It is anticipated that the Reservoir would fill for the final time with flood water or otherwise storable Owner entitlement. Before the end of the irrigation season the Reservoir would be emptied to meet Owner irrigation demand and would remain empty for the upcoming flood season.

From the beginning of November to the end of January the Reservoir would be in *Flood Control Mode*. Flood peaks resulting from Terminus dam release and flood flows in the unregulated Dry Creek which exceed a stipulated flow rate would be diverted into the Reservoir to decrease downstream flood flows. Further discussion of this control mode is provided in Section 4.6.5 below.

From early February through mid-April approximately, the Reservoir would be in a *Dual Use Mode* which involves the overlapping of two operational drivers: *Flood Control* and Water *Conservation Modes*. During this period the Reservoir would be filled based on the availability of refused floodwater and the need to have an empty Reservoir for flood mitigation given forecasted weather conditions.

The Reservoir could be filled in a few days, depending on the flow in the Kaweah River and would decrease the peak flood flows. The quickest the Reservoir could be completely dewatered would be in approximately 12 days.

4.6.4. WATER SUPPLY BENEFITS (*CONSERVATION MODE* OPERATION)

Tulare Irrigation District (TID) has established a water balance model that simulates the irrigation water system from the outflow from Terminus Dam and Dry Creek down to the spill areas Cross Creek at Highway 43 into Tulare Lake, including supplies from, and exchanges with the Central Valley Project (CVP) and the Friant-Kern Canal, and the demands of the TID and the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC). The model incorporates the Reservoir operation. This model has been used to illustrate Reservoir operations for the climatic conditions observed for ten years from 2010 to 2019. The results of these simulations are shown in Figures 18A through 18E, and the associated agricultural water gains are summarized in Table 5[2]. These results indicate that the Reservoir benefits occur when the mean annul flow conditions exceed approximately 50% of the long-term mean annual flow, or in 6 out of the 11 years simulated. In these years, it would have benefited agencies to put Kaweah

[2] Note that the year 2017-18 is not plotted in the Figure 18 series since the additional water provided is very small.

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water into the Reservoir to be able to take Central Valley Project (CVP) water during events in which Owners' delivery systems were at capacity due to a combination of Kaweah and CVP water and there was surplus CVP water available which had to be refused to avoid additional spill on the Kaweah system.

As shown on Figure 18A for example, the solid red line indicates the period of the *Flood Control Mode*, the dashed red line indicates the duration of the *Dual Use Mode,* and the remaining period corresponds to the *Conservation Mode*. As noted from this figure there were no diversions for flood control purposes. During the *Dual Use* and *Conservation Mode* periods water was transferred into the Reservoir in the April and May, and smaller amounts in June and August as indicated by the green dashed line. This stored water would have been used in May and again in July and August as indicated by the dotted blue line. The corresponding Reservoir volumes are indicated by the solid blue line

TABLE 5 SUMMARY OF ANNUAL AGRICULTURAL BENEFITS

Year	Annual Precipitation at Terminus Reservoir		Annual Runoff of Kaweah River at McKay Point		Agricultural Benefit	
	Inches	% Of Long-Term Mean	Acre Feet	% Of Long-Term Mean	Additional Water Provided for D/S Use (AF)	Number Of Major Water Supply Events
2009-10	18.96	127%	454,670	122%	7,092	2
2010-11	22.38	150%	746,509	201%	6,910	2
2011-12	12.23	82%	200,737	54%	4,600	1
2012-13	6.77	45%	99,523	27%	-	
2013-14	6.15	41%	52,893	14%	-	
2014-15	8.97	60%	43,813	12%	-	
2015-16	18.39	123%	287,178	77%	-	
2016-17	19.89	133%	922,247	248%	5,842	1
2017-18	8.93	60%	202,334	54%	61	1
2018-19	17.33	116%	631,189	170%	11,445	2
AVERAGE ANNUAL	14.94	100%	371,790	371,790	3,595	1.5

The benefits of the *Conservation Mode* operations are expected to increase for climate change scenarios. While the total annual runoff changes are minor (a reduction of up to 5%, Section 2.3.2) the higher seasonal flows are projected to occur earlier in the year likely resulting in increased flood releases from Terminus Dam. With the Reservoir in place these earlier releases could be stored and then used to increase the CVP water by a like amount later in the year. Furthermore, use of the Reservoir will more critical since overall, less runoff will be available, making it more important to reduce any spillage of unused water by storing it in the Reservoir.

4.6.5. FLOOD MANAGEMENT BENEFITS (*FLOOD CONTROL MODE* OPERATIONS)

The Terminus Dam and Kaweah Project is operated so that flows do not exceed 5,500 cfs in the Kaweah at McKay Point to protect the downstream municipalities, rural communities, and agricultural lands in the Tulare Lakebed from flood damage. (USACOE, Revised 2005). Dry Creek is the major uncontrolled tributary to the Kaweah River below Terminus Dam and upstream of the Reservoir. This tributary can produce high magnitude flows that require rapid release changes from the dam if the impact is to be reduced, since there are no flood control measures in place for these flows.

Flood attenuation benefits were assessed by considering the three largest instantaneous flood peak flows that were recorded on Dry Creek between 1960 and 1997. As shown on Table 6, these include:

- December 6, 1966 (peak flow = 14,500 cfs).
- January 25, 1969 (6,070 cfs).
- January 2, 1997 (4,380 cfs).

Operations of Terminus Dam allowed for low release rates on these flood days to compensate for the higher Dry Creek flows as shown by the measured average daily flows in Table 6 (column 3). However even with these reduced discharges the flood peak flows in the Kaweah River at McKay point were still elevated as shown in the 4th column of Table 6, i.e., 4,508, 6,646 and 15,549 cfs respectively. In extremely wet years such as 2017, it would be desirable to have the Reservoir absorb the Dry Creek flows so that Terminus can keep releasing as opposed to reducing releases from Terminus, thereby keeping storage available for flood inflow to Terminus (Watermaster of the Kaweah Delta).

Flood routing simulations were conducted to assess how much the Reservoir, had it been in pace, could have reduced these flood peaks. For these simulations it was assumed that once the Kaweah River at McKay Point flows exceed 2,500 cfs, the excess flows up to the maximum capacity of the inlet to the Reservoir (3,500 cfs[3]) are diverted into the Reservoir. As shown by the results listed in Table 6 (column 5), it would have been possible to reduce the flows to below approximately 3,000 cfs in the river, except for the very large December 1966 flood. Even for this event the flood peak would have been reduced to 12,472 cfs, a reduction of 3,068 cfs.

Figure 19 shows which day of the year the measured annual maximum flood peaks occurred in Dry Creek, and these can be considered to cover the periods during which future large floods may occur and during which the Reservoir could potentially be used for flood control purposes. The solid lines in the chart indicate the approximate starts and finishes to the *Flood Control Mode* period that could be considered. These periods would include:

- November 1 would be the start of the flood control operations during which the Reservoir would exclusively be used for flood control purposes and emptied after each flood storage event in anticipation of the next flood event. The released water could be used for recharge in a variety of basins around TID ranging from several acres to 150 acres in size.
- January 31 would be considered the end of the *Flood Control Mode* period.

[3] This assumes the gates will all be opened to provide for the maximum inflow capacity during a flood event. During normal operations inflow rates would be less.

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- February 1 through April 15 would be considered a *Dual Use Mode* period during which water from a projected large flood would be stored in the Reservoir, but after the flood the water would only be released in accordance the which agricultural demand as discussed in Section 4.6.4.

TABLE 6: KAWEAH RIVER AT MCKAY POINT – ANNUAL FLOWS						
HISTORIC FLOOD FLOW DATA				SIMULATED EFFECT OF STORING FLOOD FLOWS ABOVE 2,500 CFS[4] IN RESERVOIR		
DATE	MEASURED INSTANTANEOUS PEAK DRY CREEK FLOW RATE (CFS)	MEASURED AVERAGE SAME DAY DAILY OUTFLOW FROM TERMINUS DAM (CFS)[5]	CALCULATED MAXIMUM INSTANTANEOUS PEAK FLOW IN KAWEAH AT McKAY POINT (CFS)[6]	REDUCED FLOOD FLOWS TO DOWNSTREAM OF RESERVOIR (CFS)[7]	REDUCTION IN KAWEAH RIVER AT McKAY POINT FLOW BY STORING FLOOD WATER IN THE RESERVOIR (CFS)	RESERVOIR STORAGE UNTILIZED (AF)
December 6, 1966	14,500	1,040	15,540	12,472	3,068[8]	4,600
January 25, 1969	6,070	576	6,646	3,146	3,500	2,429
January 2, 1997	4,380	128	4,508	2,628	1,880	939

The flood routing was repeated for the estimated 10-year to 100-year flood peaks at McKay Point developed by FEMA and discussed in Section 3.5 above. The results are provided in Table 7 showing the reductions that could be achieved. It is evident that the Reservoir could reduce flood peaks to below the target 5,500 cfs for flood events up to approximately the one in 50-year event. For larger floods, it would still be possible to reduce the flood peaks, however it would not be possible to meet the 5,500 cfs target at McKay Point.

In conclusion the Reservoir would have the ability to capture some of the floodwater from large floods in Dry Creek, where it would be held until it can be safely returned to the Kaweah and St. Johns rivers for direct use or recharge. The Reservoir has the capacity to reduce flood peak up to approximately the 50-year return period event to below the Target 5,5000 cfs. There would still be a benefit during still larger floods in reducing the peak flow rates.

[4] The 2,500 cfs has been set as a threshold above which water is diverted into the Reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.
[5] Based on the difference between the measured average daily flows at "Dry Creek" from "Total Kaweah River at McKay Point" as recorded in the Water Master Reports.
[6] Sum of the measured instantaneous Dry Creek flow and the average daily outflow from the Terminus Dam
[7] Based on flood routing through the Reservoir.
[8] It was not possible to reduce the flood peak by the capacity of the inlet structure because the reservoir was filled with flood water before the actual peak river flow occurred.

TABLE 7 SIMULATED EFFECT OF STORING FLOOD FLOWS ABOVE 2,500 CFS[9] IN RESERVOIR				
DATE	ESTIMATED MAXIMUM INSTANTANEOUS PEAK FLOW IN KAWEAH AT McKAY POINT (CFS)[10]	REDUCED FLOOD FLOWS TO DOWNSTREAM OF RESERVOIR (CFS)	REDUCTION IN KAWEAH RIVER AT McKAY POINT FLOW BY STORING FLOOD WATER IN THE RESERVOIR (CFS)	RESERVOIR STORAGE UNTILIZED (AF)
100-year	18,456	16,706	1,750	4,600
50-year	8,725	5,225	3,500	3,998
10-year	4,400	2,500	1,900	955

Since climate change is expected to result in increased intensities of flood events, more frequent flood events, and earlier arrival of high winter flows. Under these conditions the Reservoir would provide for increased flood control benefits. For example, as discussed in Section 2.3.2, flood peaks for the current frequencies are expected to occur almost twice as often. This would mean that instead of the Reservoir contribution to flood reductions for storms exceeding the 10-year event, it would be more useful and would be able to provide for reductions in flood flows for storms exceeding the 5-year event. This means that over a Project life of 50-year say, instead of the Reservoir being used approximately 5 times, it would be used approximately 10 times.

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[9] The 3,500 cfs has been set as a threshold above which water is diverted into the Reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.

[10] Based on FEMA estimates

5. POTENTIAL IMPACTS

5.1. CEQA SIGNIFICANCE CRITERIA

Hydrology and water quality impacts are described in subsequent sections based on an evaluation of existing Site surface and groundwater hydrology and water quality conditions, and consideration of Project water consumption and potential changes to surface and groundwater hydrology and quality due to Project ground disturbance and land uses. A hydrology or water quality impact is considered significant if it would result in any of the following, adapted from the CEQA Guidelines, Appendix G:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater water quality.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

c) Substantially alter the existing drainage pattern of the Site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

d) Substantially alter the existing drainage pattern of the Site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-Site.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, cause flooding on- /or off-Site, or provide substantial additional sources of polluted runoff.

f) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

g) Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding because of the failure of a levee or dam; or

i) Inundation by seiche, tsunami, or mudflow.

Regarding item “f”, the Project does not include the construction of housing. As a result, this criterion has been eliminated from further consideration.

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5.2. IMPACT HWQ 1 (CRITERION "a"): THE PROJECT COULD RESULT IN IMPACTS TO WATER QUALITY

The potential for water quality impacts to be caused by the Project due to the use and storage of fuels and chemicals, and possibly due to runoff from the Project Area, is evaluated below.

Any unacceptable impacts due to suspended sediment entrainment in surface water would be prevented by the appropriate engineering measures and regulated under the State Water Resources Control Board's (SWRCB's) General Storm Water Permit. These measures are discussed further below.

5.2.1. USE OF FUELS AND OTHER CHEMICALS FOR EQUIPMENT OPERATION AND MAINTENANCE

The use of hazardous materials during Reservoir construction and operation would mainly include fuels, lubricants, and fluids associated with vehicles and equipment. Hazardous materials used as part of construction operations on onsite equipment and vehicles would primarily include fuels and lubricants. Any spill from vehicles or equipment would likely be small and would be promptly and easily cleaned up and disposed of in accordance with State and County regulations.

During Reservoir excavation and construction, hazardous materials will not be stored onsite. Only minor maintenance of equipment and vehicles would be conducted onsite, and vehicles would be fueled by a mobile fuel truck. These activities would be done within the excavation area (Figure 13) where the receipt, storage, handling, use and disposition of these materials in compliance with the requirements of the approved Business Plan, Hazardous Materials Inventory.

Construction will include the installation of an above-ground diesel storage tank, diesel generators, and a generator building near the Inflow Channel. Except for the fluids stored in or on the vehicles and equipment, and, during operations, one AST containing diesel fuel (see below), hazardous materials will not be stored within the Project site. The AST will be used to operate a floating pump in connection with Reservoir operations and will not be used for fueling of vehicles or equipment. Therefore, dispenser-related spillage will not occur

The AST will be dual walled for leak protection. Filling of the AST will only occur in a designated area underlain by concrete paving or a protected flexible membrane liner to facilitate spill cleanup and to inhibit migration of fuel contaminants into the soil column. The Diesel AST will be managed in accordance with a Spill Prevention, Control and Countermeasure (SPCC) Plan. Storage, transfer, spill avoidance, and spill response procedures will be documented in the SPCC Plan.

The AST will not be in an area predicted to be inundated by a 100-year flood, as described in subsequent sections, and as shown on Figure 11. Therefore, damage of the AST because of flooding is not anticipated.

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5.2.2. STORM WATER RUNOFF

The SWRCB (Board) has jurisdiction throughout California. Created by the State Legislature in 1967, the Board protects water quality by setting statewide policy, coordinating, and supporting the Regional Water Board efforts, and reviewing petitions that contest Regional Board actions. Nine Regional Water Quality Control Boards exercise rule making and regulatory activities by basins. Tulare County falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB). As such, the Project is subject to the requirements of the *Water Quality Control Plan for the Tulare Lake Basin*, revised January 2004.

The SWRCB issued a statewide Industrial General Storm Water Permit (Permit) that applies to all industrial storm water discharges. The SWRCB adopted a new Permit that took effect July 1, 2020.

The Owners will obtain coverage under the Permit, as required. Storm water runoff from the Project Area would be managed through proper implementation of Best Management Practices (BMPs such as sediment and erosion control measures) as described in the Stormwater Pollution Prevention Plan (SWPPP). The primary objective of the SWPPP and BMPs is to ensure that polluted runoff, including runoff containing suspended solids and sediment, does not leave the Site and degrade other water bodies. The SWPPP will contain descriptions of aspects such as potential discharge areas, significant materials, and BMPs. BMPs also include non-structural elements such as employee training, documented operating procedures, and general housekeeping. Compliance with applicable storm water regulations will prevent impacts to water quality.

The Project is designed to divert water from the Kaweah River and store this water for later release downstream for use by irrigation water customers. The Project design incorporates engineering measures such as concrete slabs and riprap to prevent erosion and entrainment of suspended solids at the inlets and outlets to the Reservoir where higher water velocities are expected to occur. The Project will not create large areas of impermeable surfaces and will not result in increased rates of surface runoff. In fact, the Project will serve to capture rainfall, thereby reducing surface runoff compared to baseline conditions. Geologic materials exposed in the Reservoir will consist of natural sediments which do not contain deleterious materials or chemical constituents capable of degrading groundwater. Process water will not be generated or discharged to groundwater or surface water as part of the Project. Therefore, the Project is not expected to produce additional runoff, or convey pollutants to surrounding waterbodies.

During the construction phase, energy dissipaters such as sediment catchment basins or sumps, rock dams, and berms, will reduce erosion, trap sediment, and minimize the potential for off-site transport of pollutants. During the excavation phase of the construction, activities will take place inside the excavation itself, thereby preventing any runoff from these activities from entering the rivers. Operations will minimize the extent of disturbed areas. Discharges of storm water runoff from the Site will decrease. Runoff will be directed into the Reservoir or local detention areas to the extent practical.

The final side slopes for the reservoir will be protected from erosion by wind-wave action by the placement of suitable granular material including riprap to armor these surfaces. The perimeter

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road will be graded to direct runoff into the Reservoir or onsite detention areas instead of toward the rivers. Also, the road will continue to be inspected and maintained regularly. Inspections of the road condition and the status of sediment and erosion control measures will be integrated with regular required storm water inspection pursuant to the Permit.

5.2.3. DISCHARGES FROM RESERVOIR COULD CONTAIN SUSPENDED SOLIDS

The Owners may choose to fill the Reservoir during high flow conditions, which may occur in response to periods of extraordinary precipitation. High flow conditions will naturally entrain soil particles from the banks or bottom of the river. As a result, water diverted into the Reservoir may contain elevated concentrations of sediments. Releases from the Reservoir containing excessive sediments could violate the Basin Plan water quality objectives (WQOs), and adversely affect beneficial uses that are designated for the St. John River.

During the time water is stored within the Reservoir, sufficient time will be allowed for settlement of sediments to occur to assure that the discharged water will meet the WQOs with respect to suspended sediment and turbidity.

5.2.4. CONCLUSION

The Project is not expected to cause increased siltation or degrade water quality of surface waters or groundwater, or cause violations of water quality criteria. The Site will be subject to conditions of the SWPPP and SPCC Plan, including provisions for inspections, monitoring, and reporting. The Project involves creation of a Reservoir, which is a topographic depression that will reduce runoff discharges from the Site and vicinity. As a result of proper implementation of sediment and erosion control measures, the Project is not expected to exacerbate the pollutant load of St. Johns or Kaweah Rivers.

Major maintenance of the trucks and equipment will be conducted at approved facilities located outside of the Project area, both during the excavation. construction and operational phases. During the excavation and construction of the Reservoir trucks and equipment will be fueled onsite with mobile fuel trucks within the excavation area. Since the AST will be constructed, operated, and maintained in accordance with applicable regulations, the probability of an onsite spill is minimized. As a result of the factors discussed above, this analysis concludes that the Project would have a less than significant impact on water quality under criterion “a” above.

Level of Significance Before Mitigation: Less than significant
Mitigation Measures: None Required

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5.3. IMPACT HWQ2 (b): THE PROJECT COULD IMPACT GROUNDWATER SUPPLIES, GROUNDWATER LEVELS, AND/OR RECHARGE

5.3.1. SLURRY WALL INSTALLATION

As noted above, a slurry wall, installed initially during excavation of the Reservoir, will decrease the flux of groundwater between the Reservoir/excavation and surrounding aquifer. Slurry walls are underground walls made of bentonite (clay) mixtures that are installed to inhibit groundwater flow. In this case, the slurry wall would be installed around the Reservoir perimeter to decrease groundwater seepage flowing into the Reservoir during excavation and construction phases, and to keep the Reservoir in a relatively dry condition when not being used for storage. The slurry wall would be installed from elevations above the groundwater levels and extend upwards into the Reservoir's perimeter berm as needed to contain water stored in the Reservoir above groundwater levels and downwards into natural lower permeability materials as discussed in Section 4.1.

The slurry wall would be a permanent fixture of the Reservoir and would serve as an essential feature to achieve the following:

- Assist in maintaining dewatered storage capacity to receive surface water diversions.
- Keep groundwater out of the Reservoir to minimize aquifer impacts and provide maximum space to receive Kaweah River water; and
- Inhibit losses of surface water stored in the Reservoir to the surrounding aquifer when the Reservoir is full.

It is recognized that even with the slurry wall installed there will be groundwater seepage into the Reservoir from under the slurry wall when the Reservoir is empty and some leakage of stored water to groundwater when the Reservoir is full. How this seepage/leakage is managed is described in Section 4.1 and in the discussion below.

5.3.2. DRY RESERVOIR CONDITIONS

Dry reservoir conditions will exist during construction after slurry wall installation. Dry Reservoir conditions will also exist during Reservoir operations during time periods in which the Owners wish to reserve storage for anticipated dam releases or precipitation events. Under these conditions, the Owners would intend to keep groundwater out of the Reservoir.

The slurry wall will not eliminate flow of groundwater into the Reservoir when the Owners wish to keep it dry. Dewatering will still be required because the bottom of the Reservoir will be at a lower elevation than the surrounding groundwater, creating a hydraulic gradient toward the Reservoir. Therefore, some groundwater seepage into the Reservoir will occur under the slurry wall and is estimated at approximately 220 gpm when the Reservoir is being kept dry (Attachment D). This is the maximum estimated range of groundwater seepage into the Reservoir, which would occur at the end of the excavation and construction phases and is estimated to occur during the entire Reservoir operations phase when the Reservoir is kept empty. At the end of excavation and construction, the bottom of the Reservoir will be approximately 60 - 75 feet below ground surface,

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the maximum amount of pit wall will be exposed, and the maximum amount of groundwater head surrounding the Reservoir will be realized.

Reservoir operations do not involve storage of groundwater. Therefore, when dry Reservoir conditions are desired, seepage will be captured in a sump at a designated location within the Reservoir and will pumped back and reintroduced into the local aquifer via an infiltration trench located along the north side of the Reservoir, between the slurry wall and the adjacent CEMEX property. (Figure 12).

As stated above, groundwater in the Site vicinity generally flows toward the northwest (Schmidt, 2012). Based on this gradient, the Kaweah and St. Johns Rivers contribute to groundwater recharge for much of the time, and together with groundwater inflow from the east appear to be primary factors in driving the direction of groundwater flow.

After the slurry wall is installed, the general direction of groundwater flow is not expected to change since it is driven by recharge from the east and from the river channels. This northwest flow is expected to flow around the slurry wall to the north and south. This is not expected to significantly inhibit groundwater flow to areas west or north (downgradient) of the Site because the abundant coarse-grained soils of the alluvium and the fractured rock of the aquifer in the area is expected to accommodate flow around (to the north and south) and underneath the Site (Attachment A).

Groundwater is not expected to significantly mound (accumulate vertically) on the upgradient side of the Site or cause a “shadow” of depressed groundwater levels downgradient of the Site. Parcels located adjacent west of the Site will continue to receive recharge as groundwater flows around the slurry wall.

As stated above, seepage into the excavation will be collected and infiltrated back into to the aquifer, so the seepage will not constitute a loss and is not expected to affect groundwater supplies or levels.

The St. Johns and Kaweah Rivers create a significant hydraulic divide in the groundwater system. In general, any changes occurring on one side of a hydraulic divide are unlikely to affect conditions on the other side. Therefore, it is unlikely that potential groundwater related impacts, if any, would occur at sites located south of the St. Johns River or east of the Kaweah River. Because of the hydraulic divide and because the Project will not affect the fractured rock groundwater unit, groundwater levels in wells south of the Kaweah River such as the Lemon Cove municipal supply well are not expected to be affected by the Project.

The Reservoir, when pumped out, is not expected to impact the Minimum Threshold and Measurable Objective groundwater levels that have been established for Well KSB-2822 (also referred to as 18S27E05J001M), located between the St. Johns and Kaweah Rivers – Figure 9). The modeled changes to the groundwater levels around the outside of the slurry wall are provided in Attachment D which indicates these are insignificant, i.e., less than 3 to 3 feet.

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5.3.3. OPERATING RESERVOIR CONDITIONS

An estimated approximately 200 AF/yr. ((approximately 124 gpm as a continuous flow) of net evaporation will occur during a typical year of operation during which the Reservoir remains full or partially full, during the months of May through September and for short periods of days or weeks in the November through January period when used for flood control (se Section 4.5.2). This compares to the additional annual average 3,129 AF of additional agricultural water that would be made available by operating the Reservoir (Section 4.6.3). This evaporation rate amounts to 6% of the added water generated.

On a basin wide scale, the evaporation rate is minimal (less than 0.02%) compared to the 862,000 AF (699,000 AF of which is groundwater) delivered annually for irrigation purposes in the district (Fugro, 2007). Furthermore, since the Reservoir would be frequently emptied (likely 2 or more times per year) this would prevent any buildup of dissolved constituent that may be caused by evaporative concentration.

It is not anticipated that the reservoir will remain in a full condition for an entire year; however, if for some reason this were to occur, the annual evaporative loss is expected to be approximately 340 AF (Section 4.5.2).

During Reservoir operations, when the Reservoir is filled with diverted surface water, the water surface elevation will be up to approximately 460 feet elevation which exceeds the groundwater elevation at several locations within the Reservoir footprint. Although the slurry wall will have been installed to inhibit groundwater flux into and out of the Reservoir, aquifer recharge will occur under full Reservoir conditions because the Reservoir level will be higher than the surrounding groundwater. The recharge rate is expected to be minor due to the presence of the low-permeability slurry wall. The recharge volume depends on how much time the Reservoir water level remains above the groundwater levels in the vicinity. This recharge volume is not further evaluated because it is small and, in any event, constitutes a source of groundwater recharge no more than the recharge from the rivers.

5.3.4. CONSUMPTION WATER USE DURING EXCAVATION AND CONSTRUCTION

During excavation, the amount of water consumption will be relatively minor. As discussed in Section 4.1 it is estimated be approximately 141 AF/year.

Water for these purposes would be obtained from wells installed in the bottom of the excavation. These wells would also be used for maintaining the excavation in a dry enough state for the excavation and processing activities. These consumptive uses from the existing source constitute a minimal impact over baseline conditions. These consumptive uses are not expected to affect groundwater levels or supplies in the Site vicinity.

5.3.5. CONCLUSIONS

Negligible losses to groundwater are anticipated. The slurry wall will be in place, which will form a flow barrier in the alluvial groundwater system. As a result, in the Site area, groundwater flow

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directions will change as groundwater flows around the slurry wall through the alluvium and fractured rocks that surround the Site. Groundwater that seeps into the excavation through the slurry wall or through the bottom of the excavation will be collected and re-infiltrated back to the aquifer using infiltration drains. The infiltration gallery will be located north of the excavation, which will minimize changes to the current direction of groundwater flow in this area. Because recharge would not be significantly interrupted and offsite groundwater elevations are not expected to change noticeably, the excavation phase would therefore result in less than significant impacts under criterion “b” above.

Reservoir operations are expected to result in less impact to groundwater than the excavation and construction phases described above. The slurry wall will reduce impacts to groundwater supply by inhibiting groundwater from entering the Reservoir, where it would be subjected to evaporation. Seepage into the Reservoir through the slurry wall during dry-Reservoir periods will be returned to the aquifer. Reservoir operations impacts therefore are considered less than significant under criterion “b”.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.4. IMPACT HWQ3 (c): CHANGES TO SITE OR AREA DRAINAGE PATTERNS COULD RESULT IN EROSION OR SILTATION IMPACTS

This section describes an evaluation of the potential for drainage pattern changes to cause erosion or siltation impacts. Drainage system changes associated with the Project include installation and use of the Inlet and Outlet Channel. As described above, the Project involves creation of a topographic depression that will capture precipitation and some storm water runoff. However, there are no identifiable creeks or water bodies that will be disturbed by the Project. The Project will not involve placing structures in the St. Johns or Kaweah River channels. The only changes to the river channels will be placement of riprap at the Inflow and Outflow Channels, and construction of the Inflow and Outflow Channels. The riprap will be placed below the elevation of the surrounding channel, and the Inflow/Outflow Channels will be set back from the main river channels; these structures are designed to avoid impedance of river flows.

To evaluate scouring, SLR reviewed historical aerial photos. Previous aerial photos from the years 1954, 1956, 1969, 1974, 1984, 1989, and 1994 were reviewed to determine if major scouring or changes in morphology of the Kaweah and St. Johns Rivers have historically occurred near the Site. Based on review of these aerial photographs, no significant changes have occurred since the 1954 photograph. Terminus Dam, constructed in 1962, regulates flows and flooding and rapid changes in river morphology and scouring will therefore be minimized.

The potential for scouring to occur during delivery of water from Reservoir to the St. Johns and Kaweah Rivers will be minimized. The Outflow and Inflow Channels would include a riprap and concrete aprons, constructed across the riverbed of the Kaweah River (Figure 3). These aprons will prevent the potential scouring effects of the water being delivered to the rivers. In addition, the aprons will be installed so they do not protrude into the stream, so that they will not affect river flow rates or patterns.

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After a flood storage event in the Reservoir, water stored in the upper portion of the Reservoir would be released at flows ranging up to 900 cfs. The erosion protection measured installed in the Reservoir will prevent erosion in the outflow structure and the 900 cfs flow rate is significantly lower than the prior natural flood flows that have occurred in the rive channels and will not result in any changes to the natural erosion patterns in these.

To release water to the St. Johns River or the Kaweah River when the river water levels are higher than that of the Reservoir, a Floating Barge Pump (electrically powered) will pump water from the Reservoir into the Kaweah River, upstream of the McKay Point Structure. The Floating Barge Pump, or series of pumps, would have an approximate maximum flow rate of 160 cfs. Erosion control features will be constructed in the Floating Barge Pump discharge area so that the channel of the Kaweah River is not scoured.

In addition to review of aerial photos, SLR conducted sediment transport modeling using a computer application. The HEC-RAS computer application was utilized to evaluate the potential for sediment transport in the channels of the Kaweah River east of McKay Point, St. Johns River, and the Lower Kaweah River. The potential for sediment transport is dependent on the grain size distribution of channel materials, riverbed gradient, flow rate, and water flow regime. Further details regarding this evaluation are provided in Attachment C.

The sediment transport analysis was conducted based on the average maximum monthly flow of 1,500 cfs. This value consists of the highest average monthly flow rate measured between 2001 and 2007 documented in annual Watermaster reports (Watermaster, 2007). In other words, the flow rate used is considered the higher range of typical flow rates that occur in the Kaweah River in the Site vicinity.

Results of the HEC-RAS sediment transport analysis are presented in Attachment C. These results include profile views of the riverbeds, which illustrate a minimal potential for scour and transport at the flow rate applied.

Based on the results of the analyses the Project is not anticipated to alter the natural flow rates or conditions in the river. During Reservoir operations, flow rates in the St. Johns and Kaweah Rivers will remain within the existing range of typical flow rates that are currently managed through outflows of Terminus Dam. Use of the Reservoir for flood storage may cause flow rates in the Kaweah and St. Johns Rivers to decrease during periods of high precipitation, thereby actually reducing the scour potential.

Aerial photograph review and HEC-RAS sediment transport evaluation both suggest that, under typical conditions, there is insignificant potential for sediment transport in the river channels along the Site southern boundary. Terminus Dam is used extensively to manage flow rates in the rivers, and to avoid flow rates that would result in extensive scouring. The Project does not involve features or facilities that will change these conditions and may reduce flow rates during periods of extraordinary precipitation by providing flood storage. Based on these factors, siltation and erosion impacts associated with the Project are less than significant with respect to criterion “c” above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

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5.5. IMPACT HWQ5 (d): CHANGES TO ON-SITE DRAINAGE PATTERNS, INCLUDING ALTERING THE COURSE OF RIVERS, OR SUBSTANTIALLY INCREASE THE RATE OR AMOUNT OF SURFACE RUNOFF, RESULTING IN FLOODING IMPACTS

Reservoir excavation and construction would not alter the course of rivers. The Project would, however, change onsite drainage patterns because construction of a topographic depression will reduce the amount of storm water runoff flowing out of the Reservoir area. Releases from the Reservoir will not cause river flows to exceed their normal flow rate range and will not cause flooding. In fact, the Reservoir will be used for flood storage, which will decrease river flow rates during periods of extraordinary precipitation. Based on these factors, the Project would not increase the potential for flooding on- or off-site and therefore would not result in significant impacts under criterion “d” above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.6. IMPACT HWQ5 (e): CREATE OR CONTRIBUTE RUNOFF WATER WHICH WOULD EXCEED THE CAPACITY OF EXISTING OR PLANNED STORMWATER DRAINAGE SYSTEMS, CAUSE FLOODING ON- OR OFF - SITE, OR PROVIDE SUBSTANTIAL ADDITIONAL SOURCES OF POLLUTED RUNOFF

Since both during the excavation and Reservoir phases the Project would store any rainfall that falls within the Project area, there would be no increases in flood flows outside of the Project area so the capacity of existing or planned stormwater drainage systems would not be affected. Since stormwater in the Project area would also be collected with either the excavation or Reservoir, there would be no offsite sources of polluted runoff. Discharges from the Reservoir for agricultural purposes would be subject to appropriate water quality standards.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.7. IMPACT HWQ4 (g): PLACE HOUSING IN 100-YEAR FLOOD HAZARD AREA, OR STRUCTURES THAT WOULD IMPEDE OR REDIRECT FLOOD FLOWS

The Federal Emergency Management Agency (FEMA) flood map for the area including the Site indicates that the eastern portion of the proposed Reservoir is located within the 100-Year Flood Hazard Zone (Figure 9). FEMA has established base flood elevations for the St. Johns and Lower Kaweah Rivers downstream of McKay Point, but not for the Kaweah River upstream of McKay Point and the portion of the proposed Reservoir within the 100-year Flood Hazard Zone. This

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situation is common because FEMA tends to apply its resources to conducting detailed flood mapping in populated areas (such as near the City of Visalia) rather than rural areas.

FEMA's work on the eastern portion of the Site was not conducted in sufficient detail to establish base flood elevations, and it follows that the accuracy of the flood hazard zone presented by FEMA could be improved if flood mapping in greater detail was conducted. Therefore, SLR conducted flood modeling for this area in greater detail to establish base flood elevations, and to delineate the 100-year flood inundation area.

The HEC-RAS hydraulic software package, released by the United States Army Corps of Engineers, was used to simulate the 100-year flood flow at the Kaweah River east of McKay Point. The flow is based upon the raised spillway at the Terminus dam. The peak flow at McKay Point is 18,220 cfs, as calculated by the United States Army Corps of Engineers. Details regarding this flood modeling are included in Attachment C.

The topographic data used for flood modeling consisted of the LiDAR survey conducted for the Tulare and Visalia basin in 2004. These topographic data were part of the same dataset used by FEMA for the flood mapping conducted downstream of McKay Point as documented in FEMA (2009). A total of 12 cross sections, spaced at a maximum of 1,000 feet apart, were created along the length of 7,600 feet east of the McKay Point junction of the Kaweah River. For purposes of model stability, cross sections were interpolated throughout the reach with sections positions at distances no larger than 75 feet apart.

SLR conducted a steady state flow analysis to calculate the based flood elevations for the peak flow of the 100-year flood for the Kaweah River east of McKay Point. The analysis was calibrated to tie into the water surface elevations calculated in the prior analyses conducted by FEMA for stretches of the St. Johns and Kaweah Rivers downstream of McKay Point.

Figure 11 presents the water surface elevations and floodway for the 100-year flood peak flow. Based on SLR's detailed flood modeling evaluation, the floodway for the 100-year flood peak flow will only encroach minimally on the proposed Reservoir footprint. Although the eastern end of proposed Reservoir footprint is in the areas subject to inundation as sated by FEMA, no significant quantities of water will be present in these areas. Therefore, since the Project is not expected to place structures in the 100-year flood hazard zone and is not expected to redirect flood flows this potential impact is considered less than significant under criterion "g".

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.8. MPACT HWQ6 (h): POTENTIAL IMPACTS OF LEVEE OR DAM FAILURE

This section considers both a levee and dam failure from a facility in the vicinity of the Project, as well as a potential failure of the Project facilities.

Levee or dam failure from a facility in the vicinity of the Project

The Terminus Dam is considered a High Hazard dam where failure or mis-operation could cause loss of human life. It has an Emergency Action Plan (EAP) which describes actions to be taken

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to reduce the potential for property damage and loss of life in an area affected by the dam failure of the dam (https://nid.sec.usace.army.mil/#/dams/system/549835/summary). The EAP was last revised on September 19, 2016 and exercised (tested) on October 21, 2020.

A hypothetical failure of the Terminus Dam located upstream of the Project, likely by a dam breach, would result in a flood of released water. In the event of such a failure, the Project would not alter the extent of downstream flooding since it provides no impediment to the dam breach flood wave. Since some of the flood wave would be stored in the reservoir, the Project may slightly reduce the downstream flooding.

Workers at the Project during both the excavation and Reservoir phases would likely be exposed to flooding from a Terminus Dam failure and would need to be made aware of the EAP and be trained to comply with its requirements.

Based on the discussion above, risk associated with the unlikely scenario of a Terminus Dam failure will be minimized by the EAP. Thus, the Project would not result in significant impacts under criterion “h" above.

Potential failure of the Project facilities

The Project involves construction of a perimeter berm that may be as much as approximately 8 feet above surrounding topography in some areas. However, as described in Section 4.7, the Project only includes the placement of a berm at the edge of the predicted area to be inundated by the 100-year flood. In addition, the Project does not involve construction of housing or work areas that will be occupied on a regular basis. As described above, most of the Reservoir operations will be conducted remotely. Construction operations will also be conducted outside of the 100-year flood inundation area. Therefore, the Project is not expected to be affected by a 100-year flood.

The water elevation in the Reservoir may extend above the current natural surface elevation. Water will be withheld in some areas of the Reservoir by a berm that contains a slurry wall. The berm will be designed and constructed, to an appropriate factor of safety, to withhold the hydraulic forces necessary to store surface waters at the desired elevation. Regular inspections of the Reservoir structures and facilities, including the berm, will be conducted. Failures of berms such as the one proposed typically display early signs of an impending failure, such as slumping, appearance of seepage, or settlement, so that corrective actions will be taken by the Owners as appropriate to avoid the failure.

Even if failure occurs, the entire Reservoir volume would not flow out. A maximum of up to approximately 1,000 AF could drain from the Reservoir without pumping, compared to the total Reservoir volume of approximately 4,600 AF. In that unlikely case, the Owners would have multiple response options. The Reservoir level could be quickly lowered in a controlled fashion using the Inlet and/or Outlet Channels. Also, the McKay Point structure immediately downstream could be used to limit the extent to which river levels are raised. Similarly, the additional flow could be accommodated by multiple downstream watercourses, including the Lower Kaweah, St. Johns, and the multiple related irrigation ditches.

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Based on the discussion above, the Project is not expected to cause significant loss, injury, or death by dam or dike failure. Thus, the Project would not result in significant impacts under criterion “h" above.

Conclusion

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.9. IMPACT HWQ7(i): POTENTIAL IMPACTS FROM SEICHE, TSUNAMI, OR MUDFLOW

The Project is not near the coast, so it is not susceptible to inundation by a tsunami. In addition, the Project is surrounded by relatively flat topography, and calculations conducted by SLR suggest that proposed Reservoir slopes are within acceptable factors of safety. Therefore, the Site is not expected to be affected by a mudflow.

A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes. The wave can reduce water levels at one end of the water body and increase the water level on the other, like the “sloshing” of water back and forth.

The potential for seismic ground shaking to generate a seiche in the proposed Reservoir was evaluated. The risk associated with a seiche is overtopping of the Reservoir if the amplitude of the wave exceeds the freeboard included in the design by an amount large enough to generate a force that could be detrimental to the facility.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the Reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave.

The natural period of the Reservoir can be calculated using the Merian formula assuming a rectangular basin (USNRC, 2011).

$$\mathrm{T} = \frac{2\,L}{\sqrt{gh}}$$

Where L is the length of the basin, g the acceleration of gravity (32.2 cm/sec^2), and h the depth of water. Combining a representative value of 600 ft as the average width of the basin and a depth of water h of 70 ft, the natural period of the Reservoir is estimated to be:

$$T = \frac{(2)(600)}{\sqrt{(32.2)(70)}} = 25\ s$$

This natural period is to be compared to that of the earthquake that may shake the Site. The typical range of period for strong ground motion is between 0 and 5.0 seconds, with the dominant period for the site-specific event being on the order of 0.2 second (USGS, http://geohazards.usgs.gov/hazardtool/application.php). Therefore, the difference in period between the Reservoir and the design earthquake is two orders of magnitude.

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An empirical formula is provided in HAZUS (FEMA, 2003) to estimate the peak wave height of the seiche as:

$$H = \sqrt{\frac{A}{L\,(\pi f)^2}}$$

Where H is the peak height, A is the acceleration (in g's), f is the frequency of the lake, and L is the wavelength (5.12/ft^2). Using the PGA calculated for the 2,475-year event of 0.20 g, the maximum wave height of a seiche is estimated to be 0.06 cm.

The estimated value of the peak wave for the seiche at the Site is extremely low and for practical purposes, insignificant. In addition, the ratio between the Reservoir and the natural period of the seismic event that could occur on Site is on the order of 125:1 (25/0.2), which indicates a possible resonance condition is unlikely.

Given the size of the Reservoir and the anticipated earthquake dominant period, resonance will not occur at the Site between the Reservoir and ground shaking, therefore the risk of a damaging seiche is insignificant and any seismic generated wave will be controlled by the design freeboard. Thus, the Project would not result in significant impacts under criterion "i" above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

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6. CONCLUSIONS

As described in previous sections, SLR has conducted a review of baseline and Project related conditions and has evaluated potential Project related impacts relating to Hydrology and Water Quality based on CEQA Appendix G criteria. Based on our evaluation, we have identified no significant impacts.

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7. REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2008. Alaska Administrative Code (18 AAC 75), Oil and Other Hazardous Substances Pollution Control, as amended through October 9.

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

FEMA, 2009, Flood Insurance Study, Tulare County and Incorporated Areas.

FERC, 2012 "Notice of Preliminary Permit Application file by Kaweah River Power Authority, Federal Energy Regulatory Commission Document 2012-21178, Filed August 27, 2012.

Fugro, 2007, Water Resources Investigation of the Kaweah Delta Conservation District.

GEI/GSI, 2020, Kaweah Subbasin – Basin Setting Components, GEI Consultants and GSI Water Solutions, January 10, 2020.

GKGSA, 2020, Groundwater Sustainability Plan, Greater Kaweah Groundwater Sustainability Agency, January 22, 2020.

Irrigation Training and Research Center, undated, http://www.itrc.org/databases/cecaplrp/CEC%20APLRP%20Case%20Study%20TID.pdf. retrieved August 22, 2014.

Luhdorff and Scalmanini, 1995, Impact Analysis, Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California.

Luhdorff and Scalmanini, 2004, Assessment of Hydrology and Water Quality, Kaweah South Mining Project.

Schmidt, 2012, *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project.*

SLR, 2021, McKay Point Reservoir Project – Geology and Soils Technical Study, December 2021.

Tulare Irrigation District, 2011, Groundwater Elevation Monitoring, December 2011.

University of California Irvine (UCI), 2018, AghaKouchak, Amir, Elisa Ragno, Charlotte Love, and Hamed Moftakhari. *Projected changes in California's precipitation intensity-duration-frequency curves.* California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CCCA4-CEC-2018-005.

US Army Corps of Engineers, 1990, Kaweah River Basin, California.

US Army Corps of Engineers, 2005, Water Control Manual, Terminus Dam and Lake Kaweah, Drought Contingency Plan for Terminus Dam and Lake Kaweah.

DRAFT

Kaweah and St. Johns Rivers Association (Watermaster), 1933-2020, Annual Reports.

Western Regional Climate Center, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4890, downloaded September 19, 2014.

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LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations after the performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. When performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the Site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the Site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall Site environmental conditions.

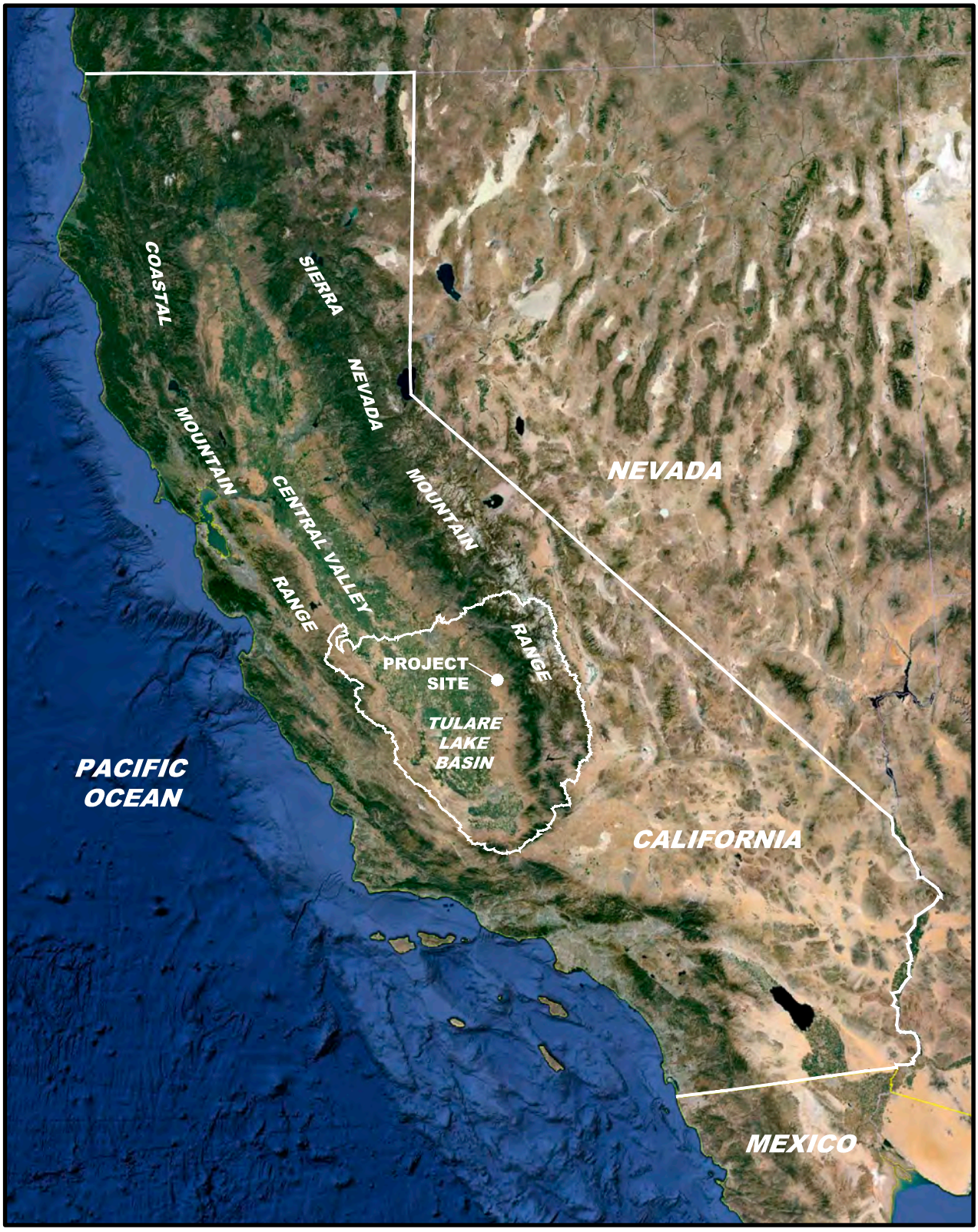
The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the Site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws, rules, regulations, or policies of federal, state, or local governmental agencies.

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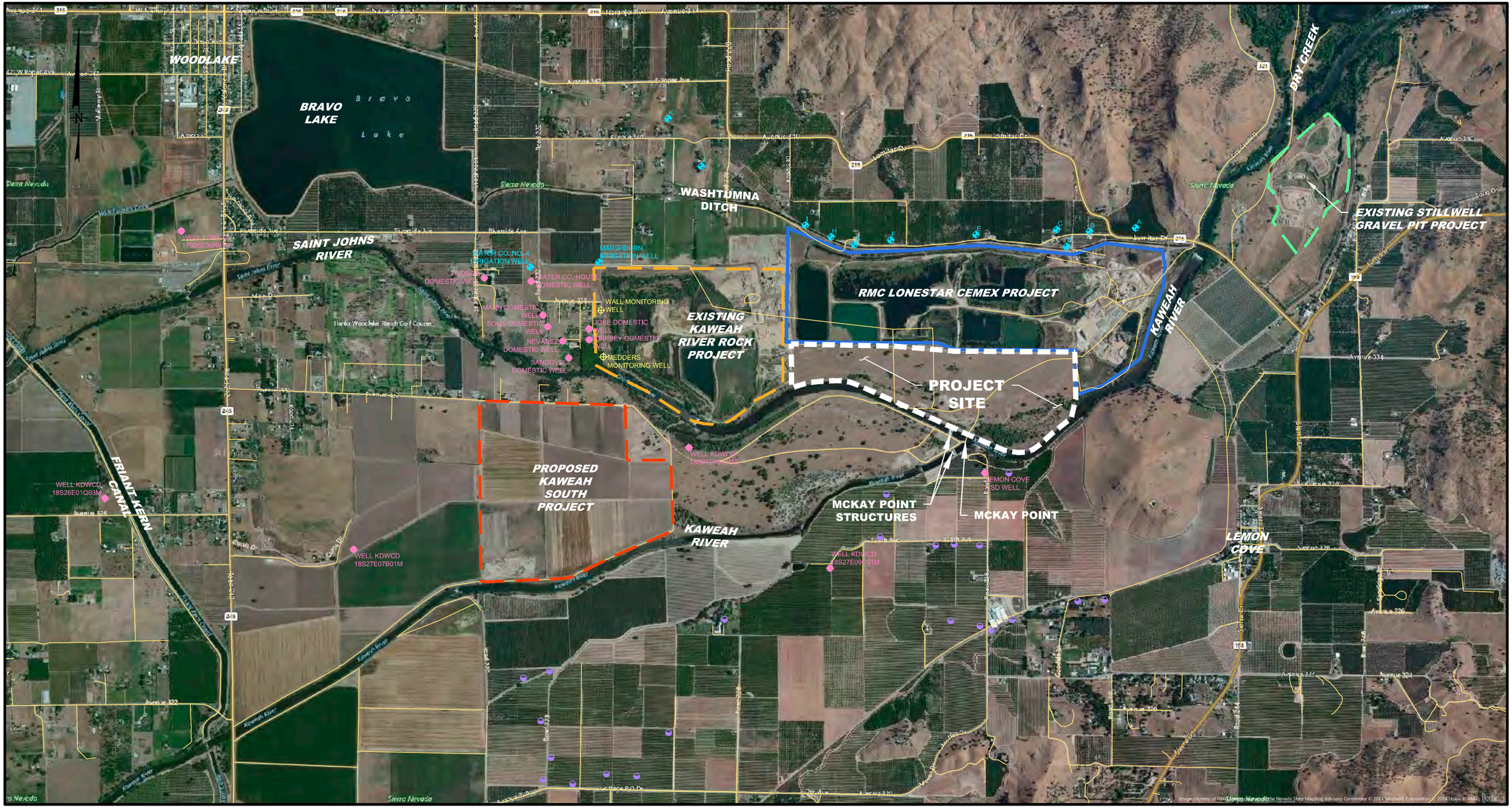
FIGURES

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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **SITE LOCATION MAP**	DRAWING No. **1** REV A

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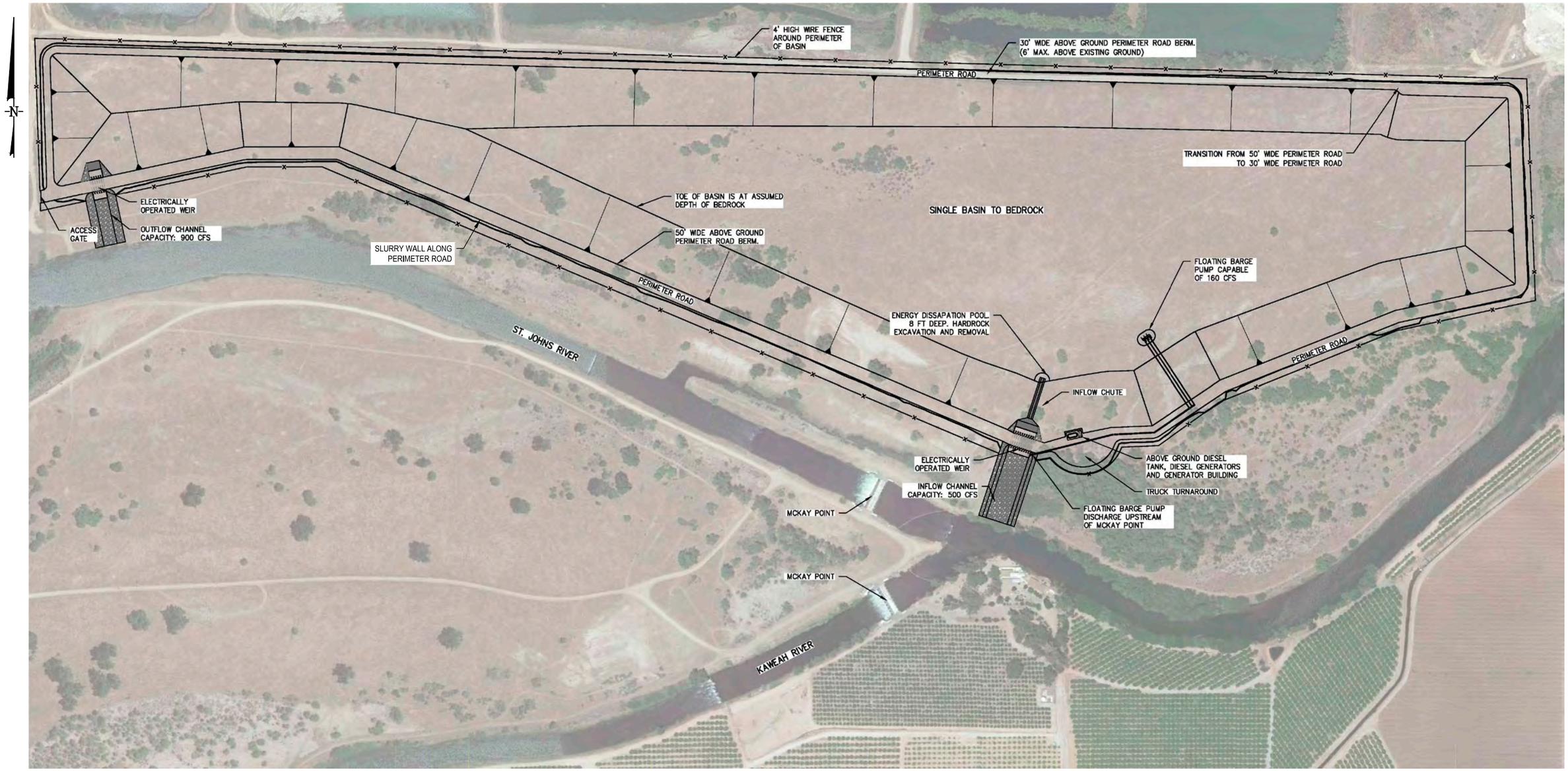
LEGEND

- EXISTING ROADS
- IRRIGATION WELL LOCATIONS
- DOMESTIC WELL LOCATIONS
- MONITORING WELL LOCATIONS
- SUPPLY WELL LOCATIONS

2000 0 4000 FT

REPORT: ---	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: 2/28/21	
PROVIDED BY: SLR INTERNATIONAL CORPORATION, *Consulting Engineers & Scientists*, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00005	
	TITLE: **SITE VICINITY MAP**	FIGURE No.: **2**	REV: B

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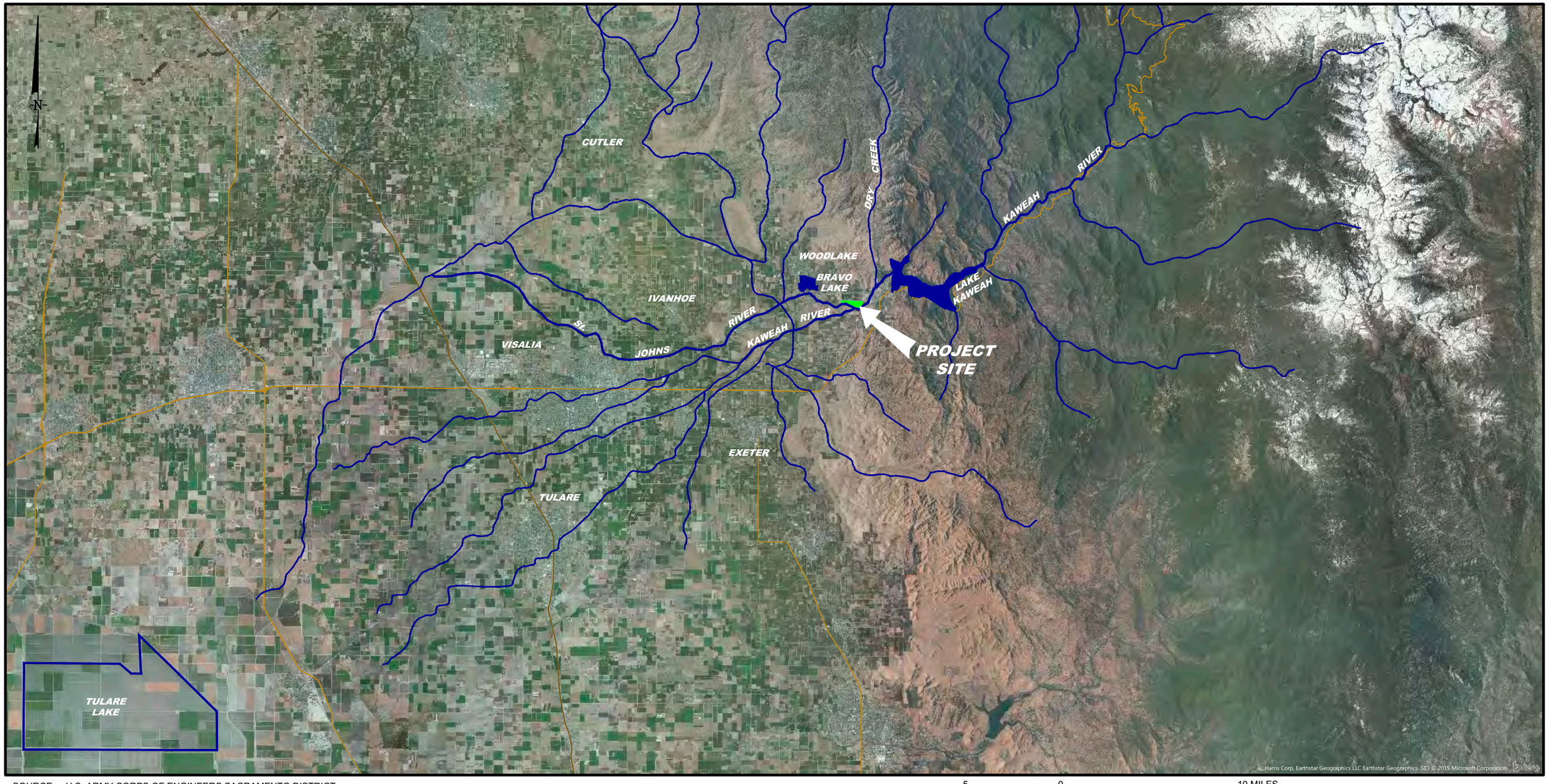


SOURCE: PROVOST & PRITCHARD, 2/18/14
FIGURE 1 - PROPOSED SITE MAP

NOT TO SCALE

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	TITLE **MCKAY POINT RESERVOIR CONCEPTUAL ILLUSTRATION**	FIGURE No. **3** REV A

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SOURCE: U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT
HYDROLOGY OFFICE REPORT KAWEAH RIVER BASIN, CALIFORNIA, AUGUST 1990
CHART 1 - GENERAL MAP

5 0 10 MILES

LEGEND

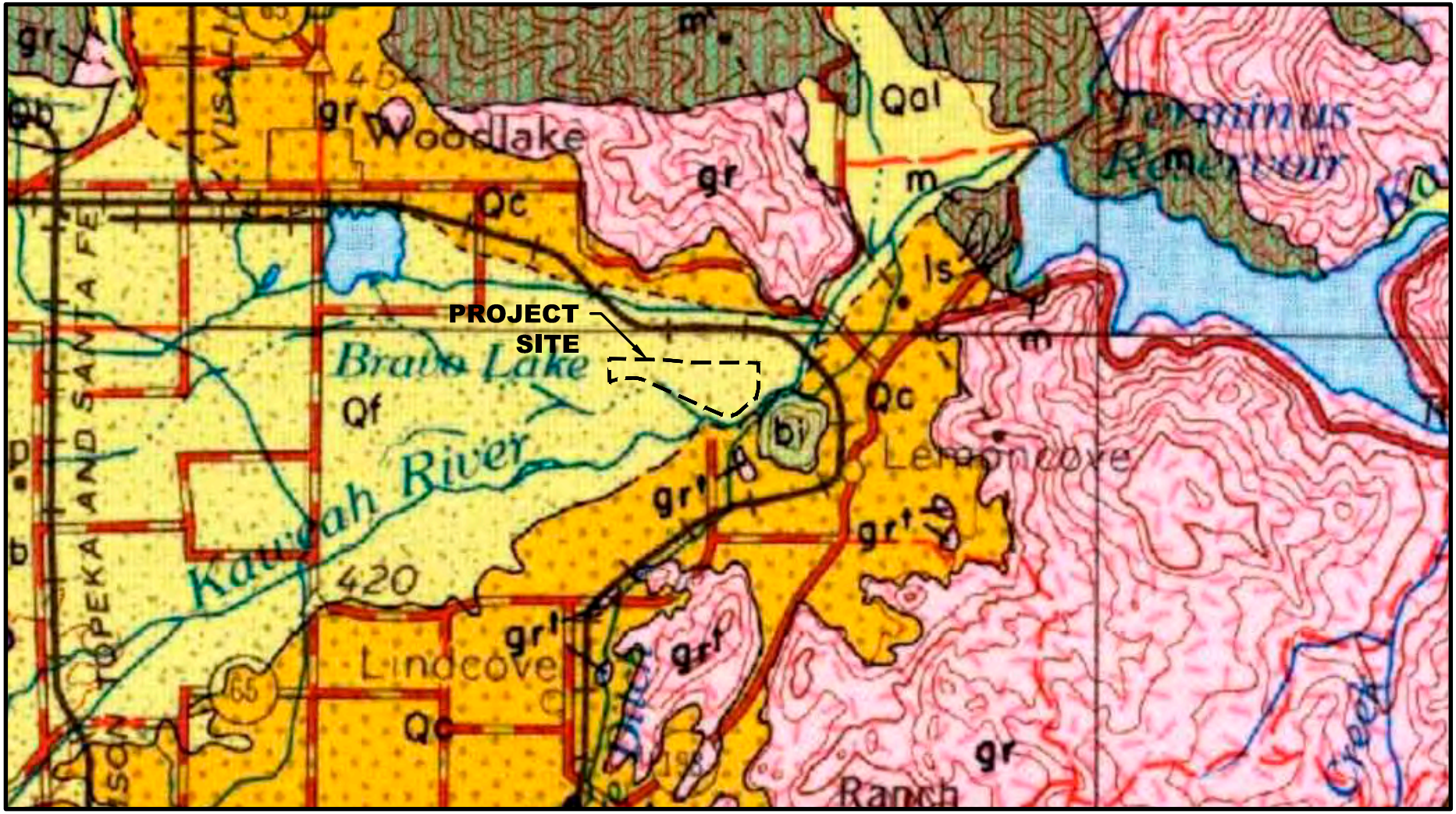
SURFACE WATER BODIES

NOTES

SURFACE WATER BODIES ARE APPROXIMATE

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PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00005
	TITLE: **SURFACE WATER BODIES IN SITE VICINITY**	FIGURE No.: **4** / REV: A

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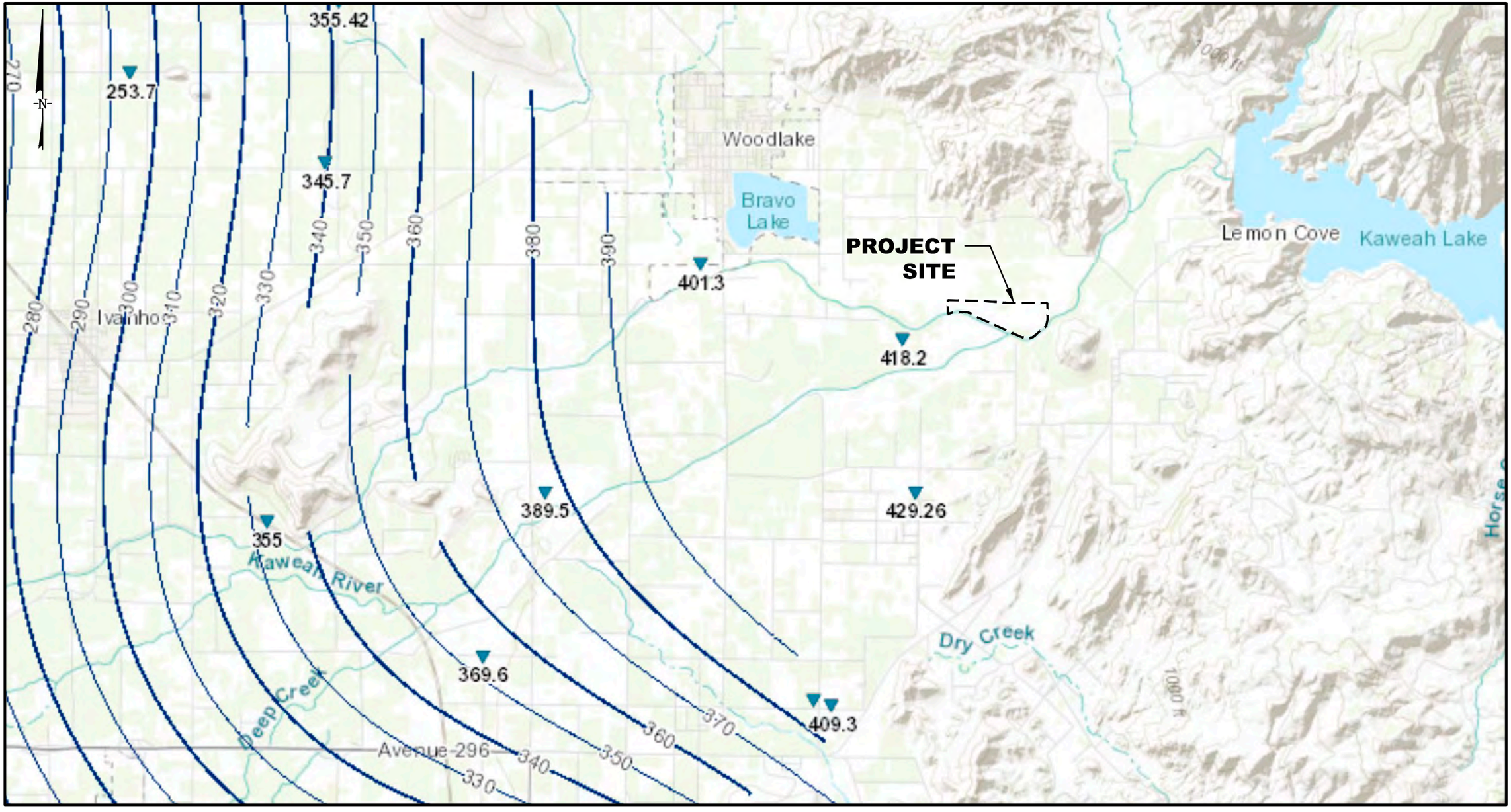
Qal	- ALLUVIUM
Qf	- FAN DEPOSITS
Qc	- PLEISTOCENE NONMARINE
gr	- MESOZOIC GRANITIC ROCKS
ub	- MESOZOIC ULTRAMAFIC INTRUSIVE ROCKS
m(ls)	- PRE-CRETACEOUS METAMORPHIC ROCKS (ls = LIMESTONE OR DOLOMITE)
ms	- PRE-CRETACEOUS METASEDIMENTARY ROCKS
mv	- PRE-CRETACEOUS METAVOLCANIC ROCKS

SOURCE: GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET, CALIFORNIA GEOLOGICAL SURVEY, 1:250,000 SCALE

0 6000 FT

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PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: MCKAY POINT RESERVOIR PROJECT	PROJECT No.: 117.02125.00005
	TITLE: GEOLOGIC MAP	FIGURE No.: 5 / REV: A

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SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES
GROUNDWATER INFORMATION CENTER, SPRING 2020

0 1 2 Mi

LEGEND

GROUNDWATER LEVEL ELEVATION (FT - MSL)

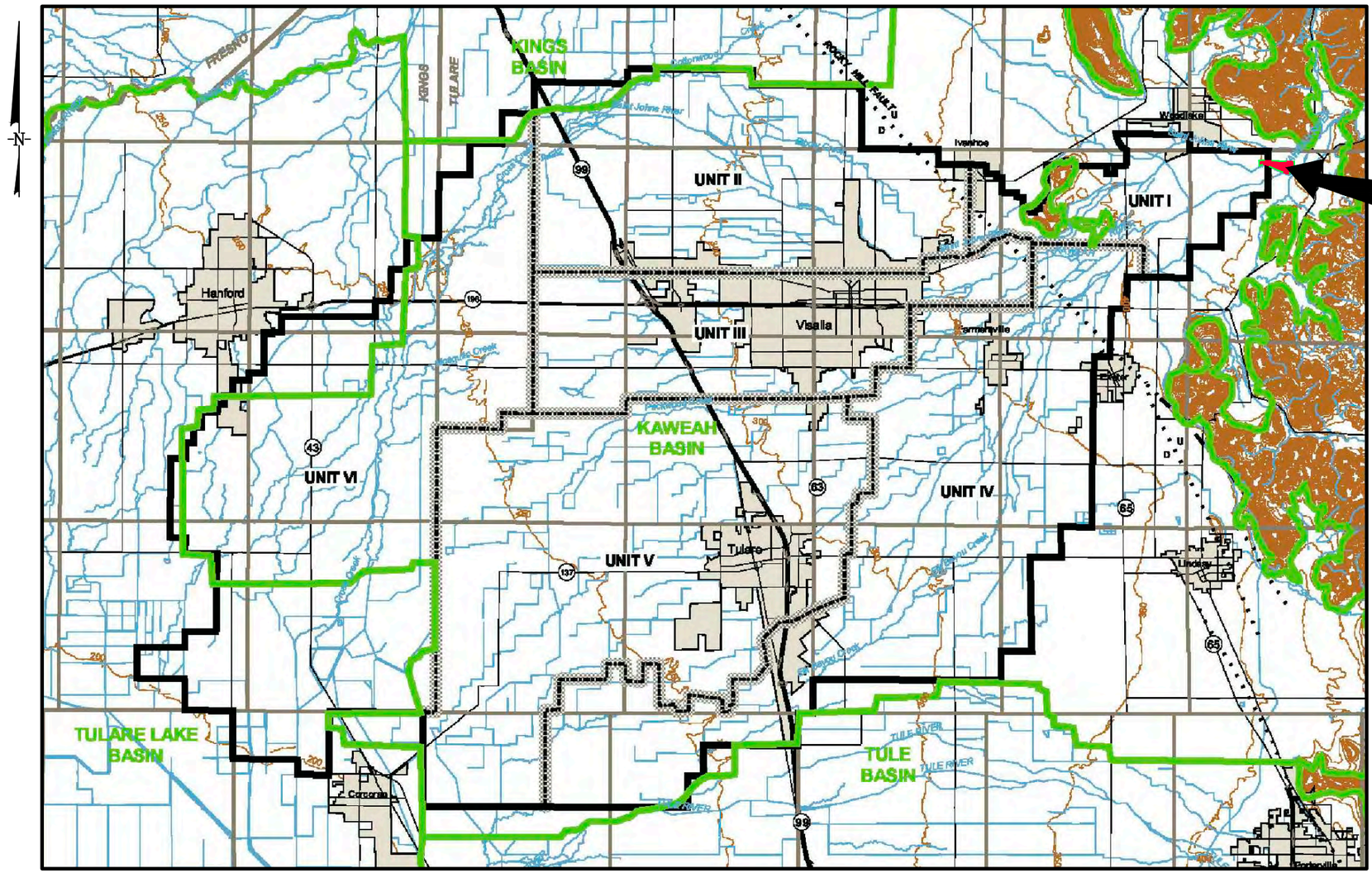
WELL LOCATIONS

NOTES

GROUNDWATER LEVEL CONTOURS ARE APPROXIMATE

REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005	
	TITLE **REGIONAL GROUNDWATER LEVEL COUNTOURS**	FIGURE No. **6**	REV A

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SOURCE: FURGO WEST, INC., JULY 2007
WATER RESOURCES INVESTIGATION OF THE KAWEAH DELTA WATER CONSERVATION DISTRICT FINAL REPORT
PLATE 2 - STUDY AREA MAP

LEGEND

- Groundwater Basins
- Fault–dashed where inferred, dotted where concealed; U, upthrown side; D, downthrown side
- District Boundary
- Hydrologic Unit Boundary
- County Line
- Township and Range Lines
- Streams
- Urban Areas

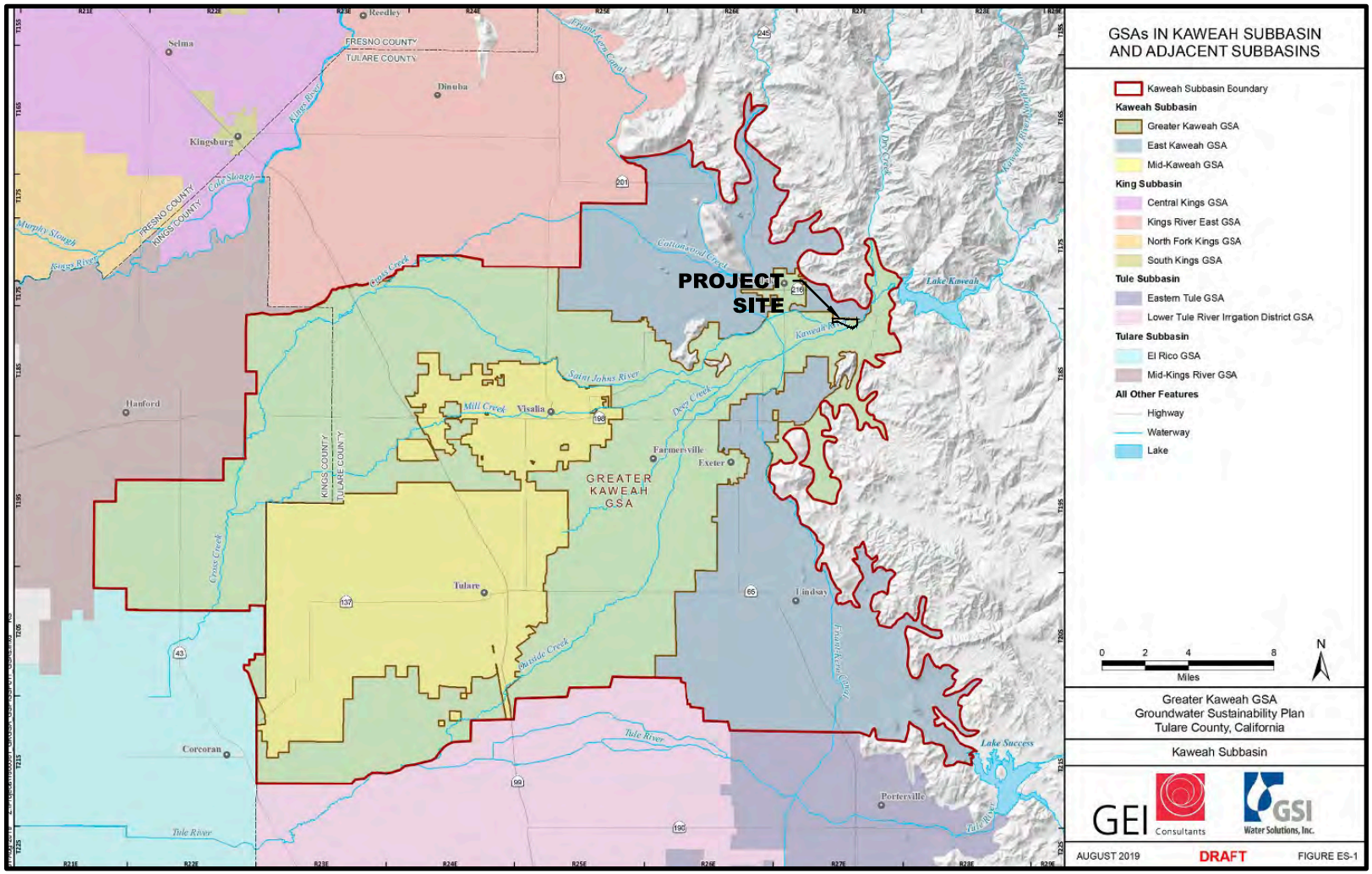
Projection: California State Plane, Zone 4, NAD83, Feet

NOTES

BOUNDARIES ARE APPROXIMATE

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	TITLE: **KAWEAH DELTA WATER CONSERVATION DISTRICT BOUNDARY**	FIGURE No.: **7** / REV: A

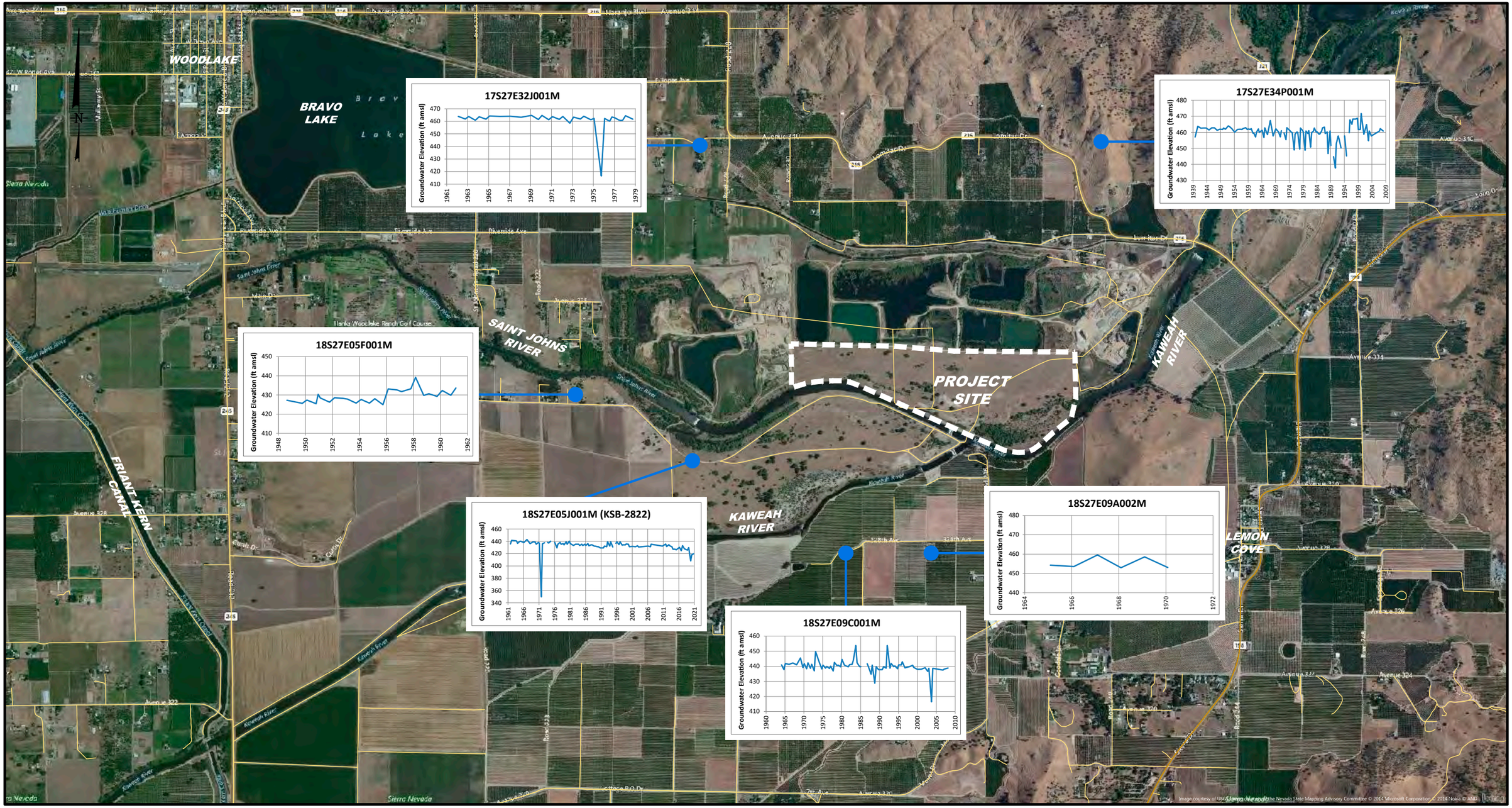
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SOURCE: GREATER KAWEAH GROUNDWATER SUSTAINABILITY AGENCY, JANUARY 22, 2020

REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **GREATER KAWEAH GROUNDWATER SUSTAINABILITY AREA**	FIGURE No. **8** REV A

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SOURCE: GROUNDWATER DATA FROM THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

2000 0 4000 FT

LEGEND

GROUNDWATER WELL LOCATION

NOTES

GROUNDWATER WELL LOCATIONS ARE APPROXIMATE

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	TITLE: SELECT GROUNDWATER HYDROGRAPHS IN SITE VICINITY	FIGURE No.: 9 / REV: A

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SOURCE: GROUNDWATER CONTOURS FROM KENNETH D. SCHMIDT AND ASSOCIATES FIGURE 6 - WATER LEVEL ELEVATIONS AND DIRECTION OF GROUNDWATER FLOW (NOVEMBER-DECEMBER, 2011)

1000 0 2000 FT

LEGEND

GROUNDWATER LEVEL ELEVATION (FT - MSL)

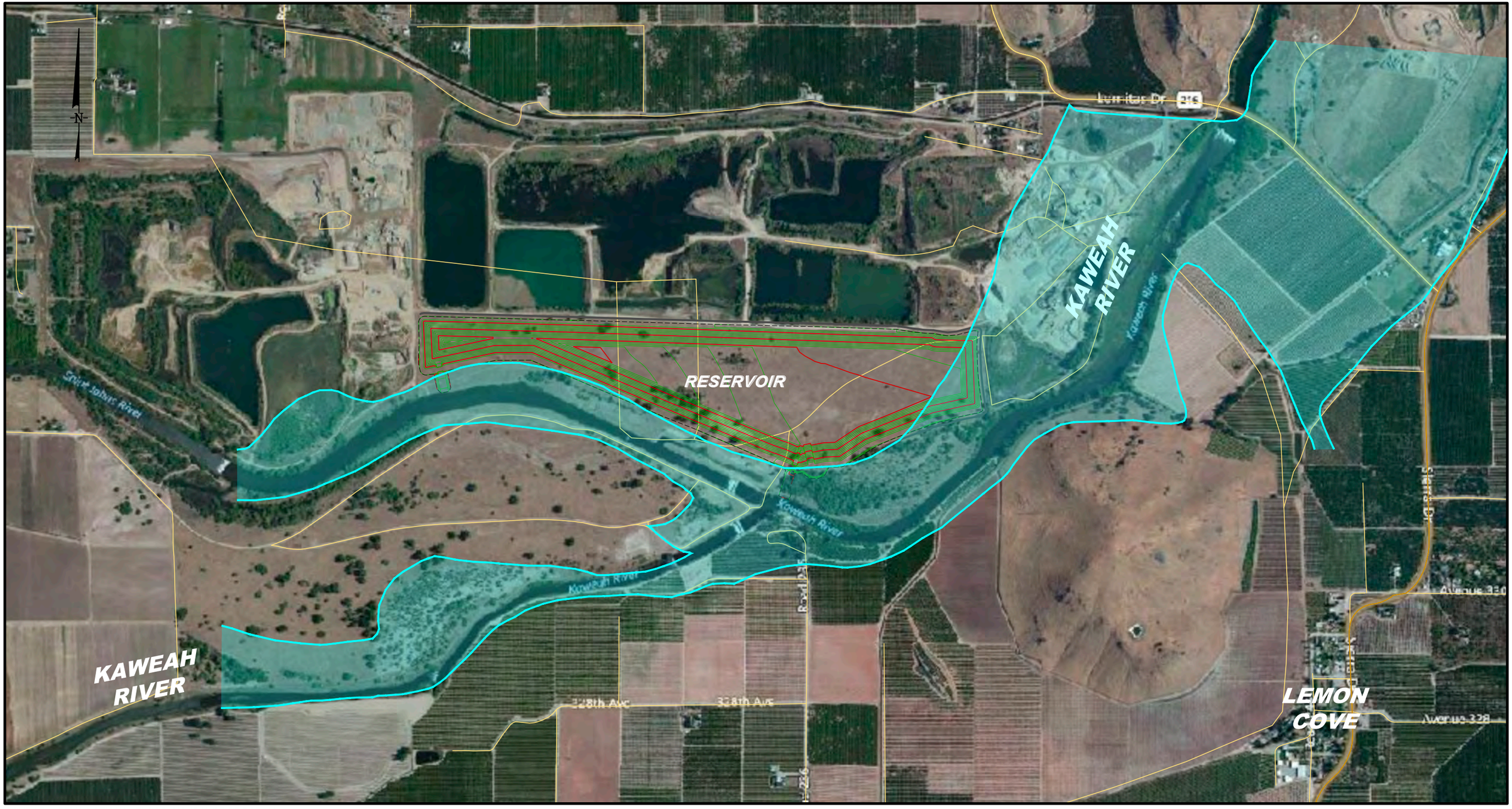
443 GROUNDWATER SPOT ELEVATION (FT - MSL)

NOTES

GROUNDWATER LEVEL CONTOURS ARE APPROXIMATE

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	TITLE: GROUNDWATER LEVELS IN THE VICINITY	FIGURE No.: 10 / REV: A

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SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

1000 0 2000 FT

LEGEND

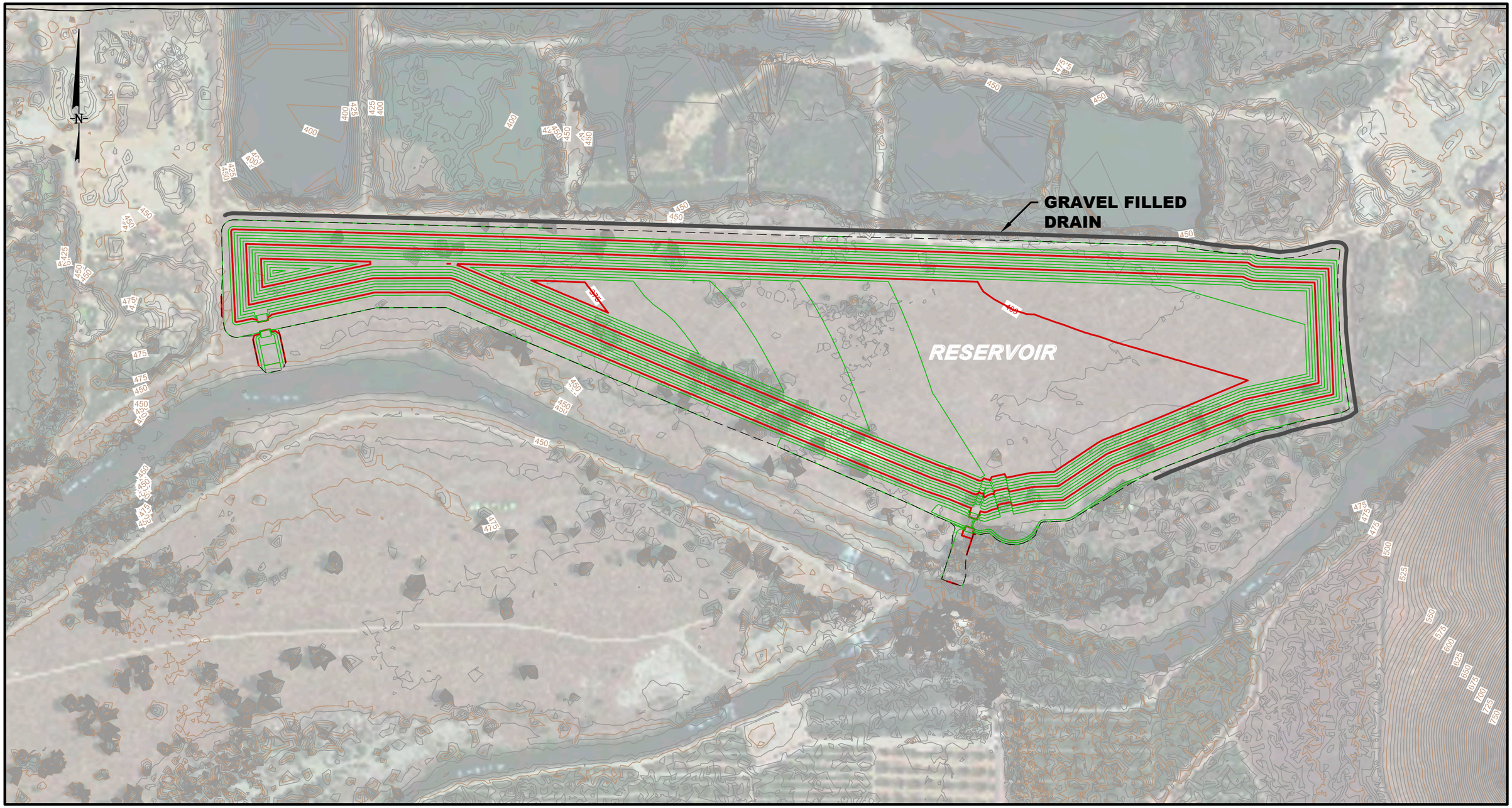
SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1□ ANNUAL CHANCE FLOOD (100-YEAR FLOOD)

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS ARE APPROXIMATE

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	TITLE **FEMA FLOOD HAZARD ZONE**	FIGURE No. **11** / REV A

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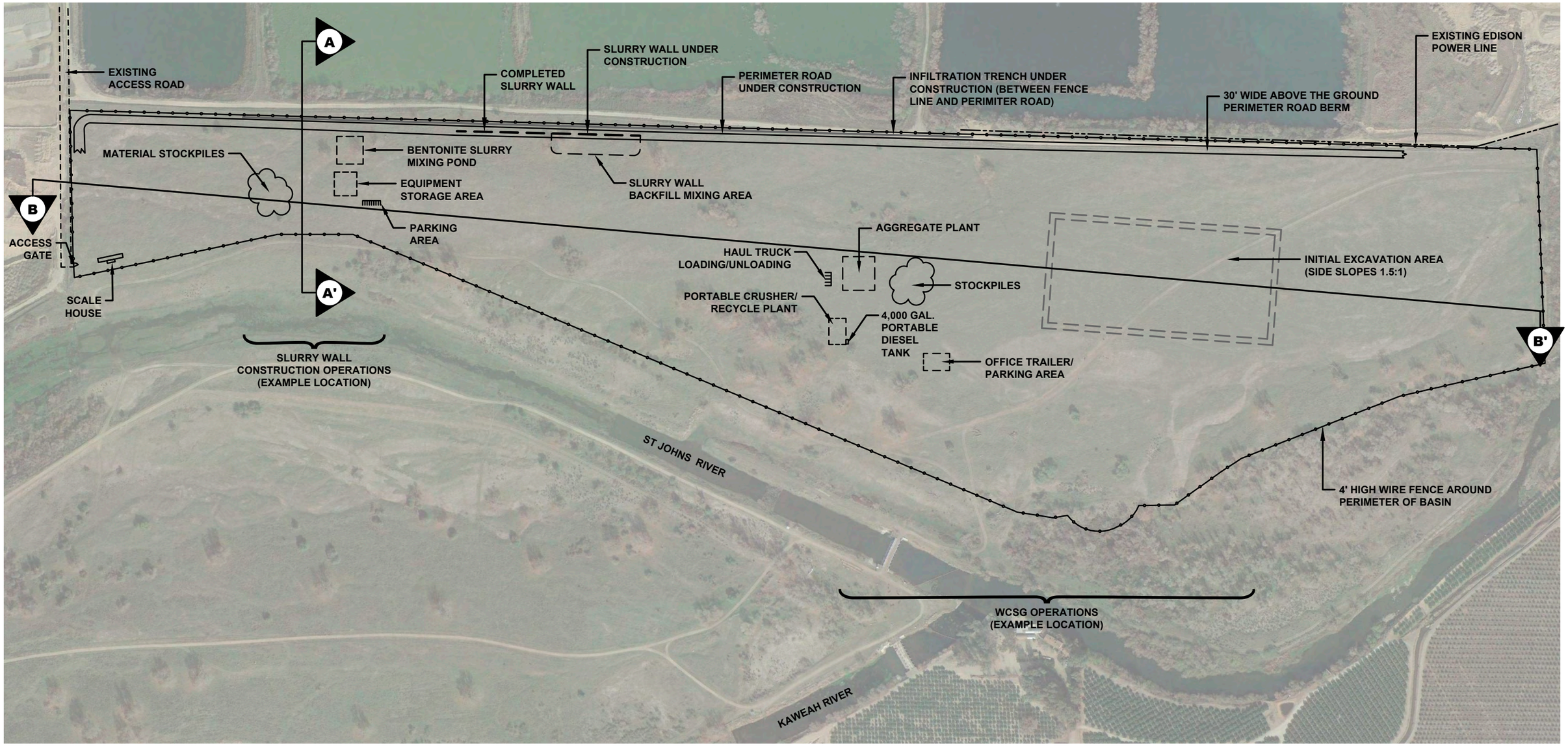
300 0 600 FT

LEGEND

- 100 — EXISTING GROUND SURFACE CONTOUR EL, FEET
- 100 — PROPOSED GROUND SURFACE CONTOUR EL, FEET
- RESERVOIR BOUNDARY

REPORT: ----	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: 2/28/21	
PROVIDED BY: SLR INTERNATIONAL CORPORATION, *Consulting Engineers & Scientists*, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00005	
	TITLE: **EXISTING AND PROPOSED TOPOGRAPHY**	FIGURE No.: **12**	REV: A

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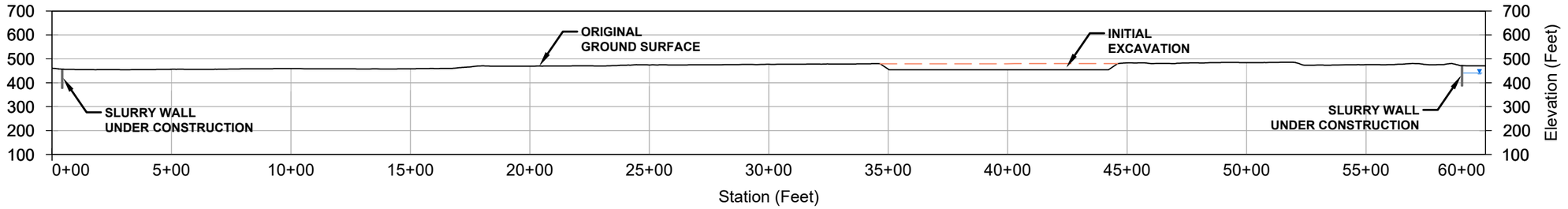
400 FT 0 800 FT

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	TITLE **INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION**	FIGURE No. **13** REV.

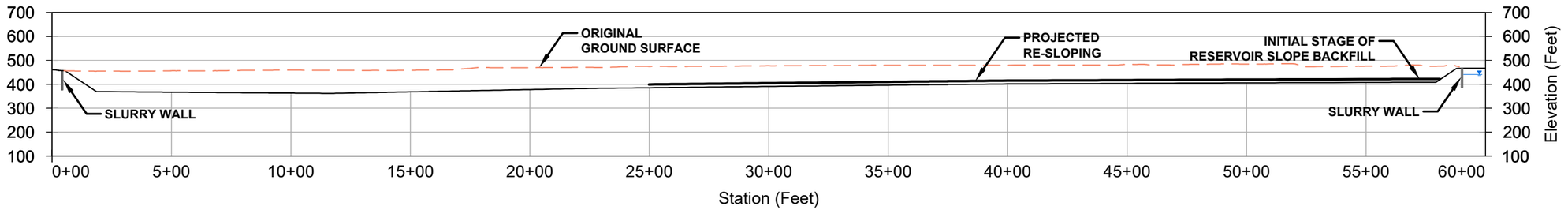
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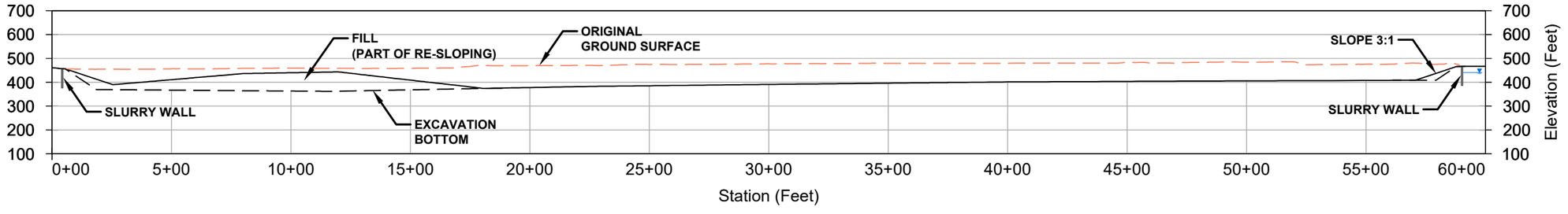
INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION



FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL



COMPLETED RESERVOIR

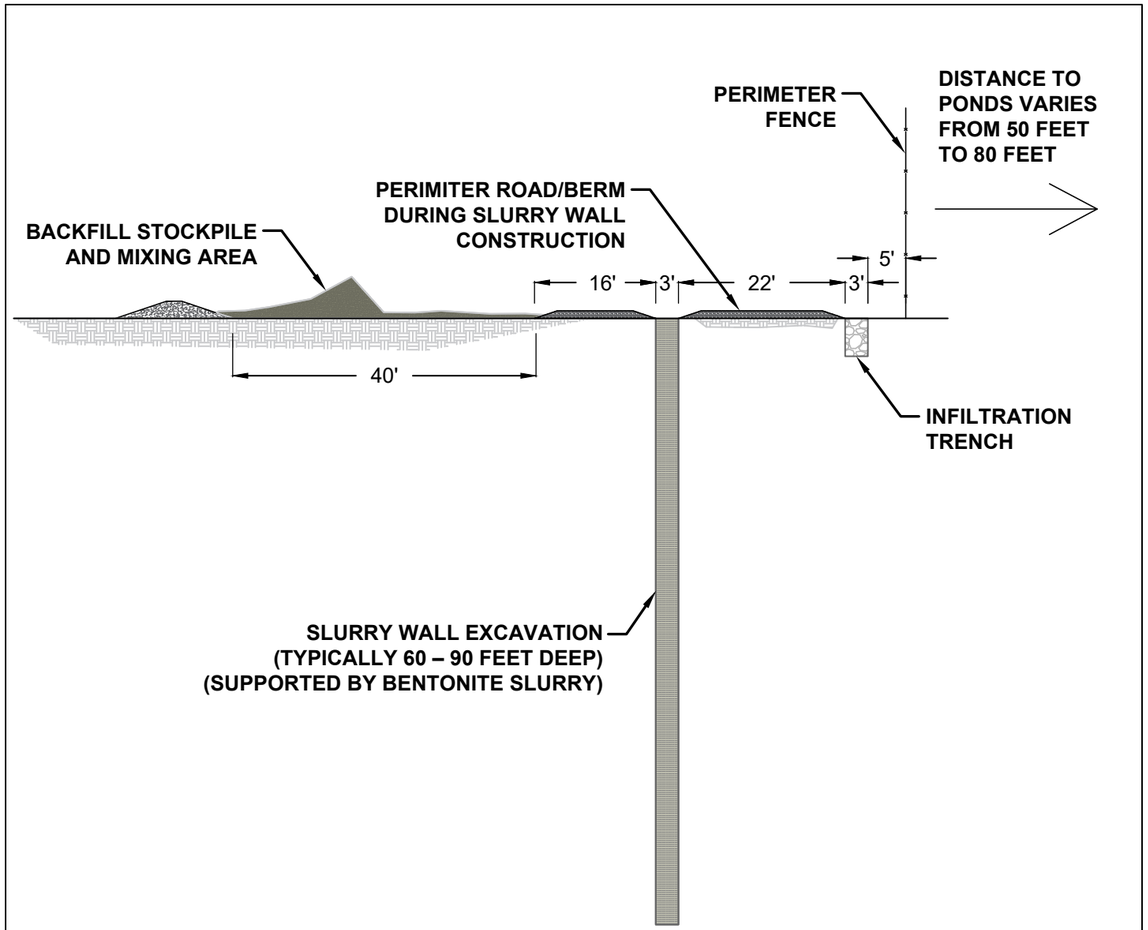


500 FT 0 1,000 FT

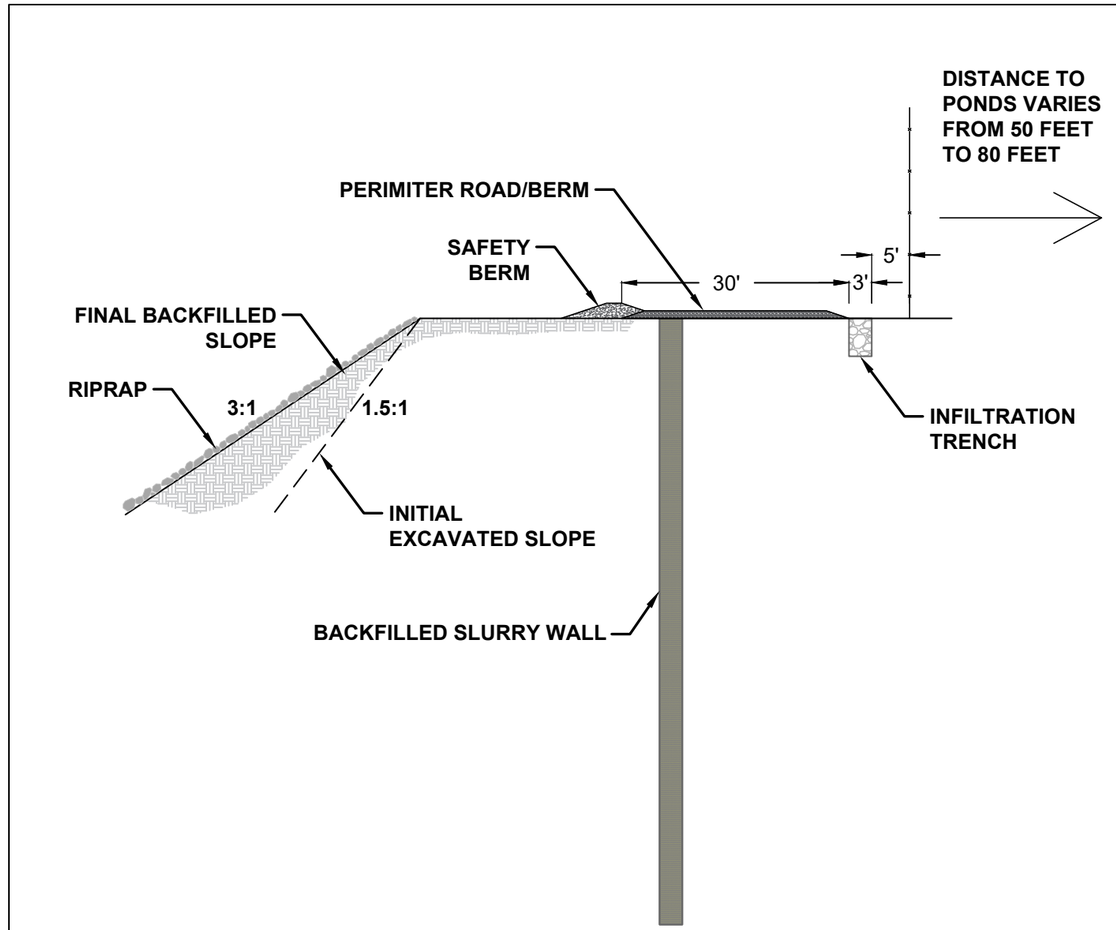
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	TITLE **PROFILE B–B'**	FIGURE No. **14** / REV.

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CROSS SECTION A-A'
DURING CONSTRUCTION OF SLURRY WALL



CROSS SECTION A-A'
COMPLETED RESERVOIR

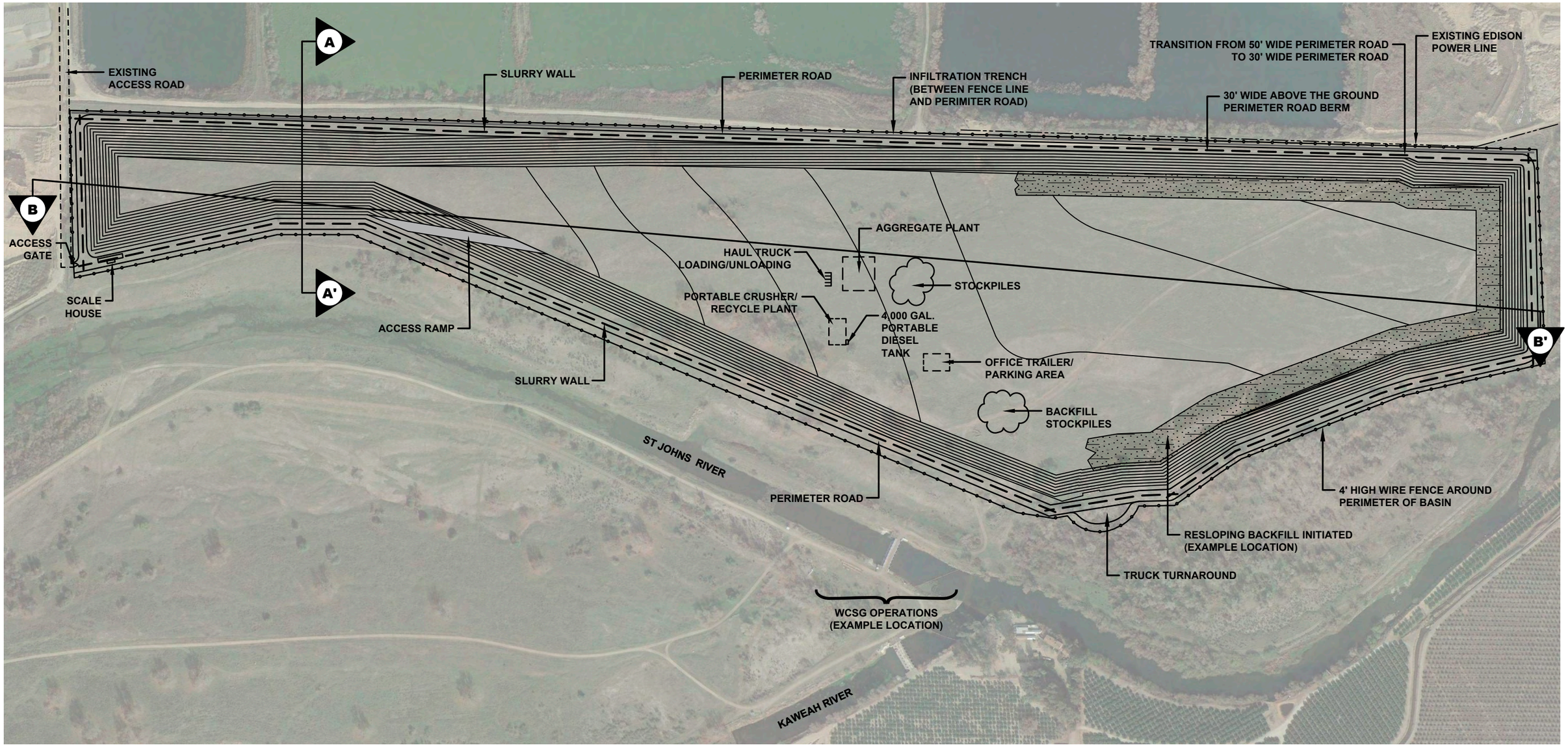
NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE
AND FOR ILLUSTRATION PURPOSES ONLY

20 FT 0 40 FT

REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE AUGUST, 2021
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	TITLE **PROFILE A–A'**	FIGURE No. **15** / REV.

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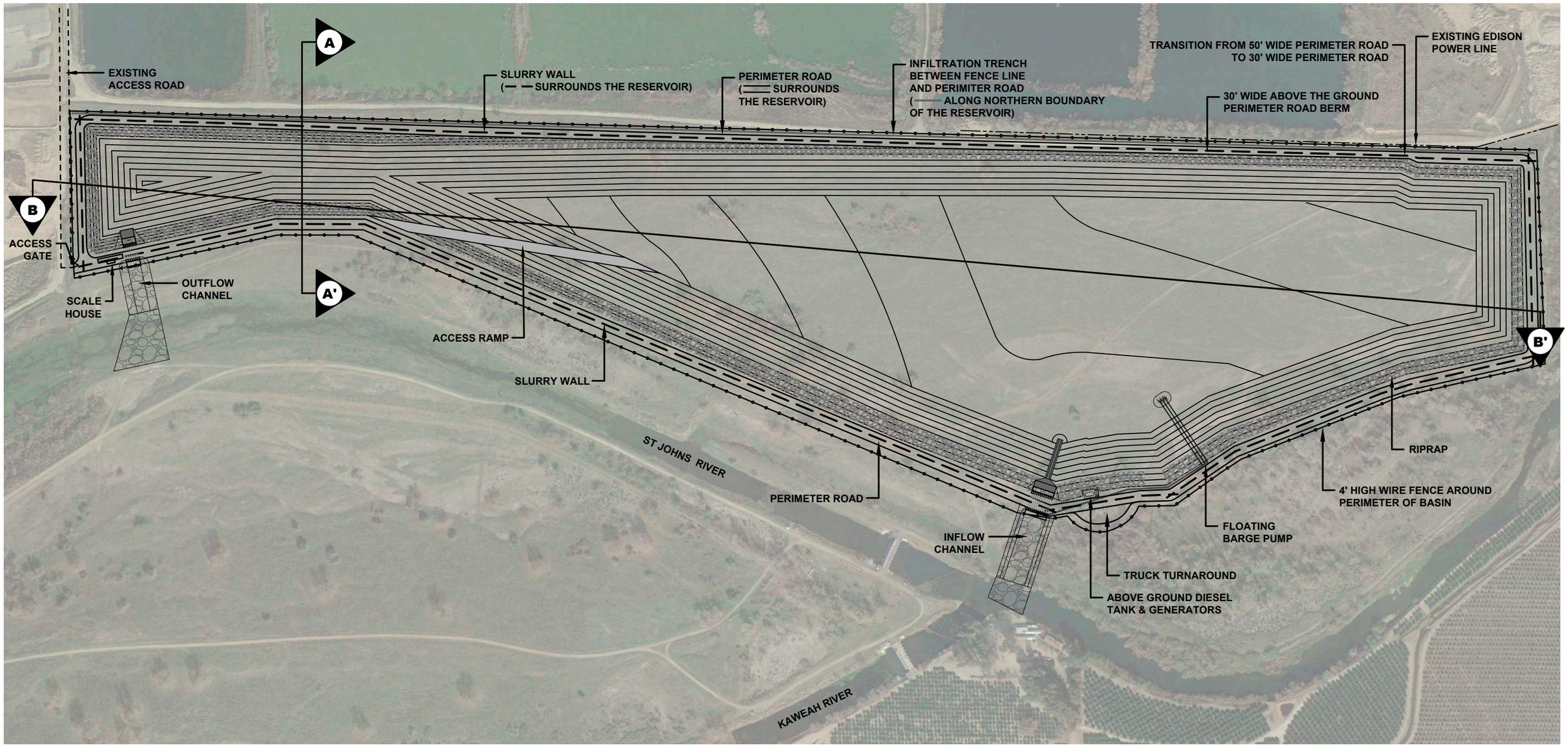


400 FT 0 800 FT

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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL**	FIGURE No. **16** / REV.

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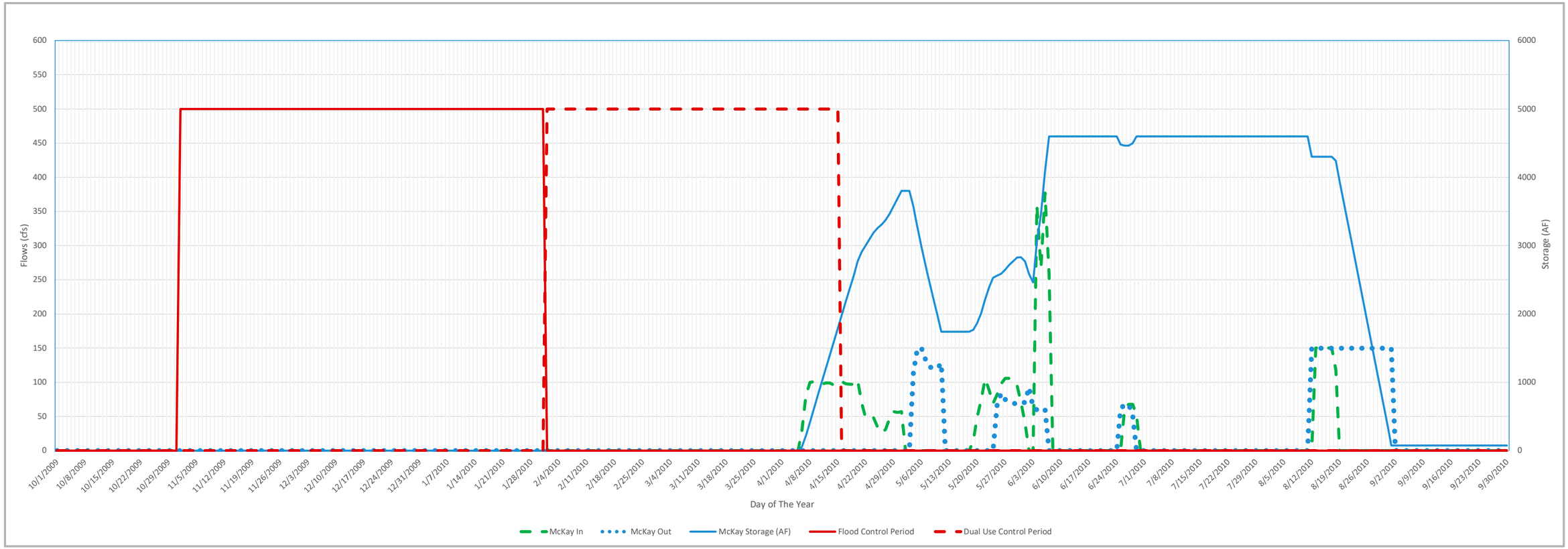


400 FT 0 800 FT

REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE AUGUST, 2021
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **COMPLETED RESERVOIR**	FIGURE No. **17** / REV.

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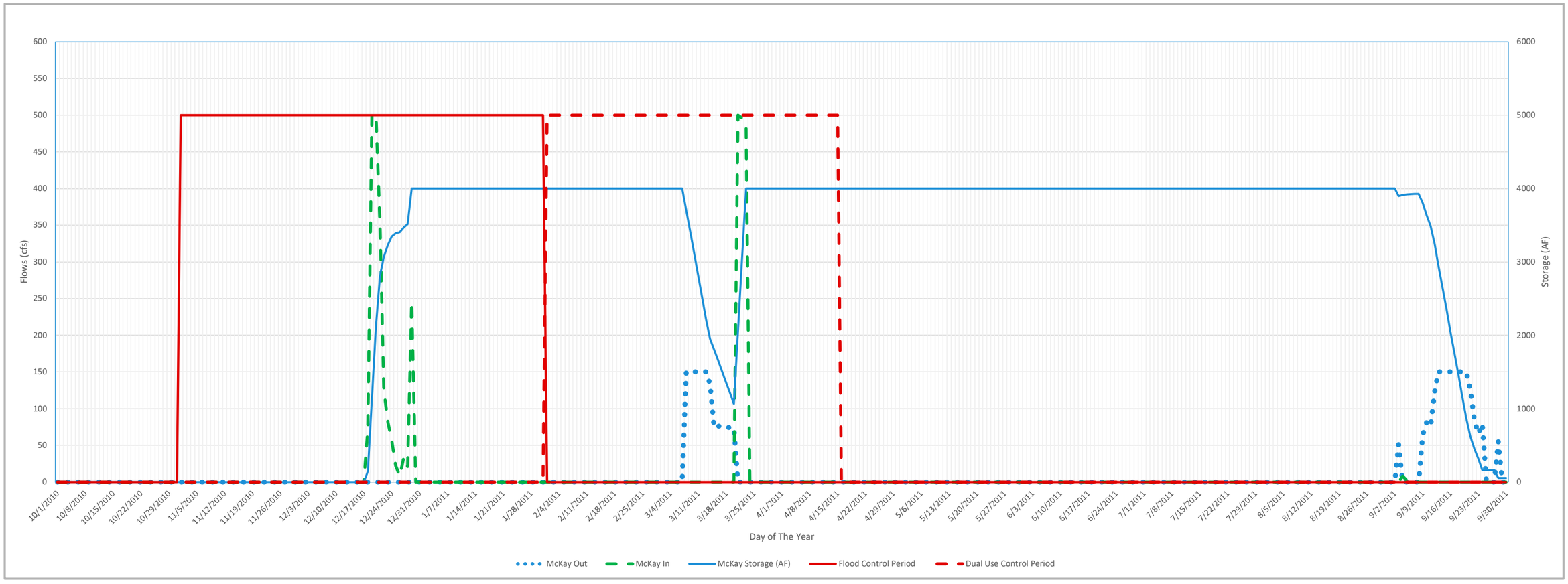
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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2009-2010**	FIGURE No. **18A** / REV.

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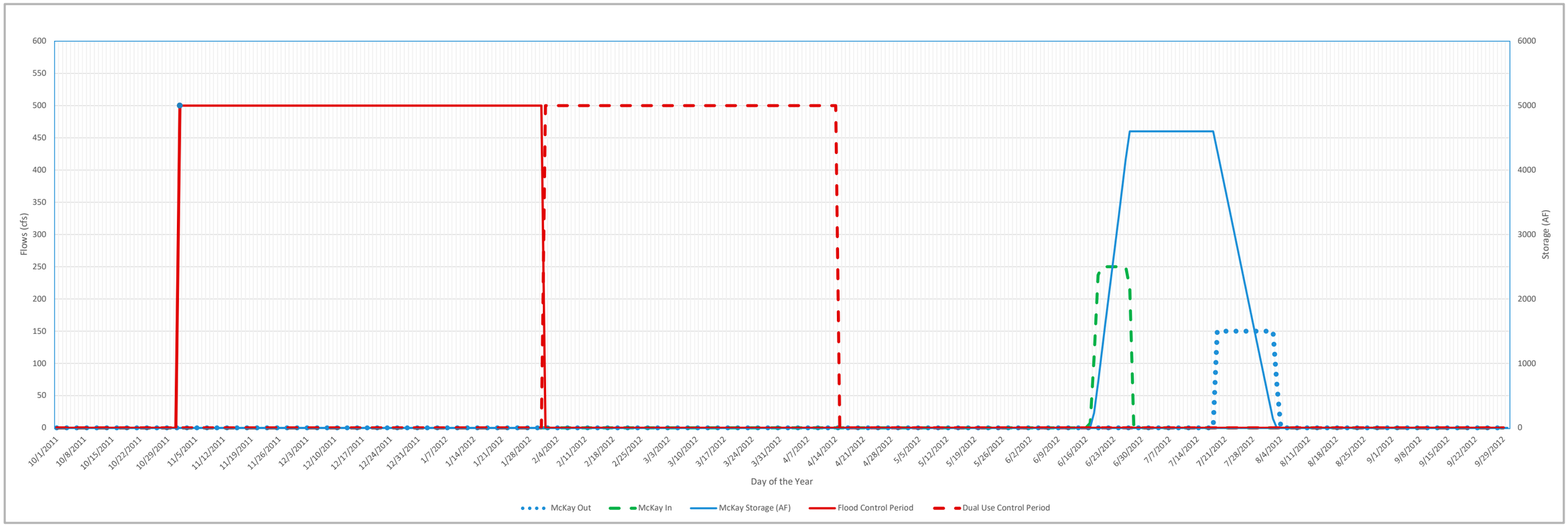
N:\Irvine\Projects\SESPE Consulting\02125 McKay Point Reservoir EIR Update\03 Evaluation\Water Balance\McKay Point Water Resource Model\Figures 18A-D - Master.ai



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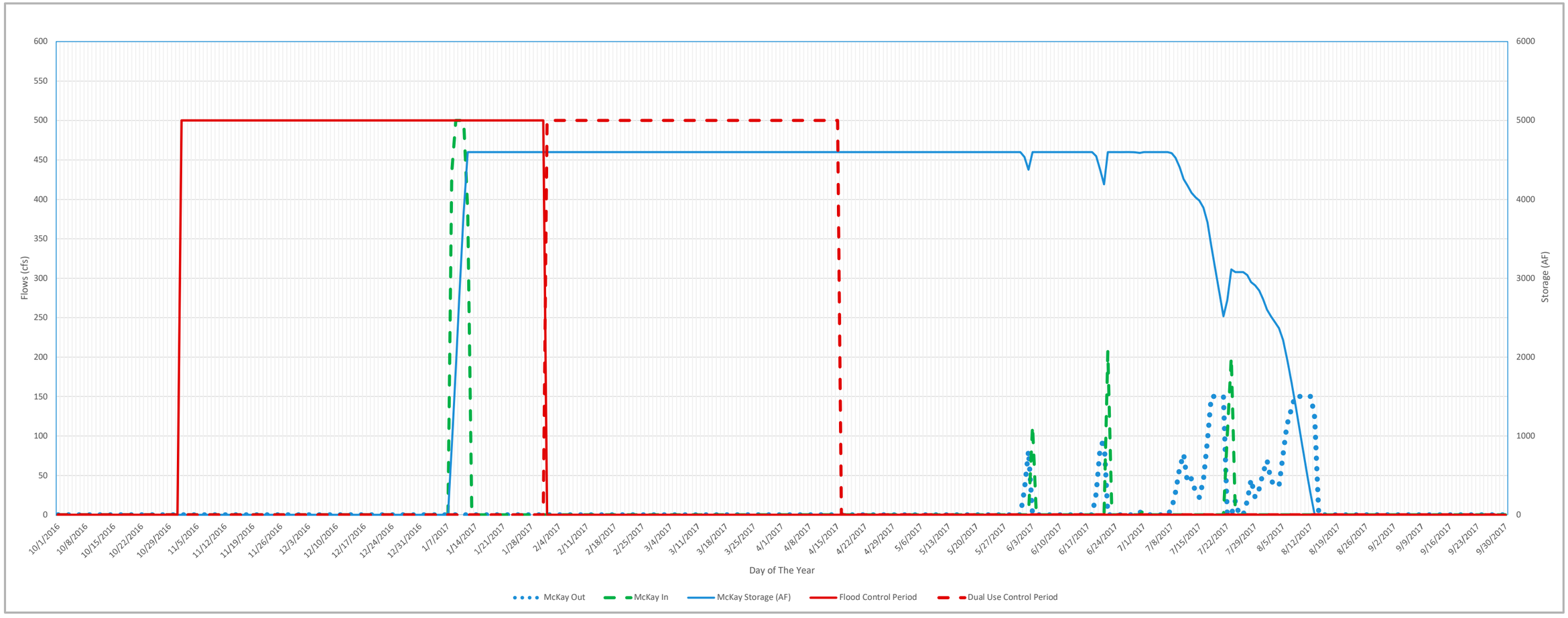
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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**		PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2010-2011**	FIGURE No. **18B**	REV.

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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417 THIS DRAWING AND ITS CONTENTS ARE CONFIDENTIAL, ARE SUBJECT TO RETURN ON DEMAND AND MAY NOT BE COPIED OR DISCLOSED TO ANY THIRD PARTY OR USED DIRECTLY OR INDIRECTLY FOR ANY OTHER PURPOSE THAN AS EXPRESSLY DETERMINED IN WRITING BY SLR INTERNATIONAL CORPORATION	PROJECT **MCKAY POINT RESERVOIR PROJECT** TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2011-2012**	PROJECT No. 117.02125.00002 FIGURE No. **18C** REV.

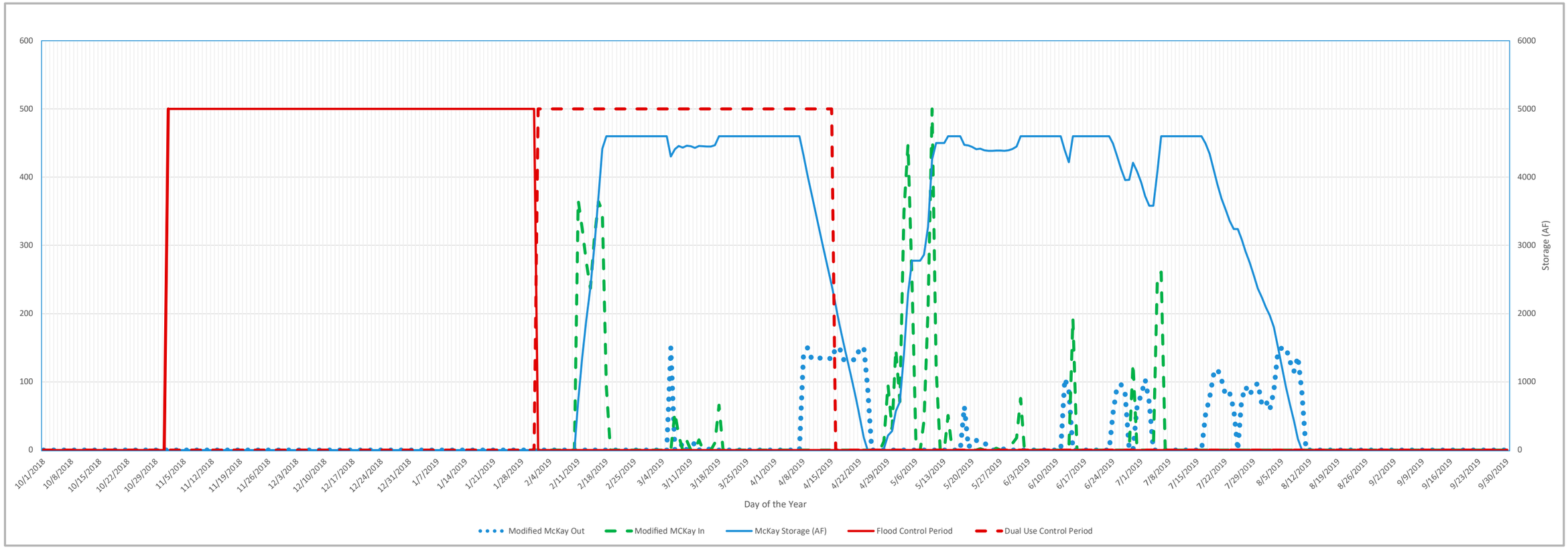
N:\Irvine\Projects\SESPE Consulting\02125 McKay Point Reservoir EIR Update\03 Evaluations\Water Balance\McKay Point Water Resource Model\Figures 18A-D - Master.ai



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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2016-2017**	FIGURE No. **18D** REV.

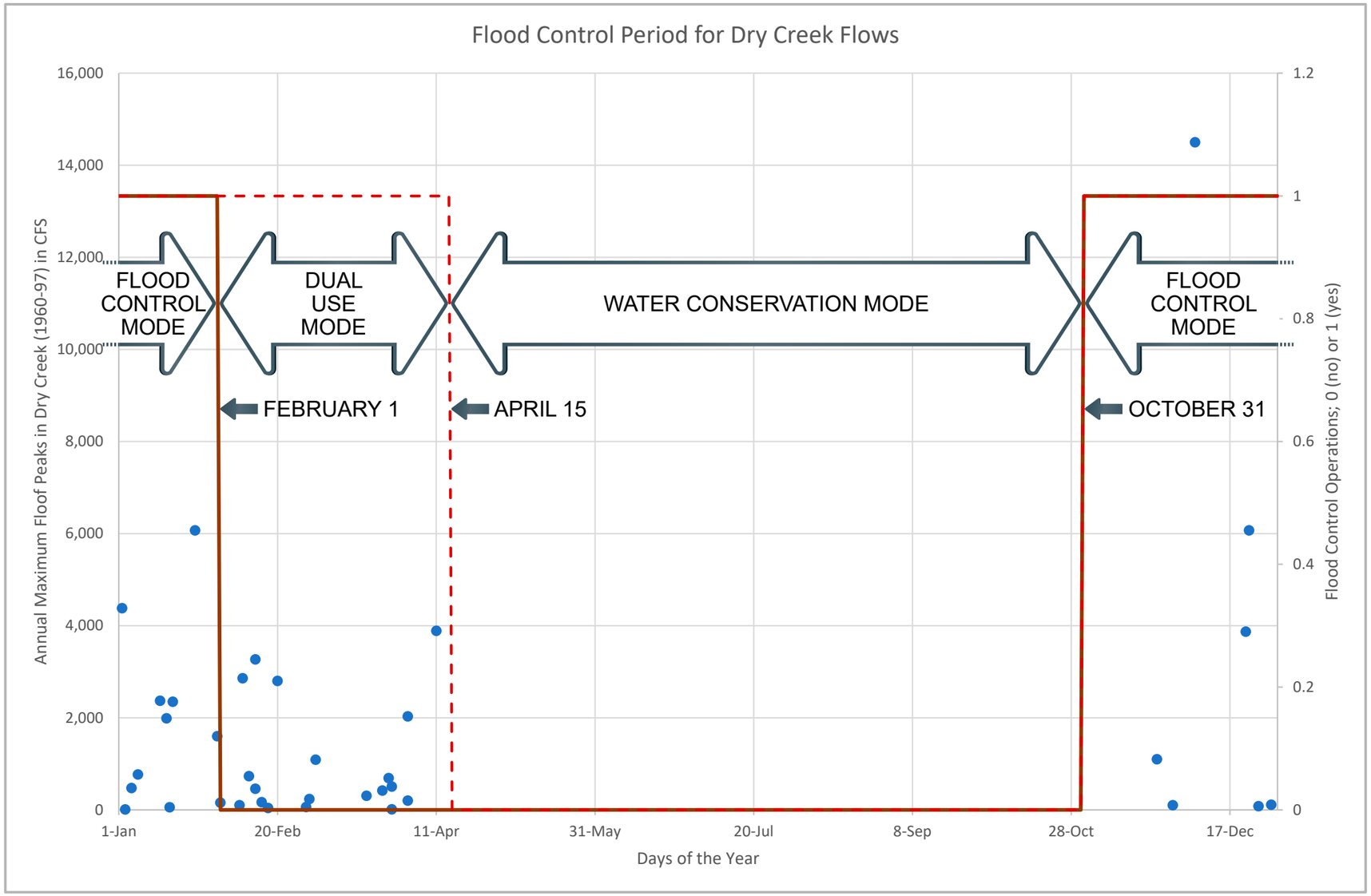
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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2018-2019**	FIGURE No. **18E** REV.

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N:\Irvine\Project\SESPE Consulting\02125 McKay Point Reservoir EIR Update\03 Evaluation\Water Balance\McKay Point Water Resource Model\Figure 19 - Master.ai

REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417 THIS DRAWING AND ITS CONTENTS ARE CONFIDENTIAL, ARE SUBJECT TO RETURN ON DEMAND AND MAY NOT BE COPIED OR DISCLOSED TO ANY THIRD PARTY OR USED DIRECTLY OR INDIRECTLY FOR ANY OTHER PURPOSE THAN AS EXPRESSLY DETERMINED IN WRITING BY SLR INTERNATIONAL CORPORATION	PROJECT **MCKAY POINT RESERVOIR PROJECT** TITLE **ANNUAL MAXIMUM DAILY FLOOD FLOWS IN DRY CREEK ILLUSTRATING RESERVOIR OPERATING MODES**	PROJECT No. 117.02125.00002 FIGURE No. **19** REV.

APPENDICES

DRAFT

ATTACHMENT A

GEOLOGIC CROSS SECTIONS

DRAFT



LEGEND

GEOLOGIC CROSS-SECTION A-A' & B-B'

ANALYSIS SECTION

N

0 800 1,600

SCALE (FEET)

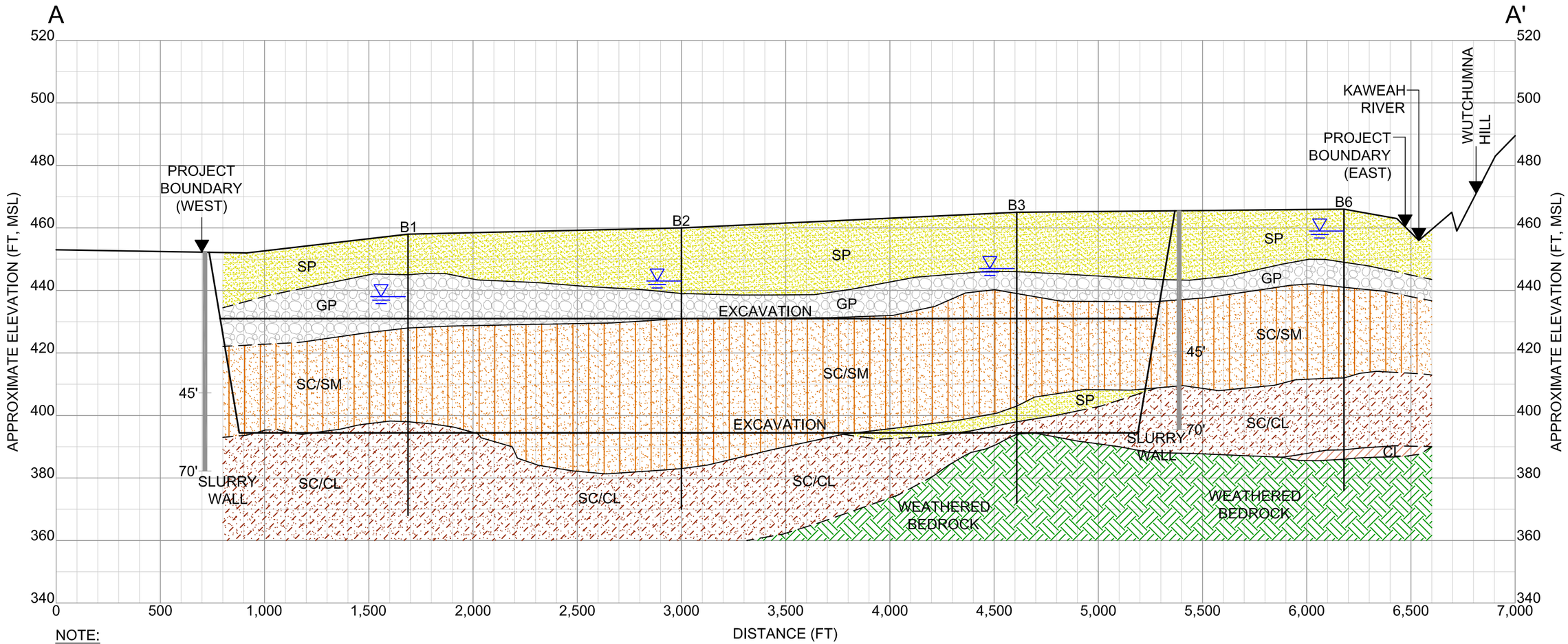
Source: Image from Google Earth Pro

Seepage Analysis Section and Boring Location Map

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 1 | June 2016 | SLR Consulting USA Pty Ltd Consulting Engineers & Scientists

N:\Irvine\CAD\0228-SESPE-McKay Point\04_REFERENCE\0228_Cross Sections.dwg 6/23/2016 2:55 PM



NOTE:
1. SANDOVAL DOMESTIC WELL LOCATED APPROXIMATELY 4,000 FEET WEST OF SECTION. WATER ELEVATION = 440.98

LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- CL: Clay
- GROUNDWATER ELEVATION DURING DRILLING

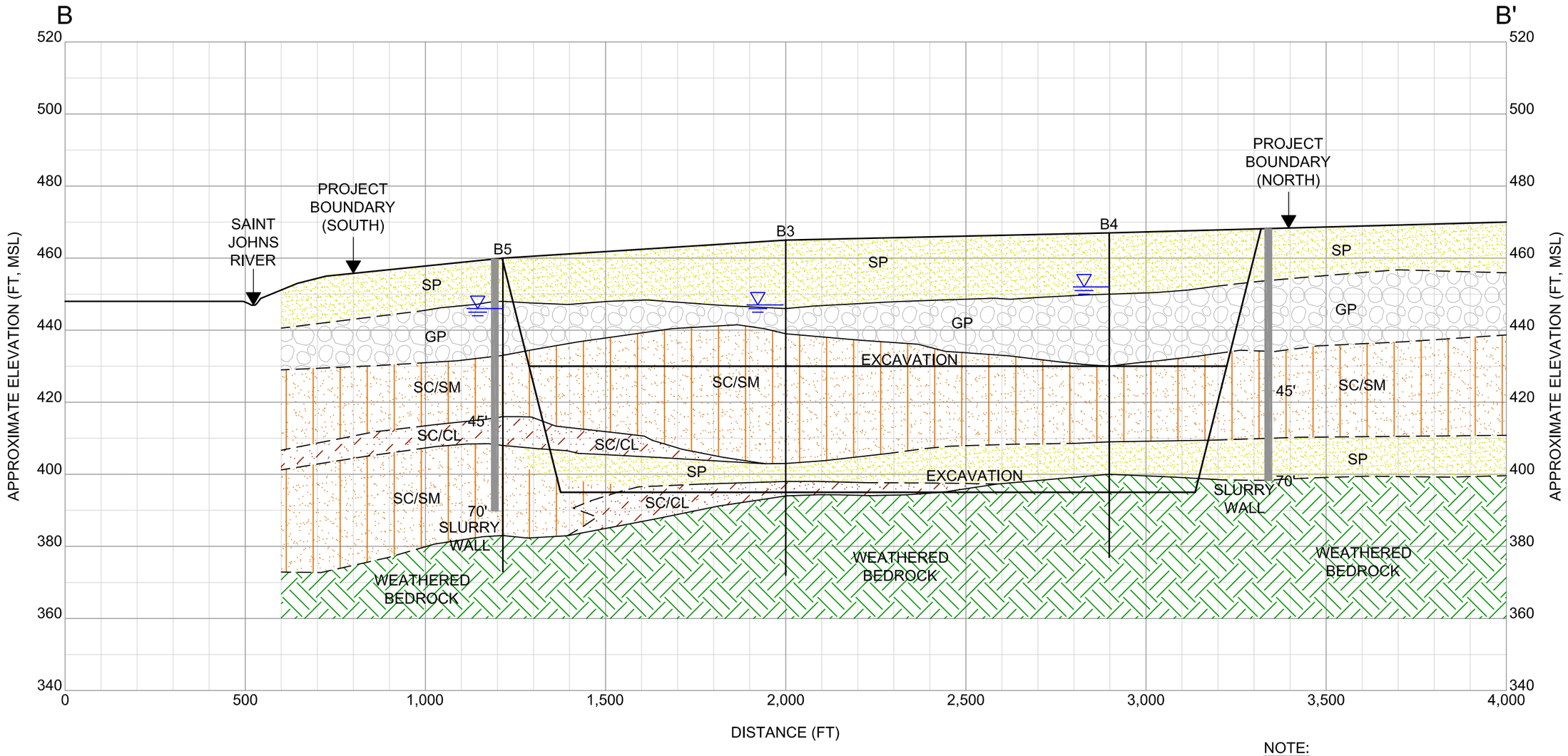
0 500 1,000
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x15

Cross Section A-A'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 2 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

P:\CAD\0228 McKay Point\0228_Cross Sections.dwg 7/11/12 13:12



LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- GROUNDWATER ELEVATION DURING DRILLING

NOTE:
1. HEIDMAN WELL LOCATED APPROXIMATELY 2,600 FEET NORTH OF SECTION. WATER ELEVATION = 460.02

0 300 600
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x10

Cross Section B-B'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 3 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

P:\CAD\0228 McKay Point\0228_Cross Sections.dwg 7/11/12 13:13

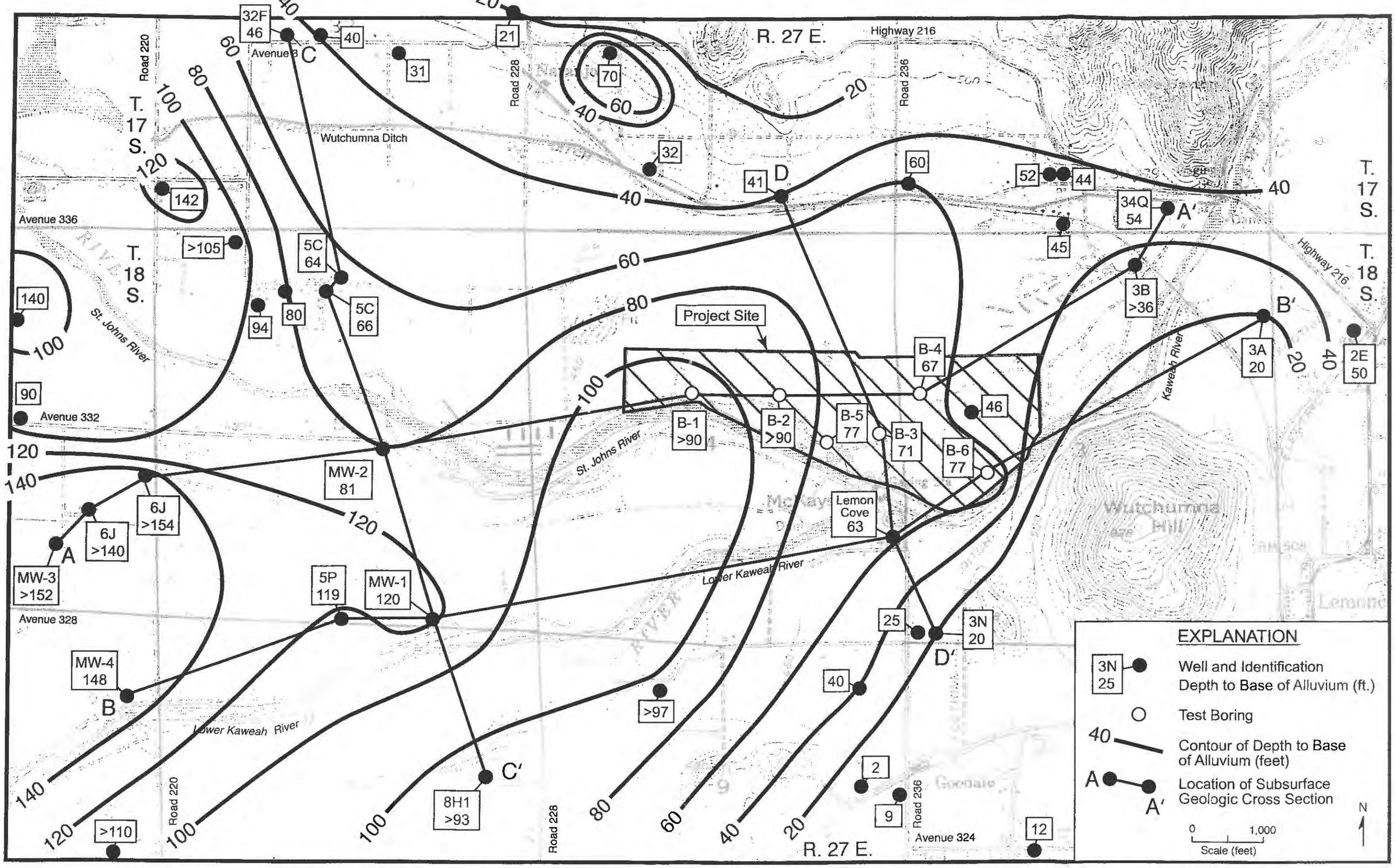


FIGURE 1 - LOCATION OF SELECTED WELLS, TEST HOLES, SUBSURFACE GEOLOGIC CROSS SECTIONS, AND DEPTH TO BASE OF ALLUVIUM

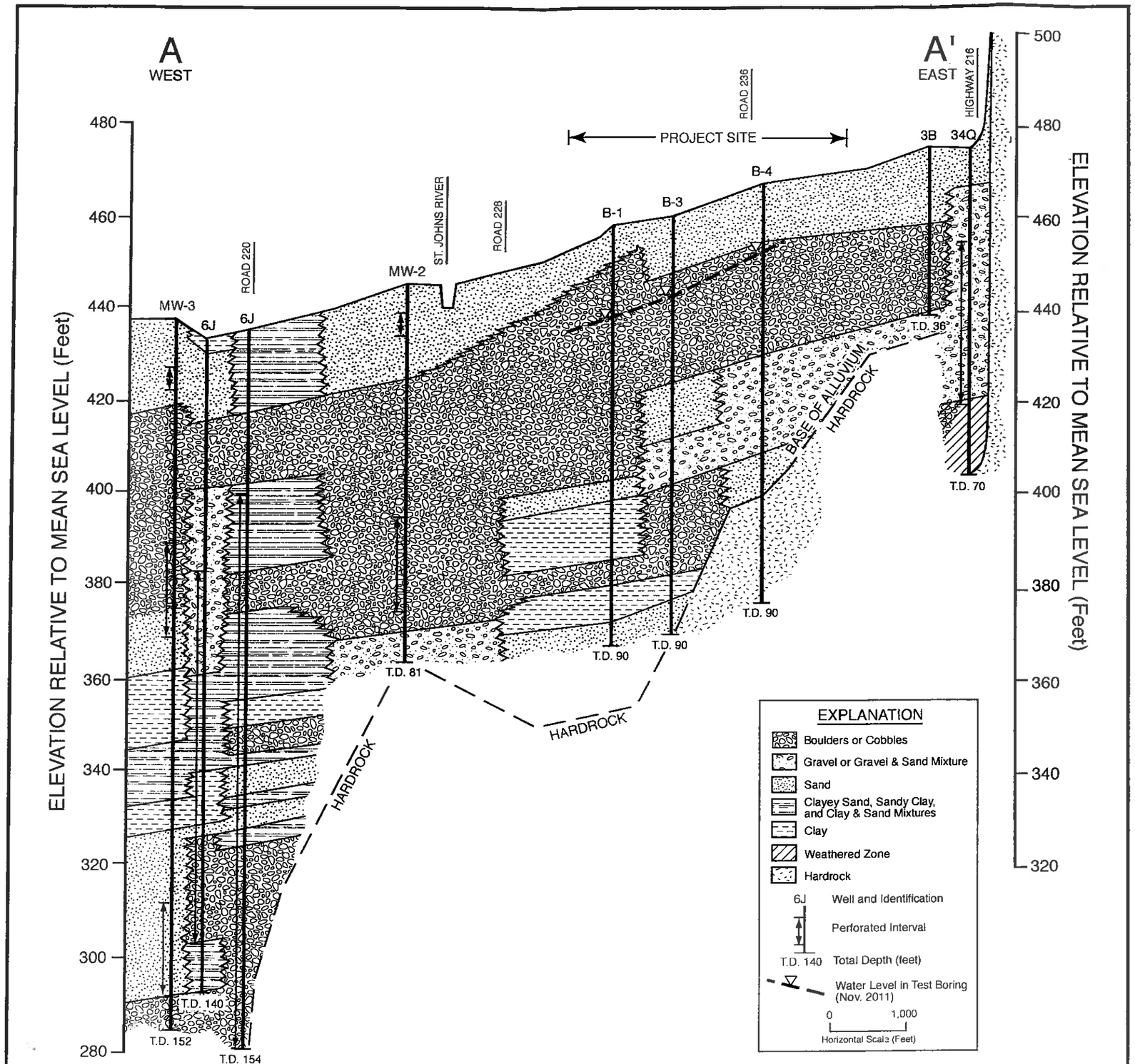


FIGURE 2 - SUBSURFACE GEOLOGIC CROSS SECTION A - A'

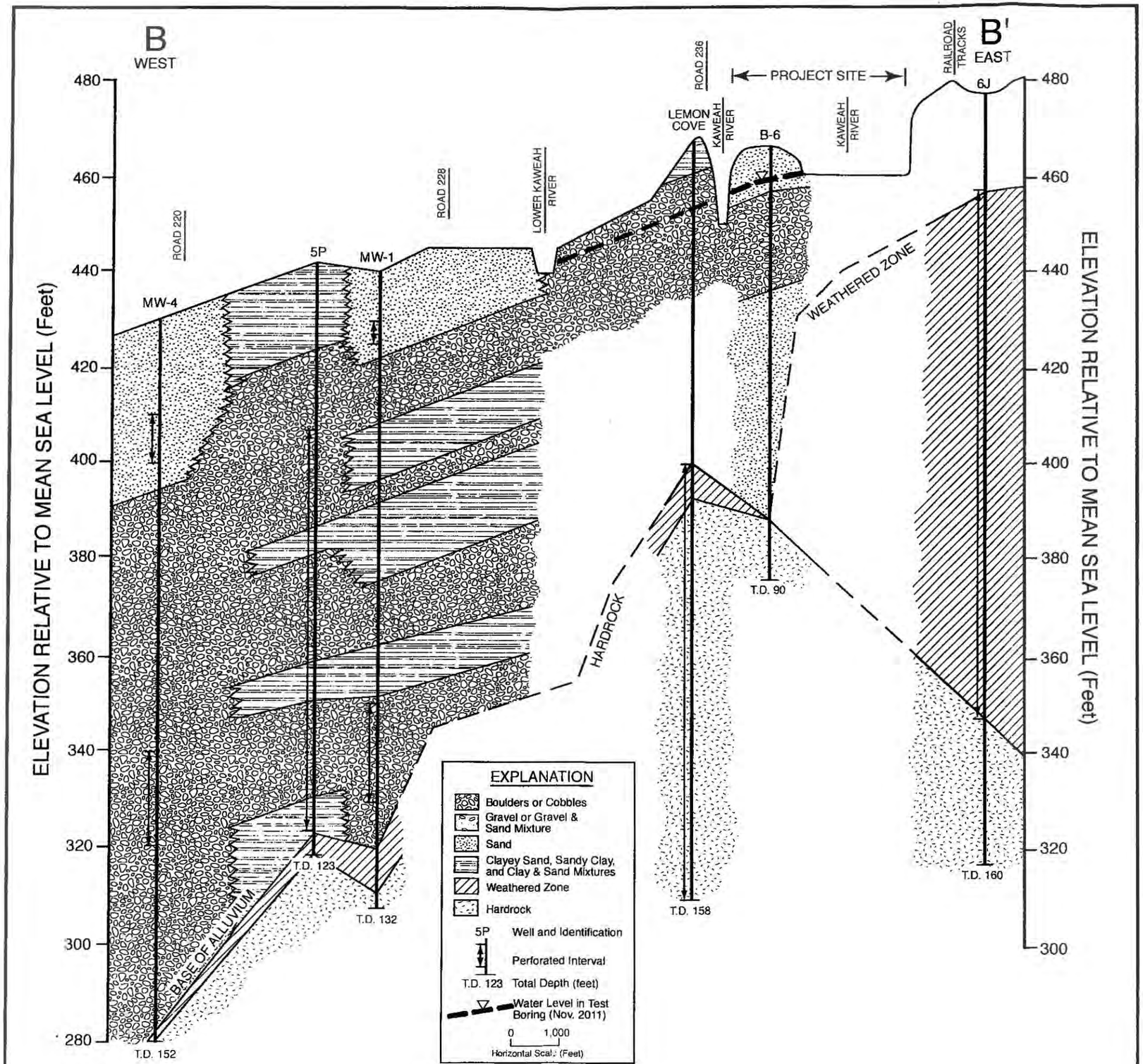


FIGURE 3 - SUBSURFACE GEOLOGIC CROSS SECTION B - B'

C
NORTH

C'
SOUTH

460
440
420
400
380
360
340
320
300
280
260

ELEVATION RELATIVE TO MEAN SEA LEVEL (Feet)

32F
WUTCHUMNA DITCH
ST. JOHNS RIVER
LOWER KAWEAH RIVER
5C 5C
MW-2
MW-1
8H1
BASE OF ALLUVIUM
TOP OF WEATHERED ZONE
TOP OF HARDROCK
WEATHERED ZONE
HARDROCK
T.D. 110
T.D. 130
T.D. 81
T.D. 93
T.D. 132
T.D. 190
O.H. 70

EXPLANATION

- Boulders or Cobbles
- Gravel or Gravel & Sand Mixture
- Sand
- Clayey Sand, Sandy Clay, and Clay & Sand Mixtures
- Clay
- Weathered Zone
- Hardrock
- 32F — Well and Identification
- Perforated Interval
- T.D. 110 — Total Depth (feet)

0 1,000
Horizontal Scale (Feet)

FIGURE 4 - SUBSURFACE GEOLOGIC CROSS SECTION C - C'

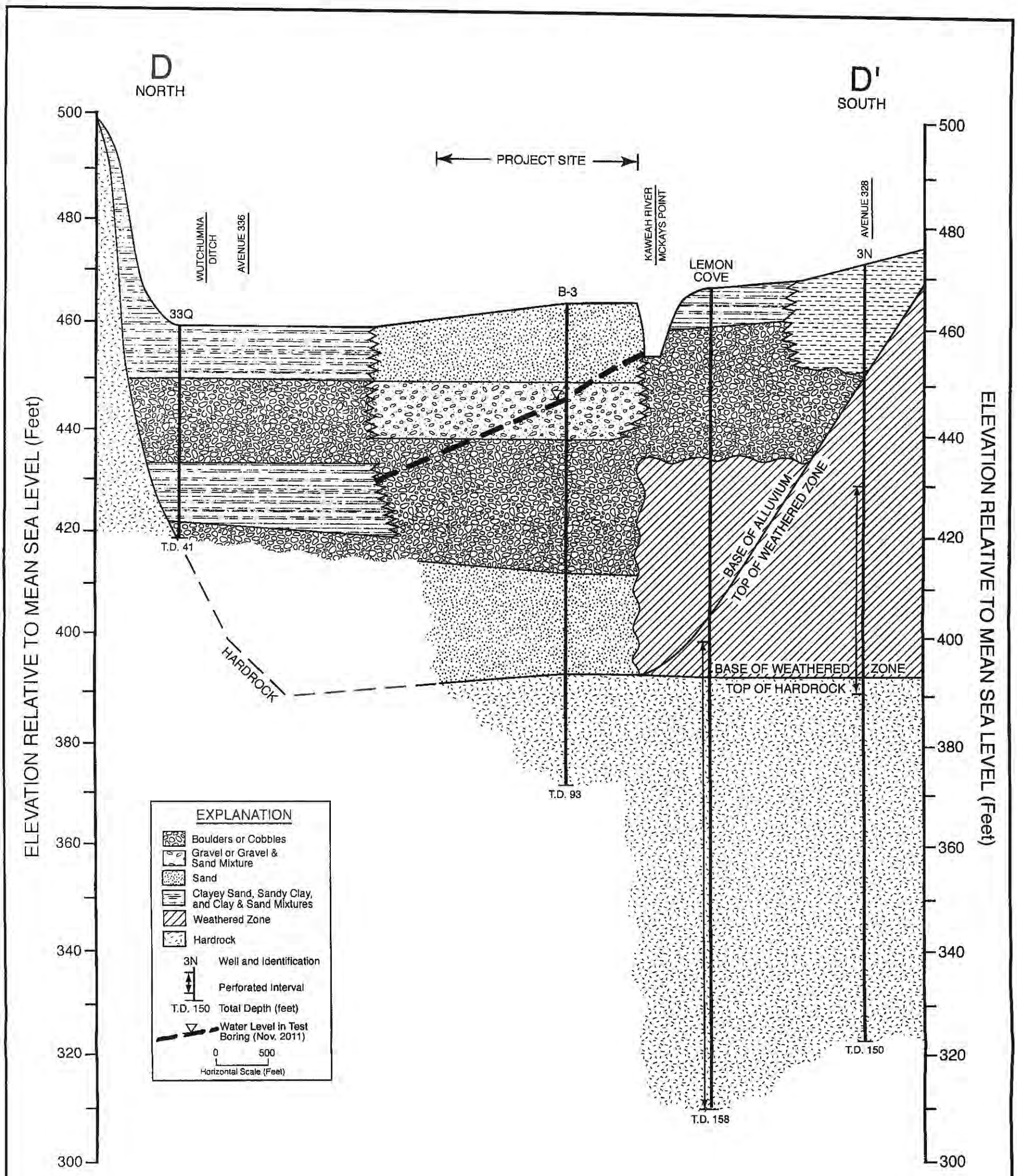


FIGURE 5 - SUBSURFACE GEOLOGIC CROSS SECTION D - D'

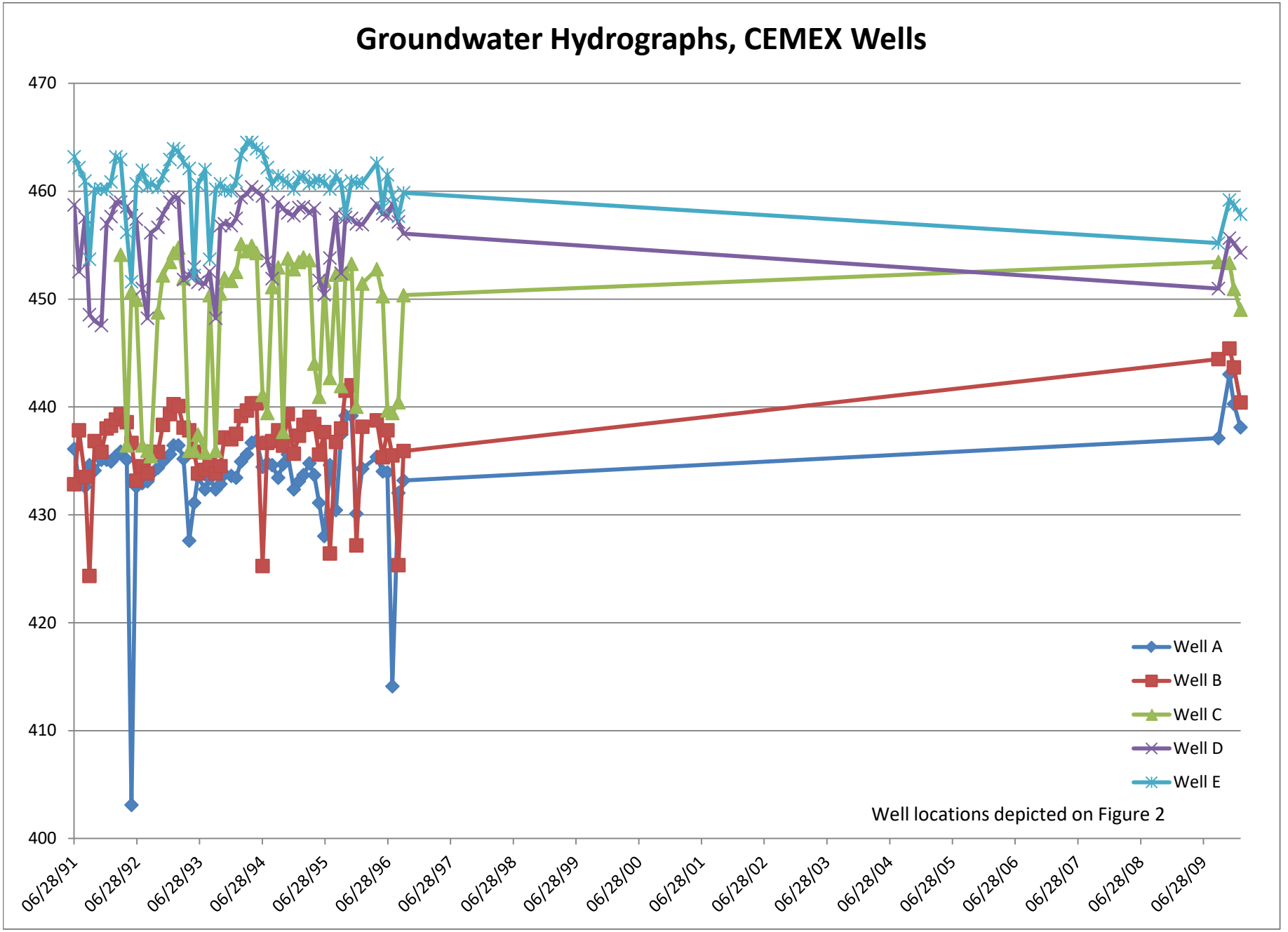
ATTACHMENT B

CEMEX WELLS HYDROGRAPHS

DRAFT



CEMEX Well Locations


Groundwater Hydrographs, CEMEX Wells
470
460
450
440
430
420
410
400
06/28/91
06/28/92
06/28/93
06/28/94
06/28/95
06/28/96
06/28/97
06/28/98
06/28/99
06/28/00
06/28/01
06/28/02
06/28/03
06/28/04
06/28/05
06/28/06
06/28/07
06/28/08
06/28/09
Well A
Well B
Well C
Well D
Well E
Well locations depicted on Figure 2

ATTACHMENT C

FLOODING AND SEDIMENT TRANSPORT MODELING

DRAFT

17701 Cowan, Suite 210
Irvine, CA 92614
Main: (949) 553-8417
Fax: (949) 553-8423

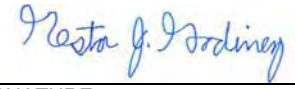
COMPUTATION COVER SHEET

Client: SESPE Consulting, Inc.

Project: McKay Point Reservoir Project **Project:** 117.00981 **Task No.:** 01

Title of Computations: River Analysis

Computations By:



SIGNATURE — 06/17/2016 DATE

Nestor Godinez, P.E. / Senior Staff Engineer
PRINTED NAME AND TITLE

Computations Checked By:

SIGNATURE — 06/17/2016 DATE

Tom Patterson, PhD / Senior Principal
PRINTED NAME AND TITLE

Approved By
(PM or Designate):

SIGNATURE — 06/17/2016 DATE

Ian Hutchison, Ph.D. / Principal
PRINTED NAME AND TITLE

Approval Notes:

Revisions: (Number and Initial All Revisions)

No.	Sheet	Date	By	Checked By	Approval

Written by: NG Date: 2016 / 62/17 Reviewed by: TP Date: 2016 / 06/ 17
YY MM DD YY MM DD

Client: SESPE Project: McKay Point Reservoir Project No: 117.00981 Task No.: 01

RIVER ANALYSIS

MCKAY POINT RESERVOIR, CALIFORNIA

1. PURPOSE AND SCOPE

This computation package documents the river analysis conducted for the Kaweah River east of McKay Point at the proposed McKay Point Reservoir Project Site. Maximum 1% flood peak flows were used to calculate the maximum water surface elevation. A sediment transport analysis of the river bottom was conducted under average maximum monthly flow.

2. ANALYSIS

The Federal Emergency Management Agency (FEMA) in 2009 and 2012 created Flood Insurance Rate Maps for the 1% flood (Attachment 1). The maps show the extents of areas subject to inundation, the floodway which can contain the 1% flood flow, and (for some areas) the flood water elevation contours. The extents of areas subject to inundation were calculated by FEMA for the Kaweah River and the St. Johns River only for the Kaweah River and the St. Johns River west of McKay Point. FEMA did not calculate such flood elevations for areas east of McKay Point, as they often tend to devote their resources to areas with larger populations.

The HEC-RAS hydraulic software package, released by the United States Army Corps of Engineers, was used to simulate the 1% flood flow at the Kaweah River east of McKay Point. The flow is based upon the raised spillway at the Terminus dam. The peak flow at McKay Point is 18,220 cfs. The peak flow was calculated by the United States Army Corps of Engineers.

The topographic data used was from the LiDAR survey conducted for the Tulare and Visalia basin in 2004. A total of 12 cross sections, spaced at a maximum of 1,000 feet apart, were created along the length of 7,600 feet east of McKay Point of the Kaweah River. For purposes of model stability, cross sections were interpolated throughout the reach with sections positions at distances no larger than 75 feet apart. See Figure 1 for the HEC-RAS cross section locations.

A steady state flow analysis was conducted to calculate the water surface elevations for the peak flow of the 1% flood for the Kaweah River east of McKay Point. This analysis was calibrated to tie into the water surface elevations calculated in the prior analyses

conducted by FEMA in 2009. Therefore, SLR's river analysis supplements the analyses conducted by FEMA west of McKay Point.

Roughness coefficients (Manning's "n" values) utilized in the flow analysis were based on similar values from the 2009 FEMA analyses for the Lower Kaweah River just downstream of McKay Point. The channel "n" value of 0.035 and the overbank "n" value of 0.05 were used in SLR's river analysis.

3. SUMMARY AND CONCLUSIONS

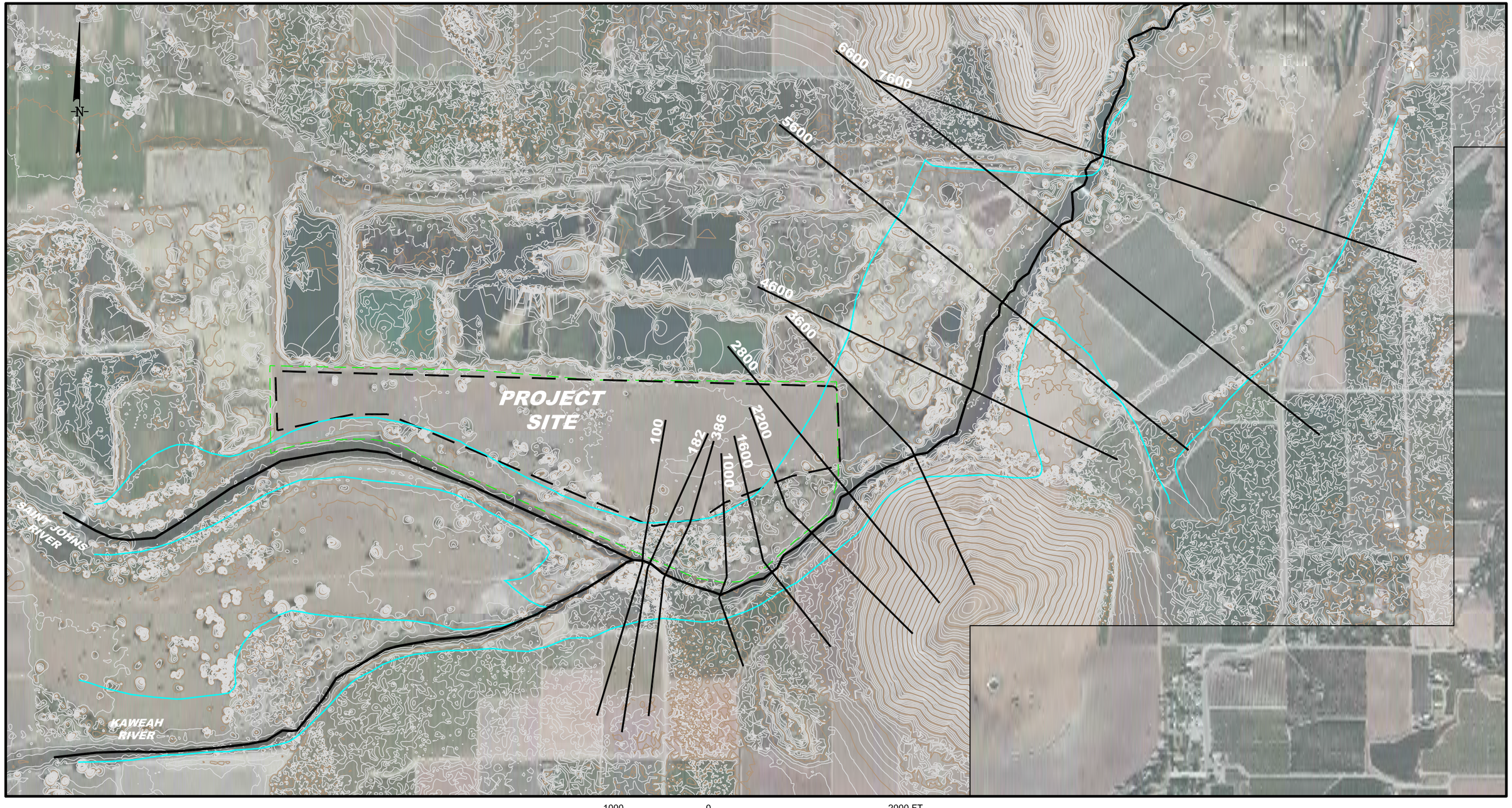
The results of the HEC-RAS steady-state river analysis pre-project are presented in Attachment 2. The results of the HEC-RAS steady-state river analysis post-project are presented in Attachment 3. Results include a summary table and cross section plots of the 12 cross sections.

Figure 2 presents the post-project water surface elevations and floodway for the 1% flood peak flow. SLR's flood calculation results suggest that the floodway for the 1% flood peak flow will not encroach on the proposed reservoir footprint.

REFERENCES

Federal Emergency Management Agency. Flood Insurance Study Tulare County, California and Incorporated Areas. June 2009.

United States Armey Corps of Engineers. HEC-RAS, River Analysis System Hydraulic Reference Manual. Version 4.1. Davis, CA: January 2010.



1000 0 2000 FT

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD) [FEMA 2009, 2012]

HEC-RAS CROSS SECTION LOCATIONS

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS ARE APPROXIMATE

SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

REPORT

CLIENT: **SESPE CONSULTING, INC**

ISSUED DATE: 1/29/15

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PROJECT: **MCKAY POINT RESERVOIR PROJECT**

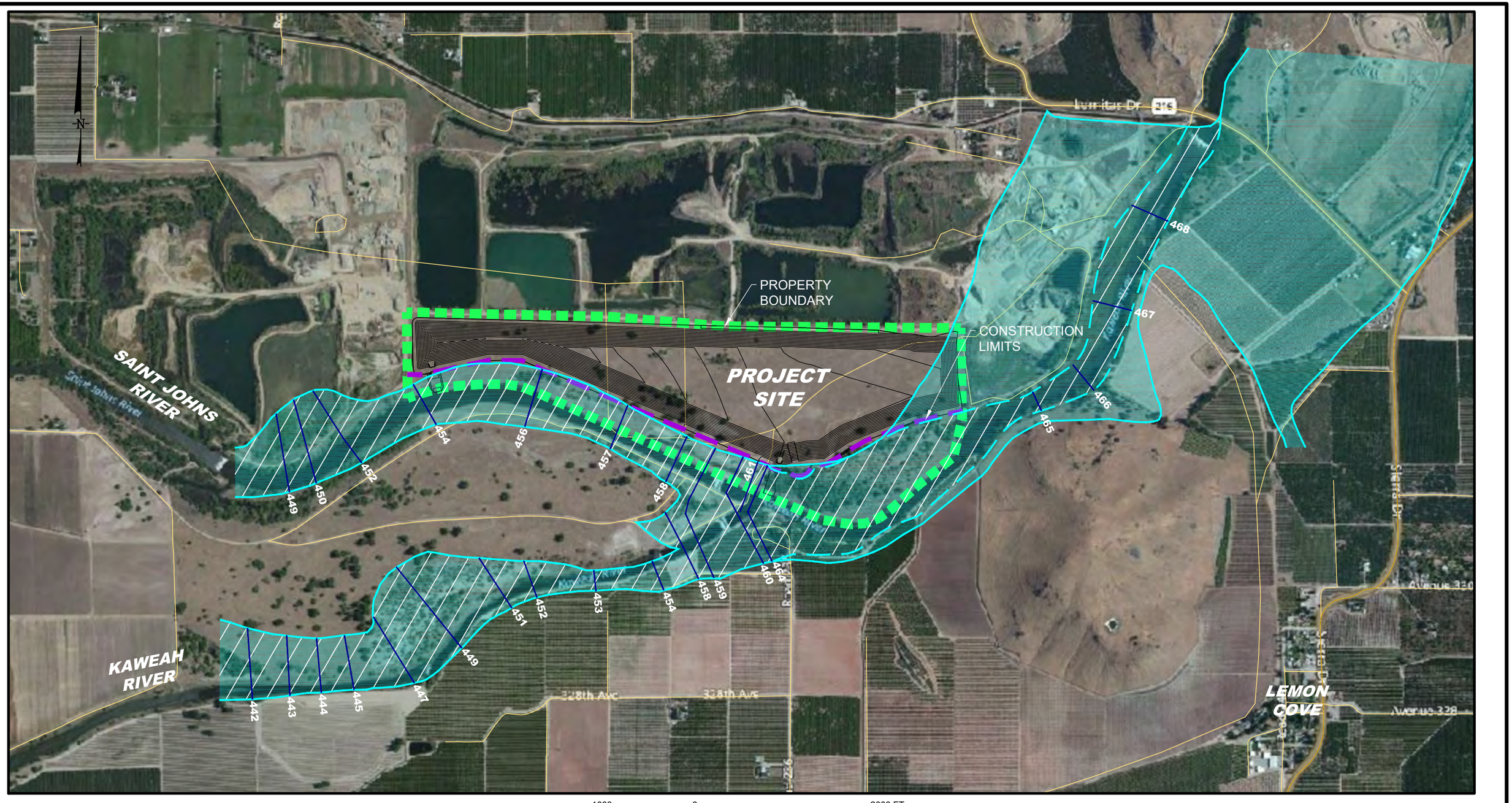
PROJECT No.: 117.00981.00001

TITLE: **HEC-RAS CROSS SECTION LOCATIONS**

FIGURE No.: **01**

REV: A

N:\Irvine\CAD\117.0981.1 McKay Point Reservoir\A01_CAD\A_MODELS\HECRAS\HEC-RAS_CS_LOC.dwg 1/29/2015 10:16 AM



1000 0 2000 FT

LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD) [FEMA 2009, 2012]
- FLOODWAY AREA - SITE-SPECIFIC ANALYSIS [FEMA 2009, SLR 2016]
- FLOOD ELEVATION CONTOUR (FT - MSL)

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS AND BASE FLOODWAY AREAS ARE APPROXIMATE

SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 06/17/16
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.00981.00001
	TITLE **POST-PROJECT FLOOD HAZARD AREA**	FIGURE No. 2 / REV A

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H:\Irvine\CAD\117.0981.1 McKay Point Reservoir\A01 CAD\C SLR-FIGS\HYDROLOGY REPORT\14 BASE FLOW ELEVATIONS.dwg—6/17/2016 5:27 PM

ATTACHMENT 1

FEMA FLOOD INSURANCE RATE MAPS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1987 or later.

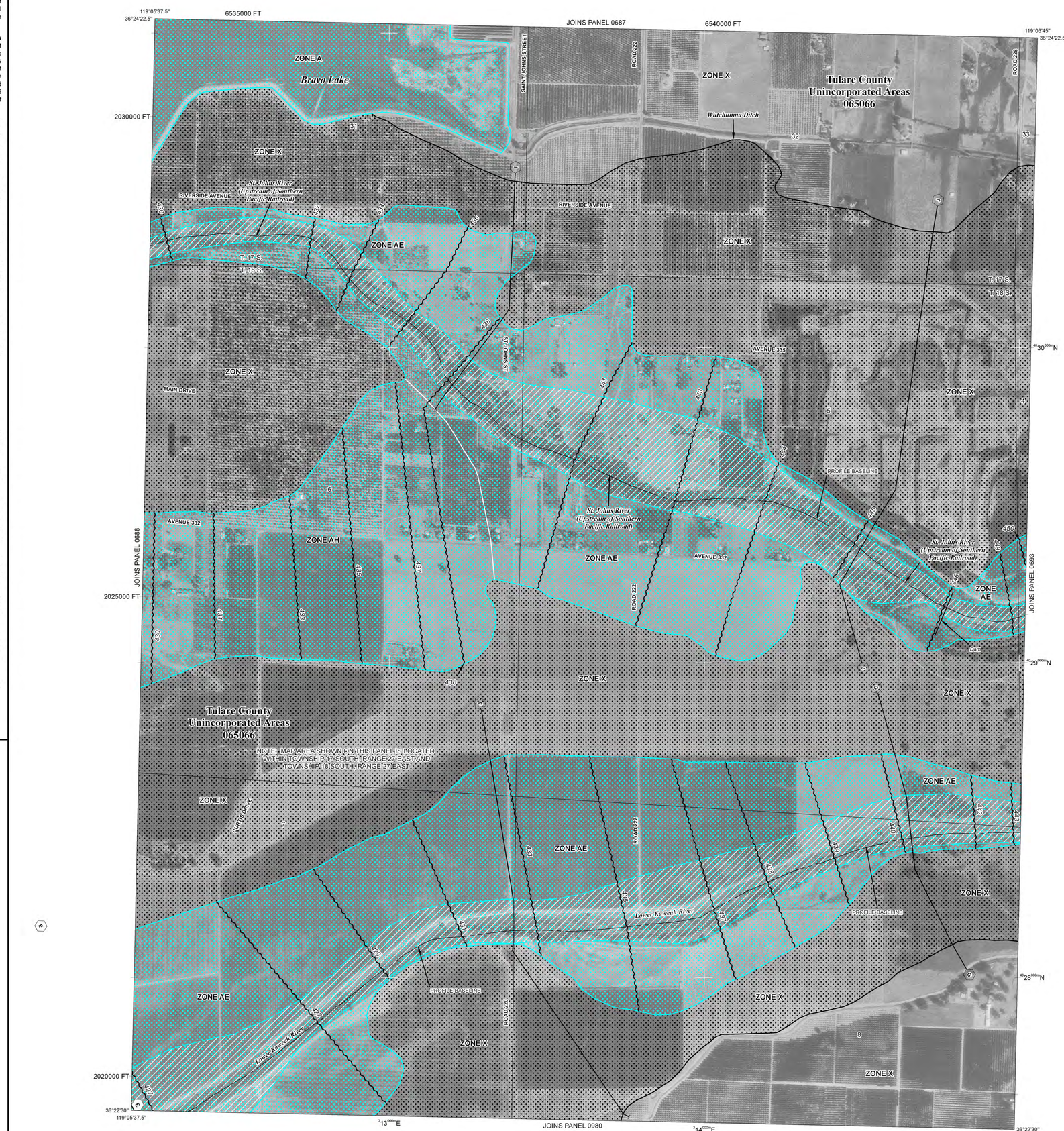
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2 76 000mN — 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone IV (FIPSZONE 0404), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0689E

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 689 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0689	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0689E

EFFECTIVE DATE
JUNE 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1987 or later.

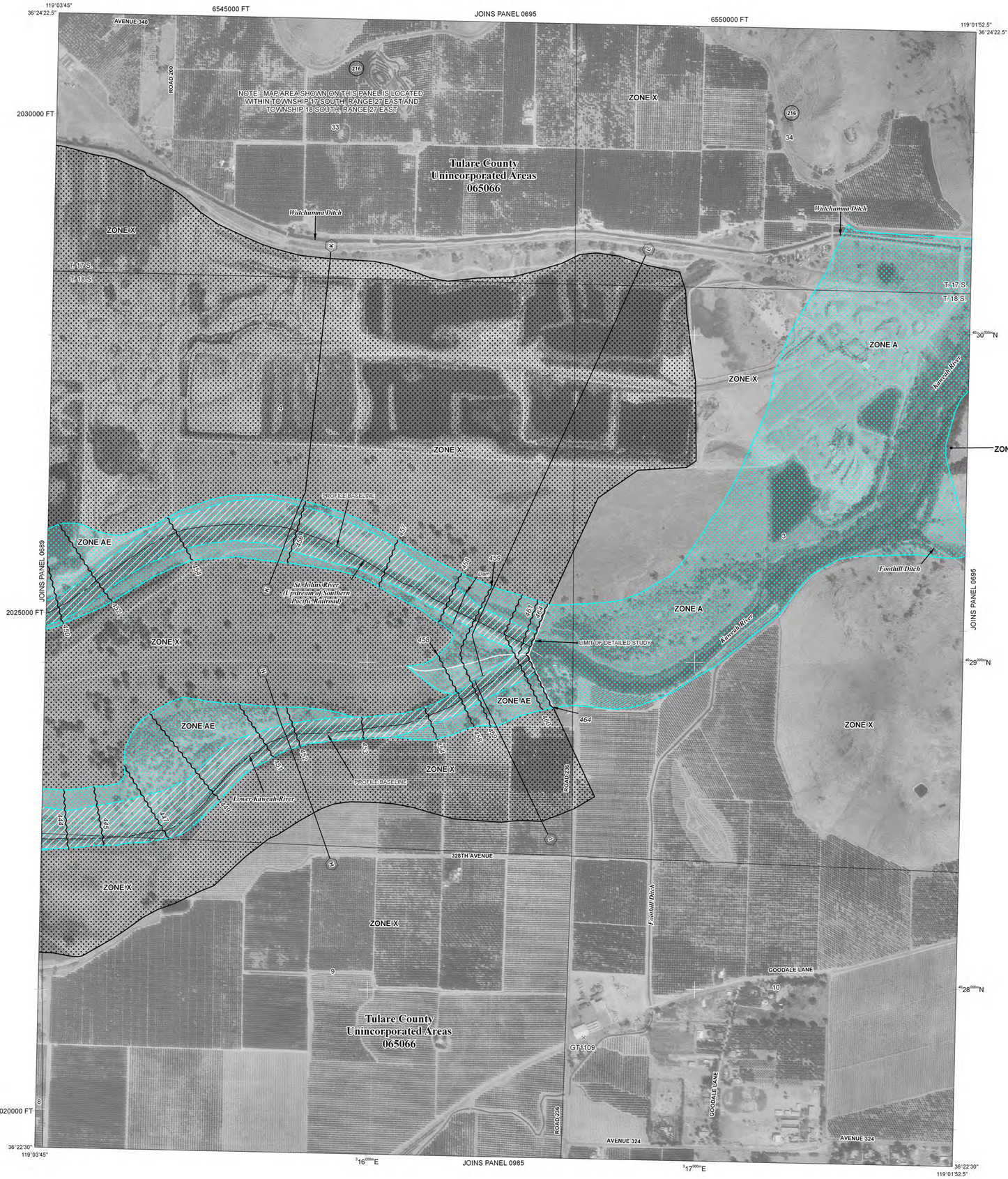
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
2°76'000mN	1000-meter Universal Transverse Mercator grid values, zone 11
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone IV (FIPSZONE 0404), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0693E

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 693 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0693	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0693E

EFFECTIVE DATE
JUNE 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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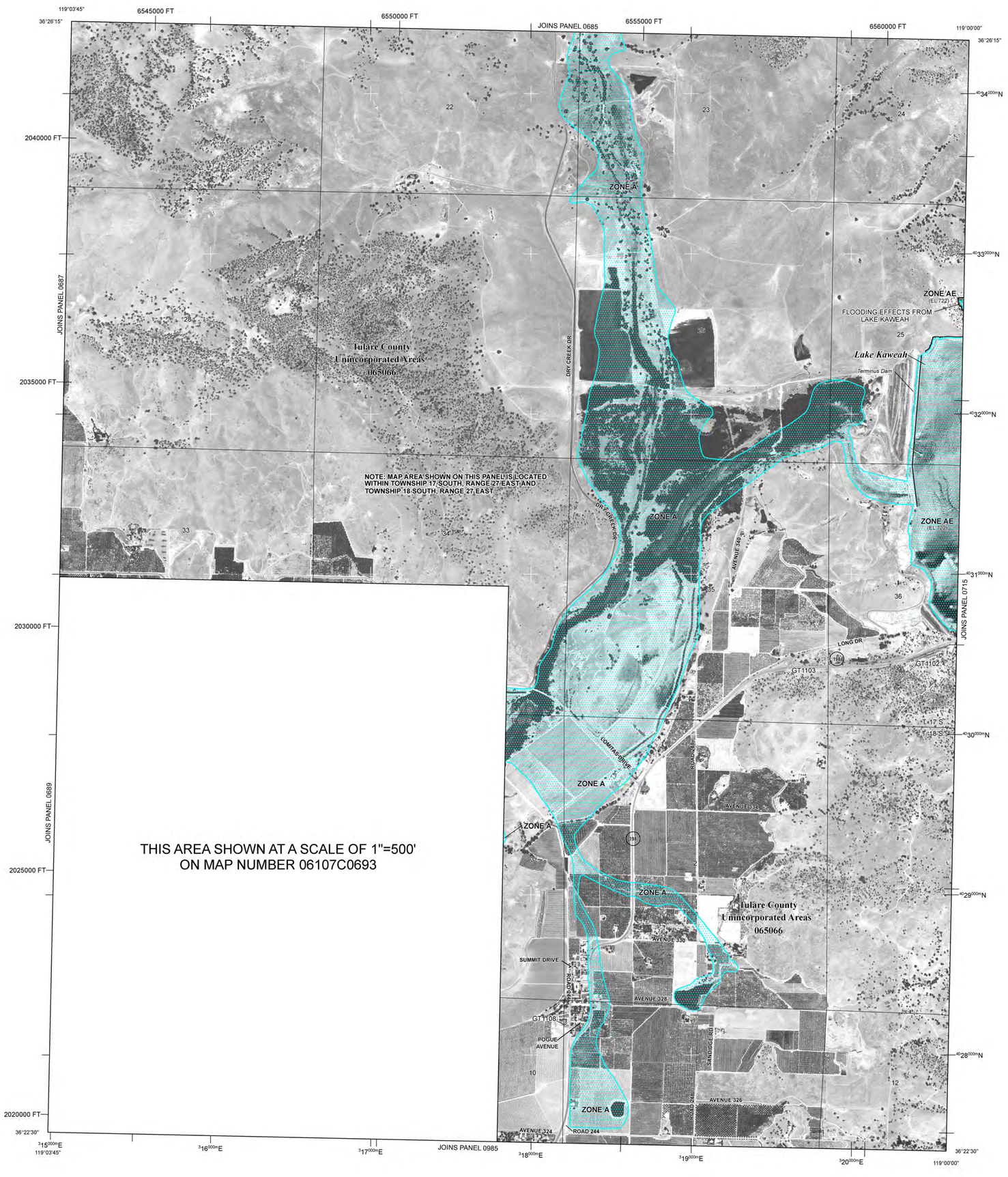
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For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

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- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone IV (FIPSZONE = 404), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

December 18, 2012 –to change Base Flood Elevations, Special Flood Hazard Areas, zone designations, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0695F

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 695 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0695	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0695F

MAP REVISED
December 18, 2012

Federal Emergency Management Agency

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

December 15, 2004

RECEIVED
DEC 21 2004
By

Water Management

Mr. Bruce George
Kaweah Delta Water Conservation District
2975 North Farmerville Blvd.
Farmersville, CA 93223-2303

Dear Mr. George:

This is in response to the request to provide the revised flow at McKay Point for the 1% flood. The revised flow is based upon the raise spillway at the dam. The peak release from the reservoir during this event is 17,900 cfs. The peak flow at McKay Point, including local flow from Dry, Mehrtens, and Yokohl Creeks is 18,220 cfs.

Enclosed is the hourly data for the routing along with 2 plots that show the operation and flows.

If you have any questions, please contact Mr. Wayne Johnson at (916) 557-7139.

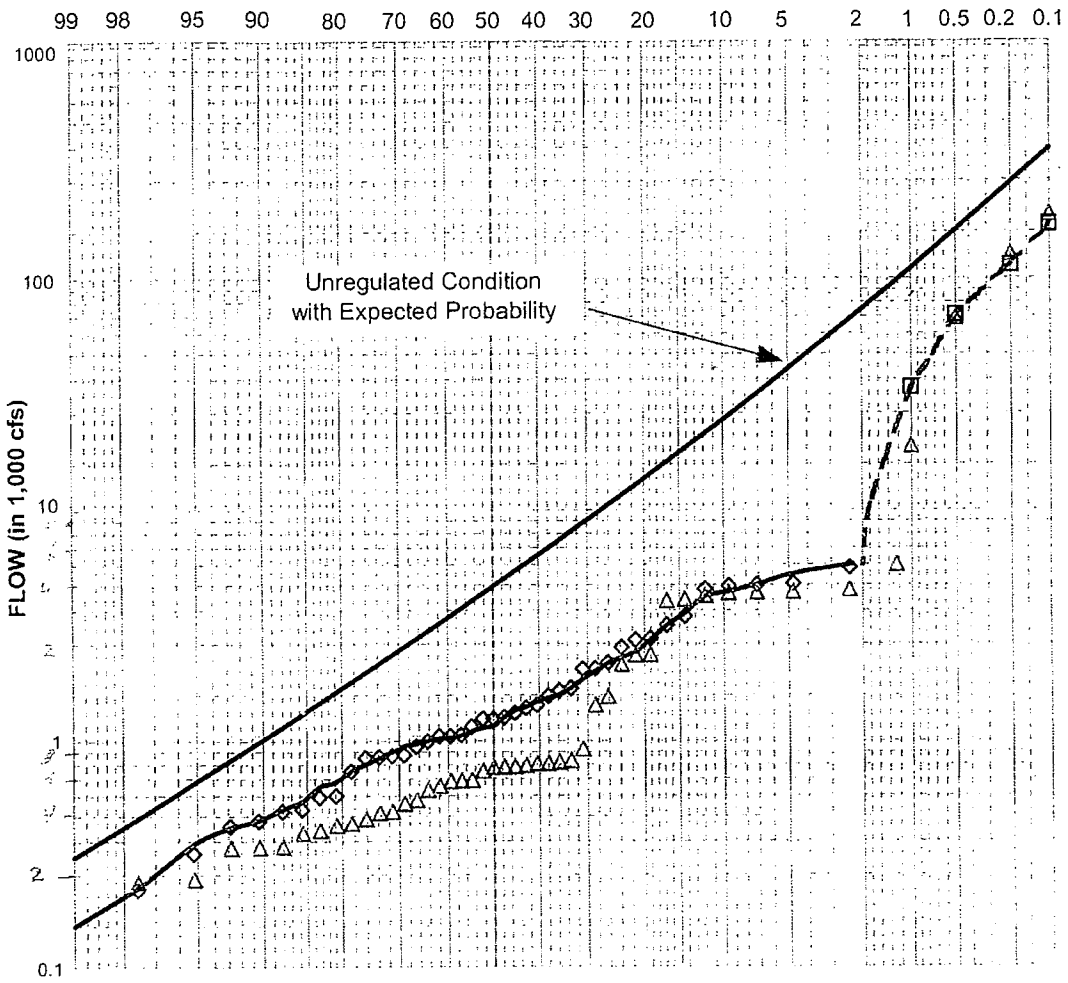
Sincerely,

Wayne L Johnson FOR

Paul E Pugner, PE
Chief Water Management Section

Enclosures

Copies Furnished:
Mr. Joe Countryman
MBK Engineers
2450 Alhambra Blvd., 2nd Floor
Sacramento, CA 95817



NOTES: 1. Drainage Area: 561 sq. mi.

2. Period of Record: 1963-2003

3. △ Hypothetical operation with raised spillway.

TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

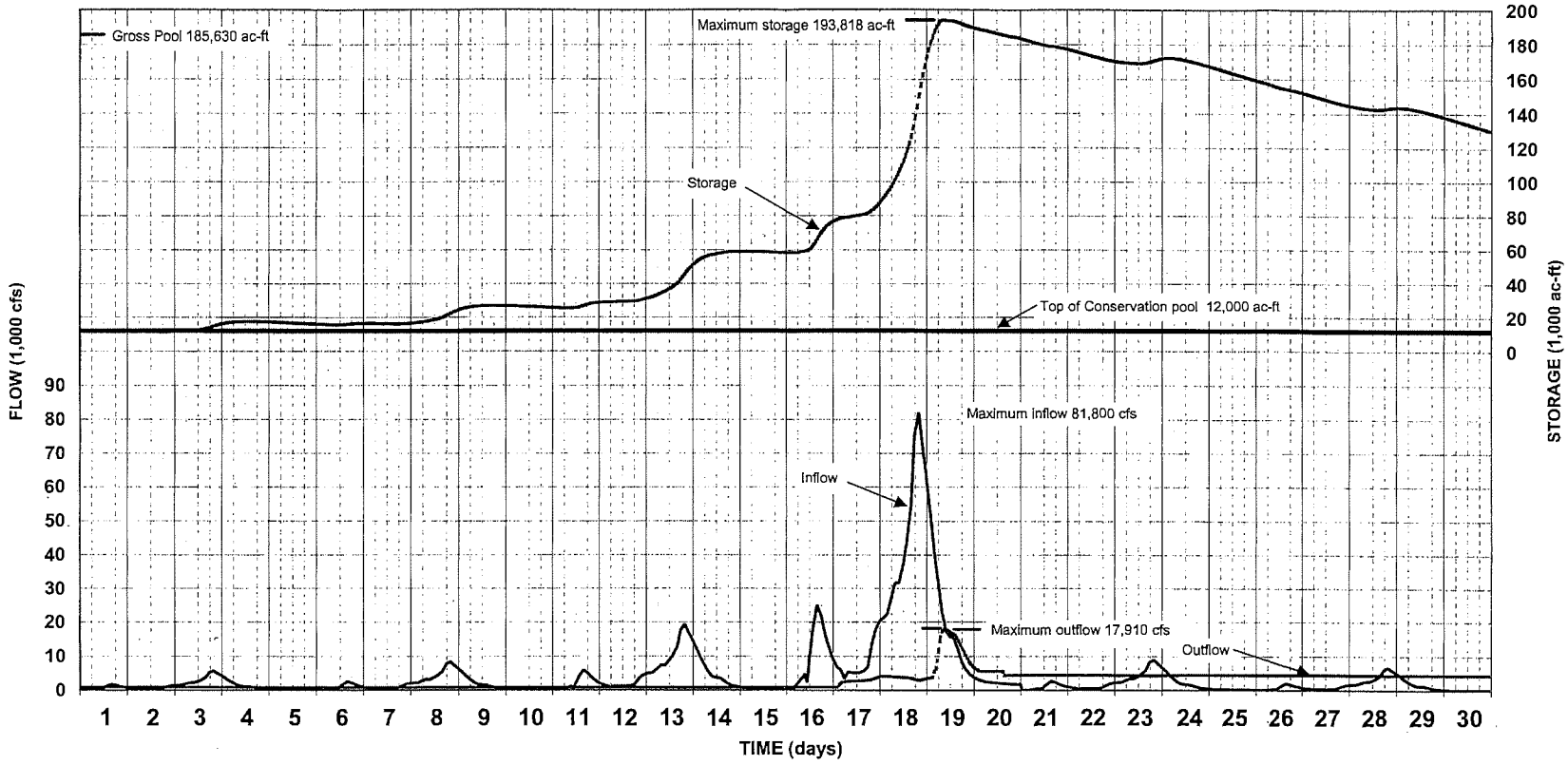
KAWEAH RIVER BELOW TERMINUS DAM
RAIN FLOOD FREQUENCY CURVES
(REGULATED CONDITION)

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

Prepared by WLJ

Revised Dec 2003

PLATE 8-10



TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

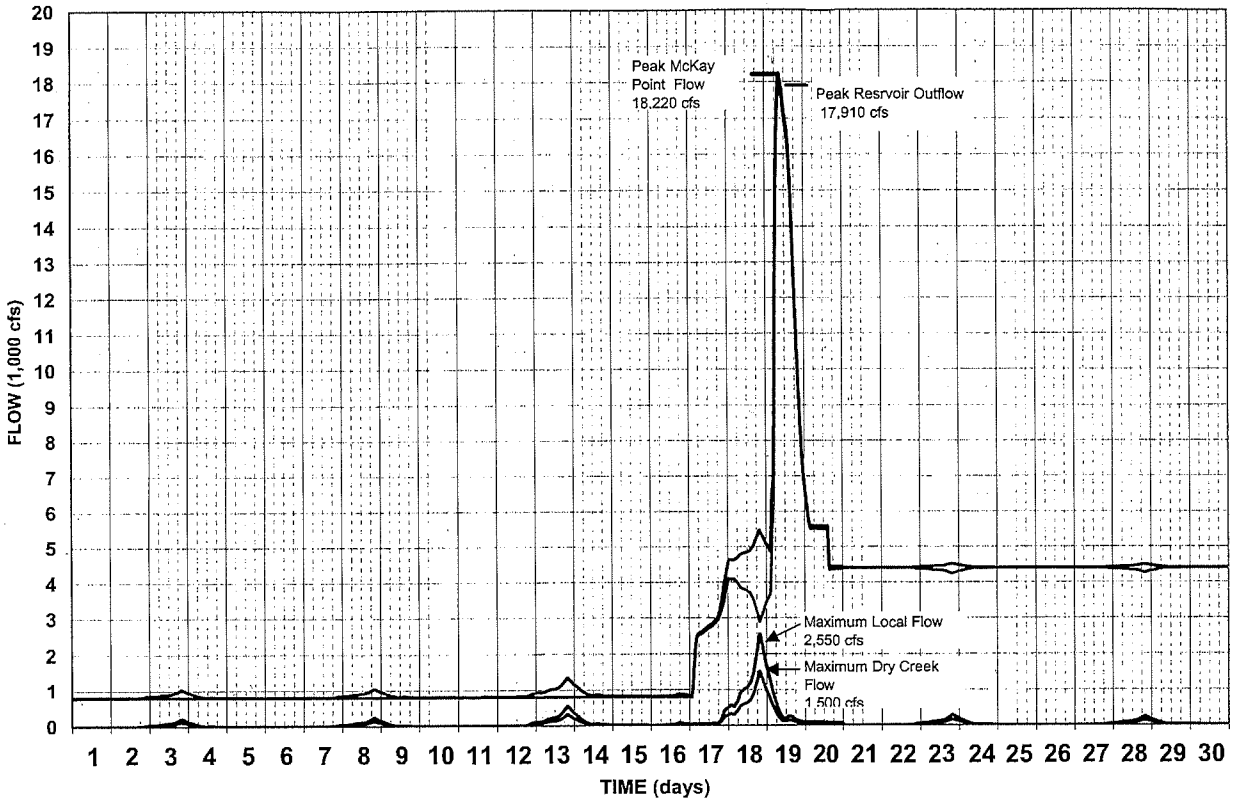
1 PERCENT

FLOOD ROUTING

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

Prepared by WLJ

Dec-03



TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

1 PERCENT

FLOOD ROUTING

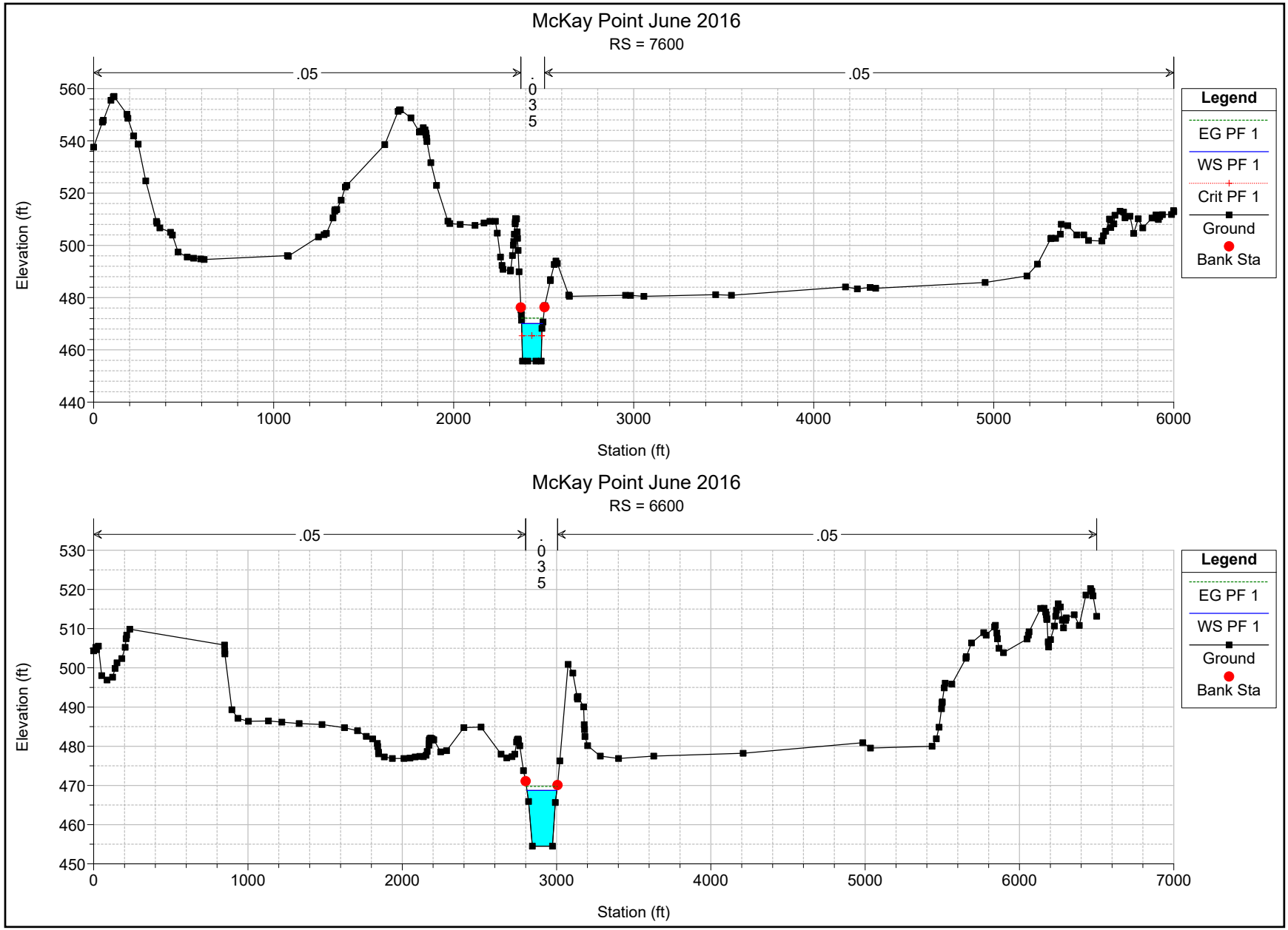
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

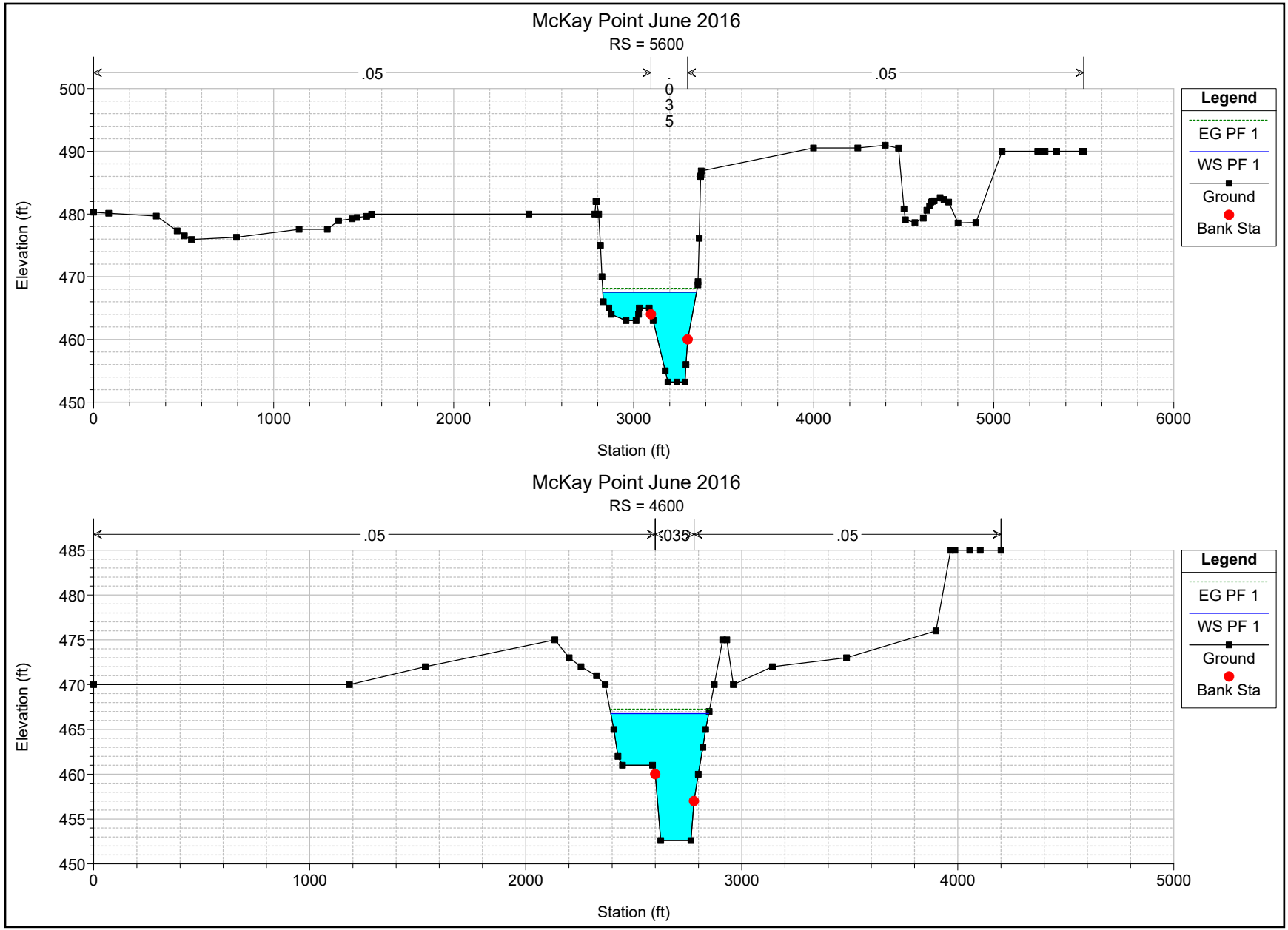
Prepared by WLJ

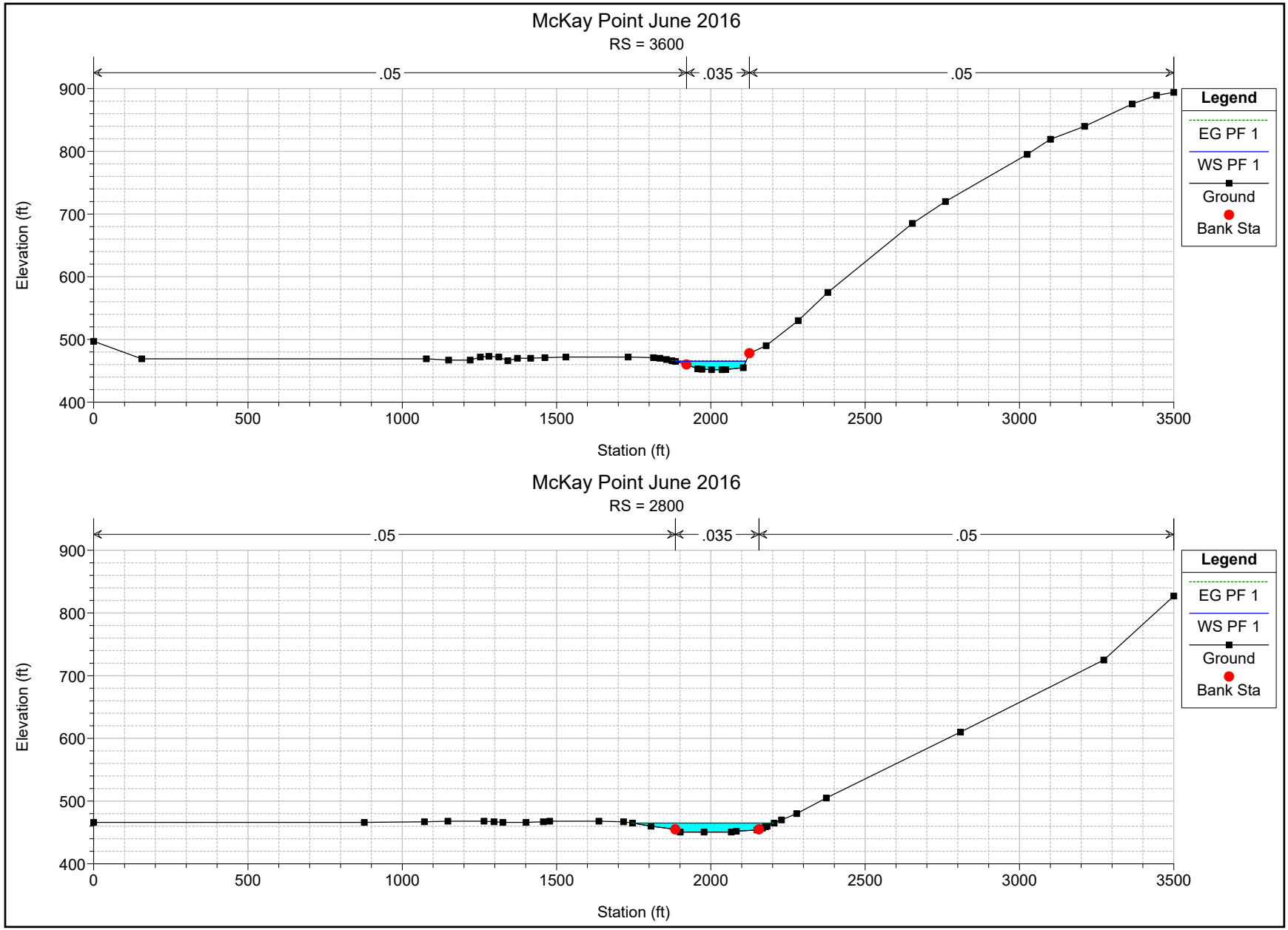
Dec-03

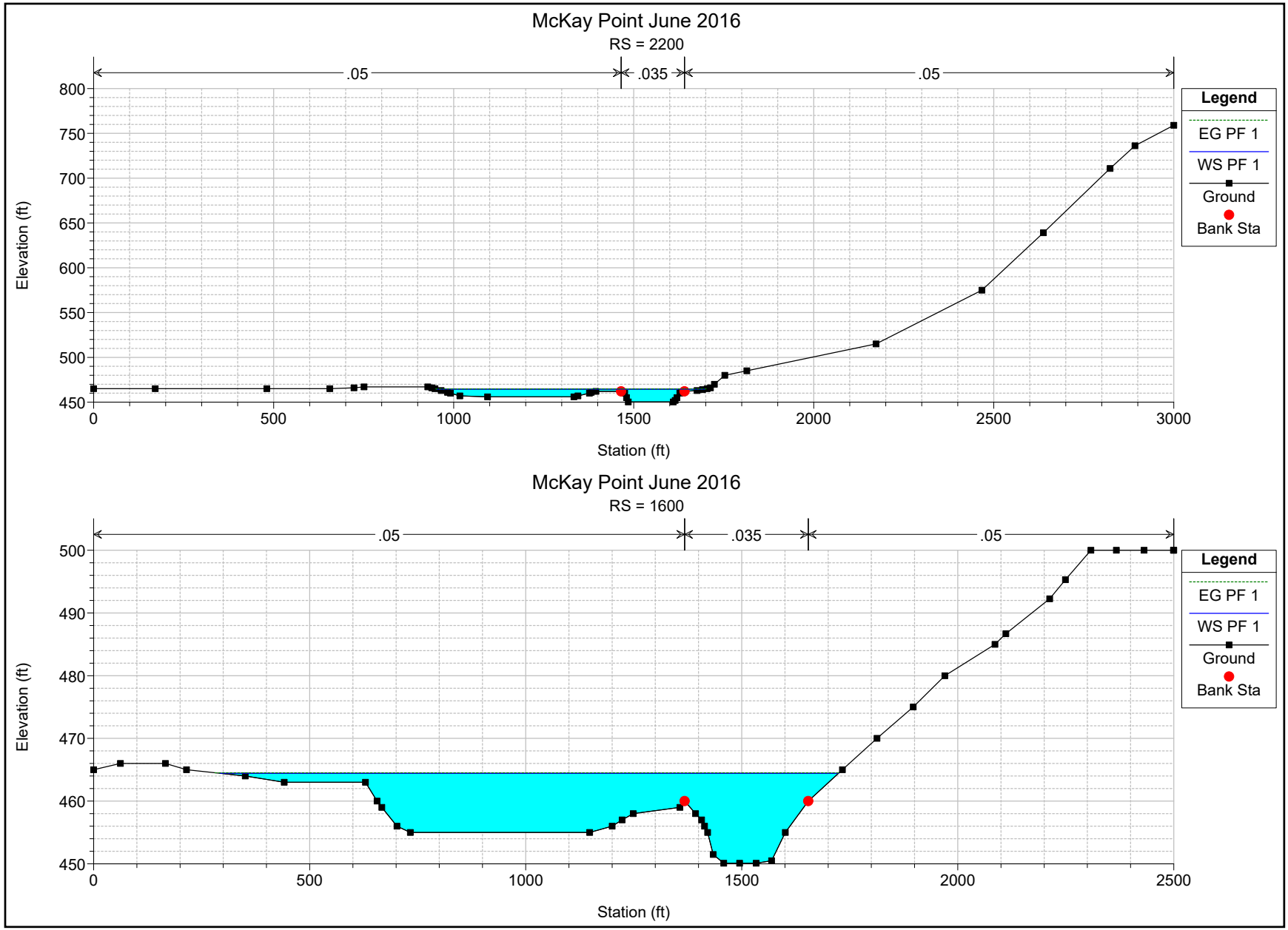
ATTACHMENT 2

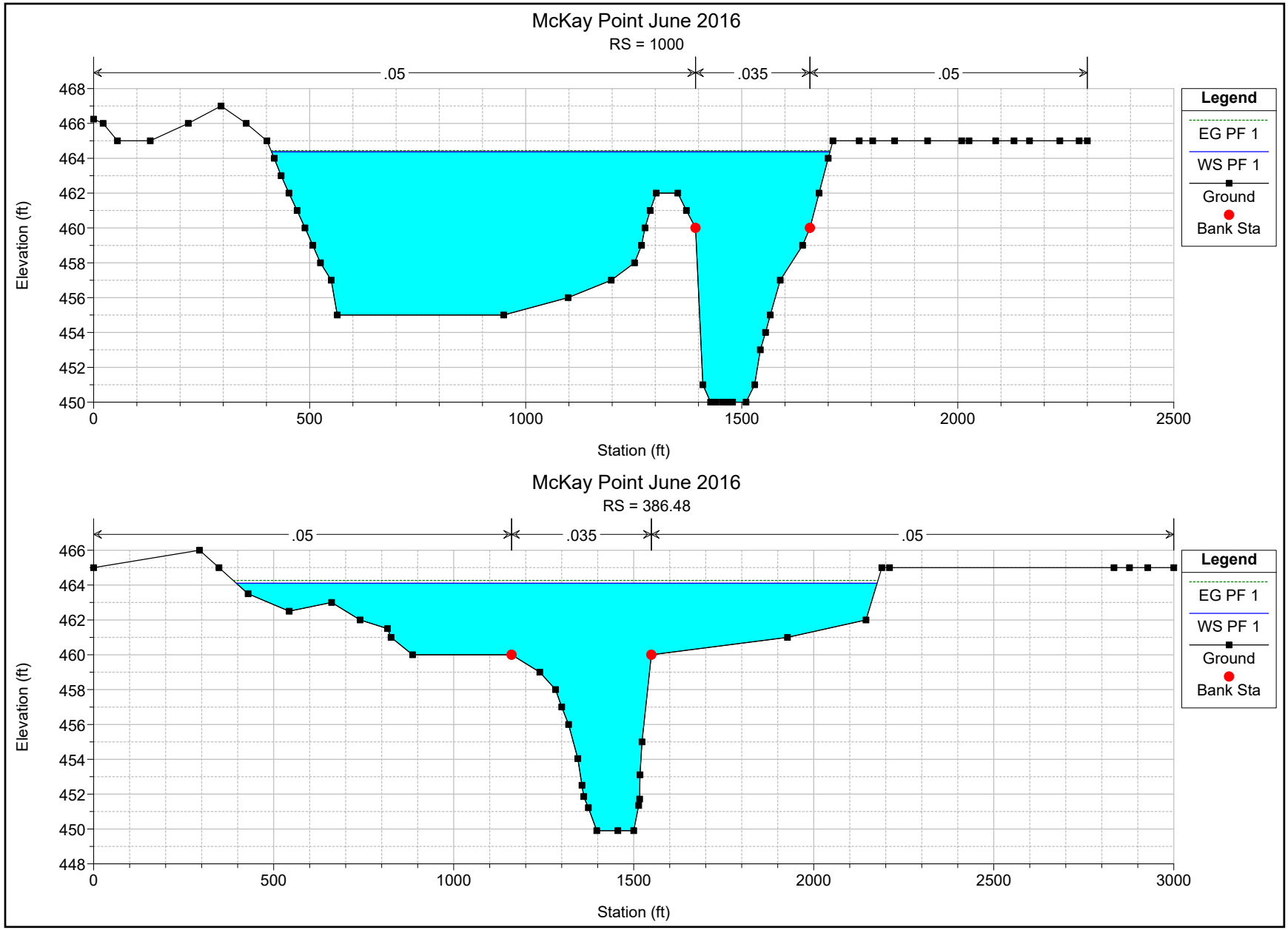
HEC-RAS RESULTS
PRE-PROJECT

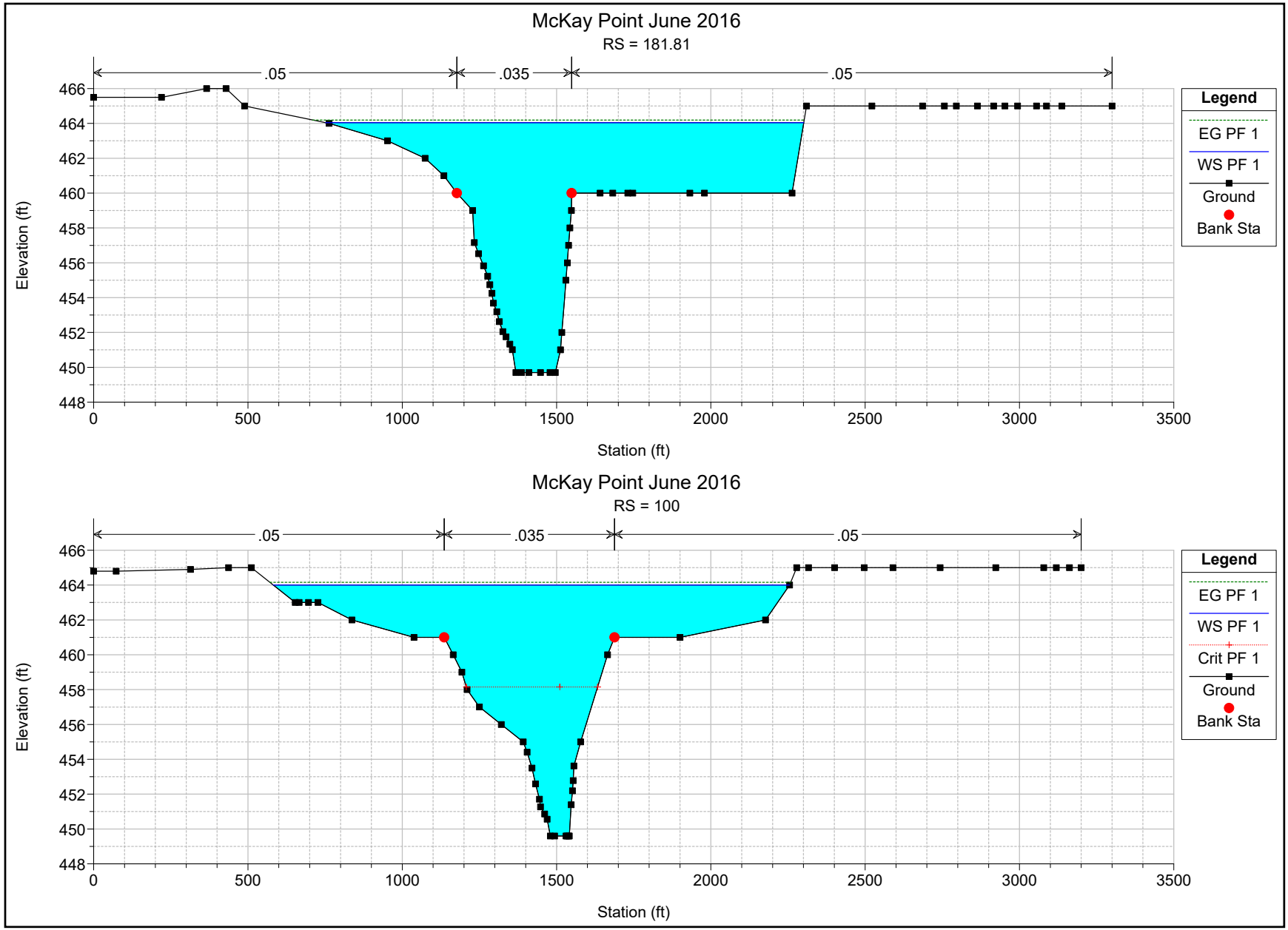

McKay Point June 2016
RS = 7600
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 6600
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 5600
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 4600
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 3600
.05
.035
.05
Elevation (ft)
900
800
700
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Station (ft)
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Ground
Bank Sta
McKay Point June 2016
RS = 2800
.05
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Elevation (ft)
900
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Station (ft)
Legend
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WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 2200
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.035
.05
Elevation (ft)
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EG PF 1
WS PF 1
Ground
Bank Sta
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2500
Station (ft)
Legend
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WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 1000
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.035
.05
Elevation (ft)
Station (ft)
Legend
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WS PF 1
Ground
Bank Sta
McKay Point June 2016
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Station (ft)
Legend
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Ground
Bank Sta

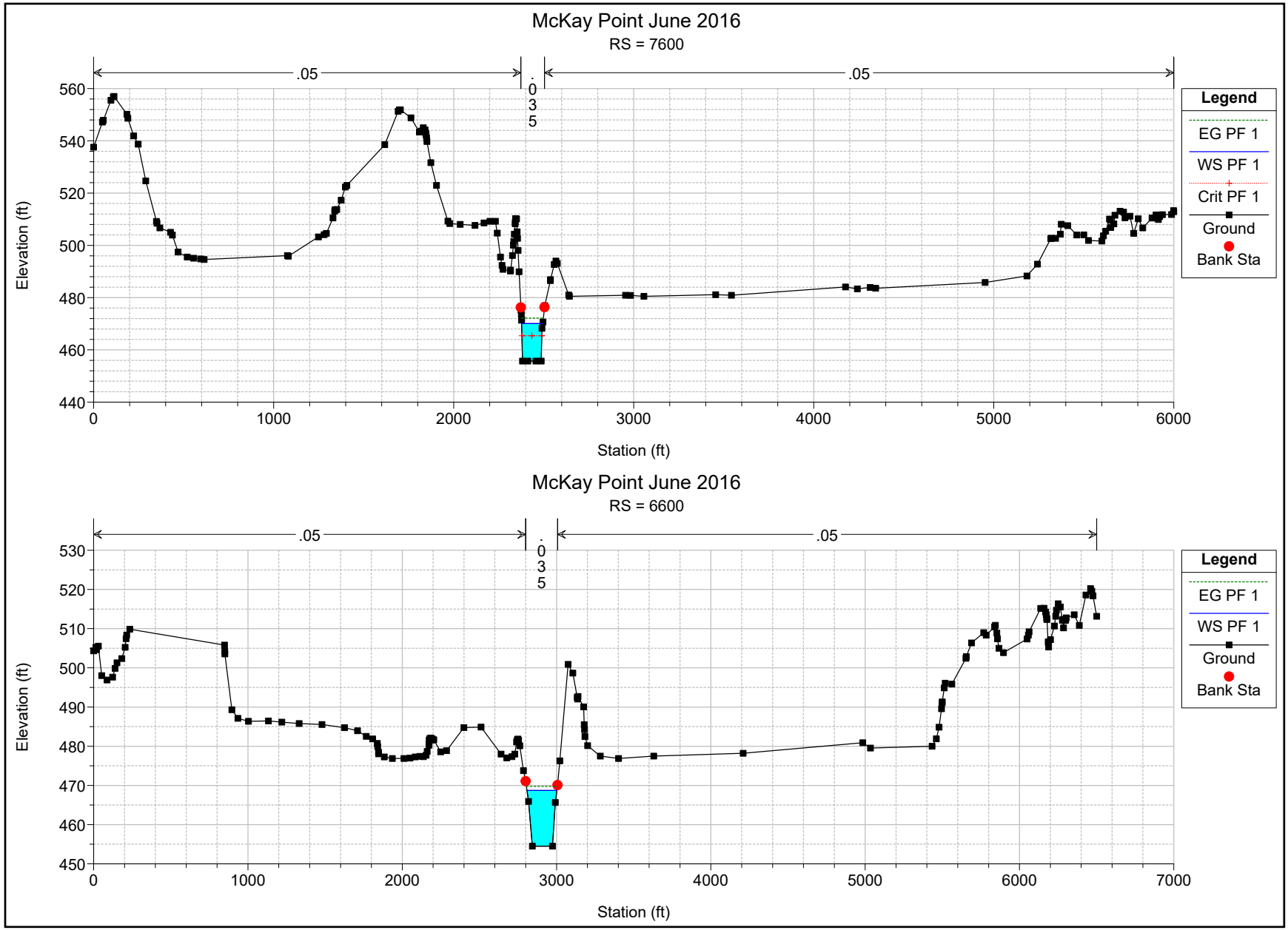

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Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 100
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Elevation (ft)
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Station (ft)
Legend
EG PF 1
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Crit PF 1
Ground
Bank Sta

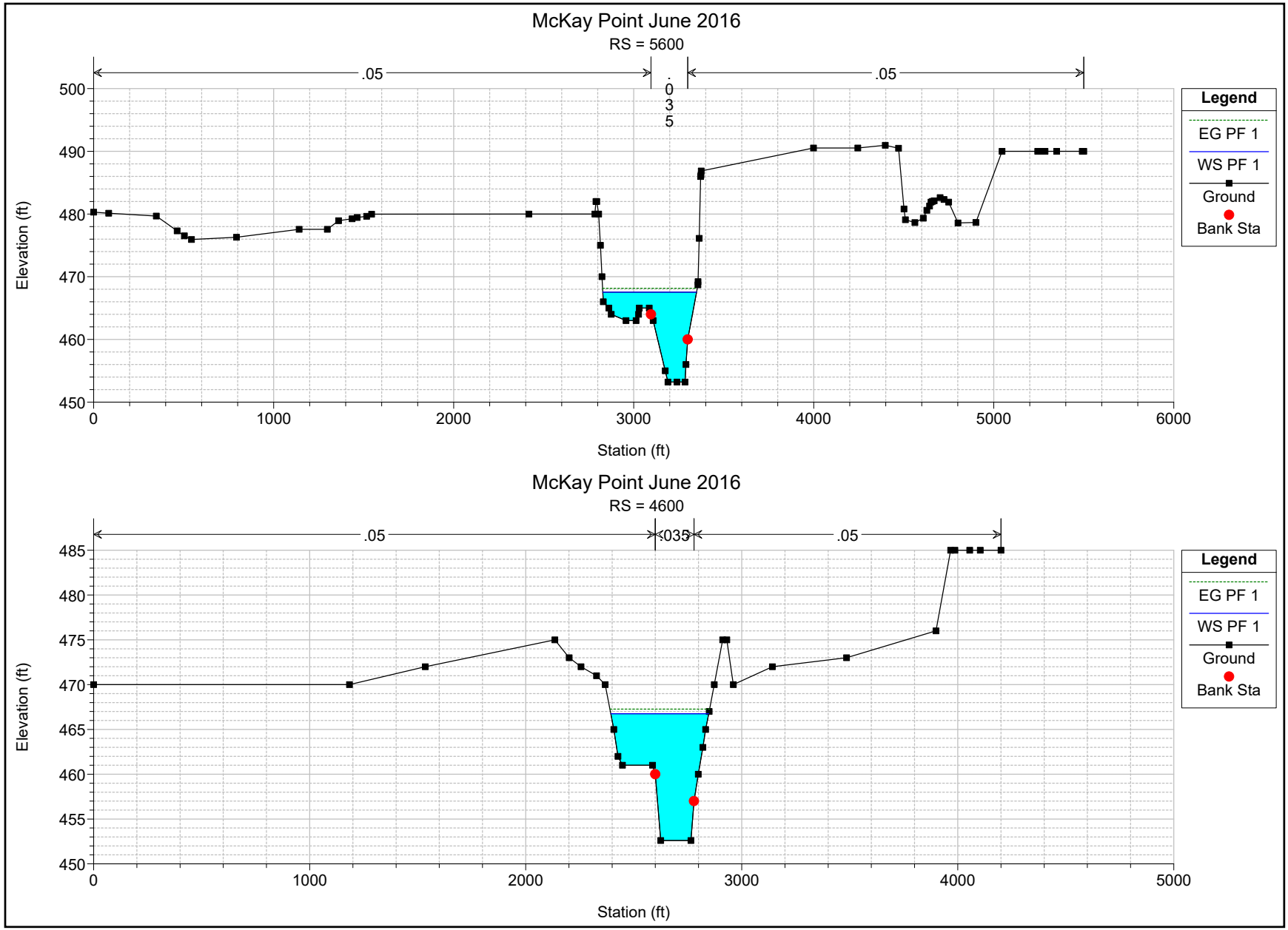
HEC-RAS Plan: Plan 04 River: E CREEK Reach: E Profile: PF 1

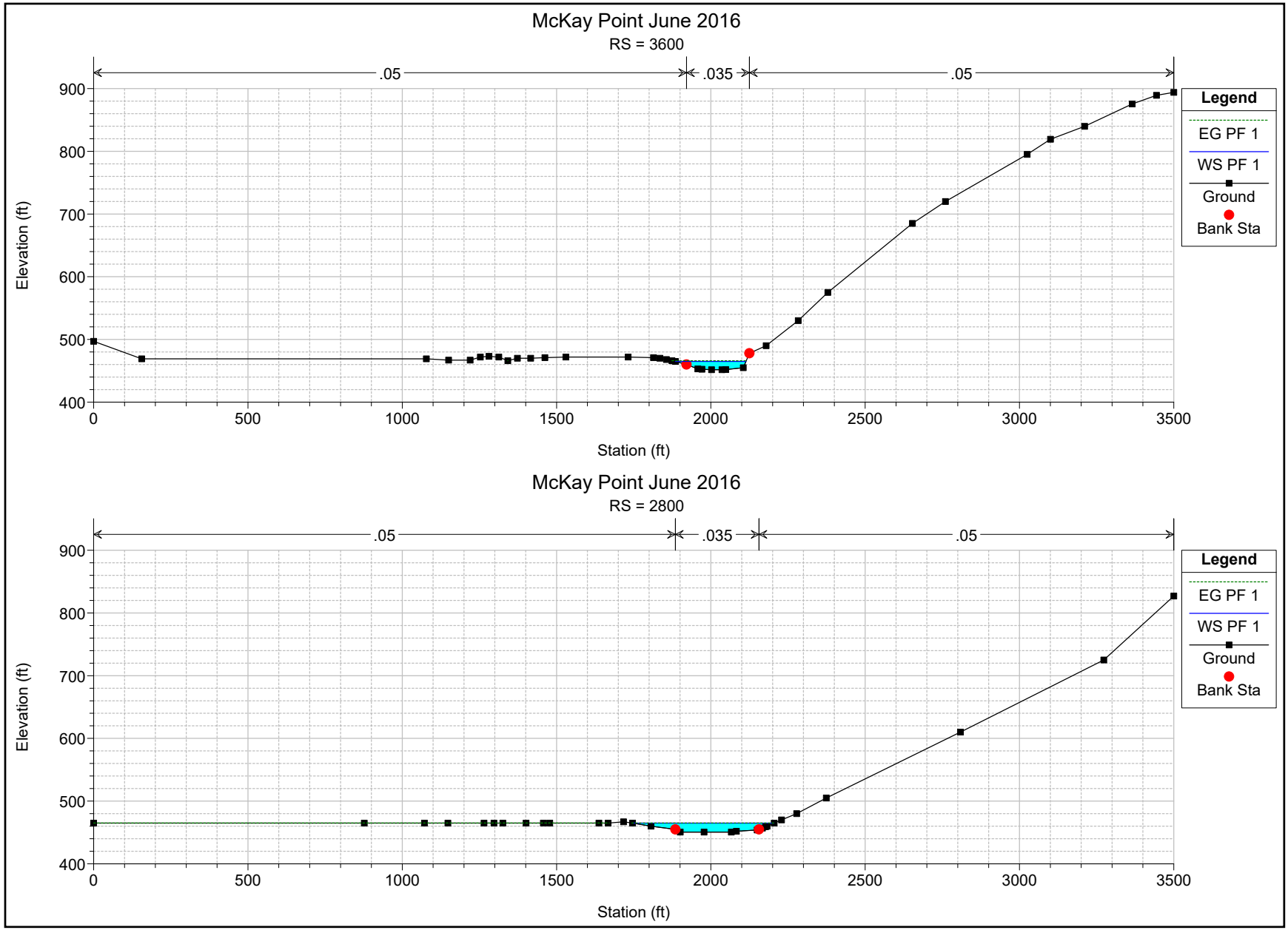
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E	7600	PF 1	18220.00	455.70	470.06	465.43	472.18	0.002941	11.67	1560.99	117.12	0.56
E	6600	PF 1	18220.00	454.50	468.73		469.75	0.001434	8.08	2254.41	193.60	0.42
E	5600	PF 1	18220.00	453.20	467.53		468.16	0.000990	6.75	3454.99	520.75	0.35
E	4600	PF 1	18220.00	452.60	466.76		467.27	0.000682	6.24	3802.28	453.17	0.30
E	3600	PF 1	18220.00	451.80	465.03		466.07	0.001534	8.24	2277.56	229.00	0.43
E	2800	PF 1	18220.00	450.60	464.88		465.18	0.000362	4.55	4613.07	457.03	0.22
E	2200	PF 1	18220.00	450.20	464.55		464.78	0.000474	4.77	5674.17	746.32	0.24
E	1600	PF 1	18220.00	450.10	464.43		464.52	0.000196	2.93	9761.29	1432.10	0.16
E	1000	PF 1	18220.00	450.00	464.37		464.44	0.000168	2.67	10183.60	1292.40	0.14
E	386.48	PF 1	18220.00	449.90	464.10		464.27	0.000383	3.71	7612.40	1779.54	0.21
E	181.81	PF 1	18220.00	449.70	464.04		464.20	0.000283	3.50	7605.83	1549.64	0.19
E	100	PF 1	18220.00	449.60	464.00	458.15	464.16	0.000371	3.39	7141.48	1673.00	0.21

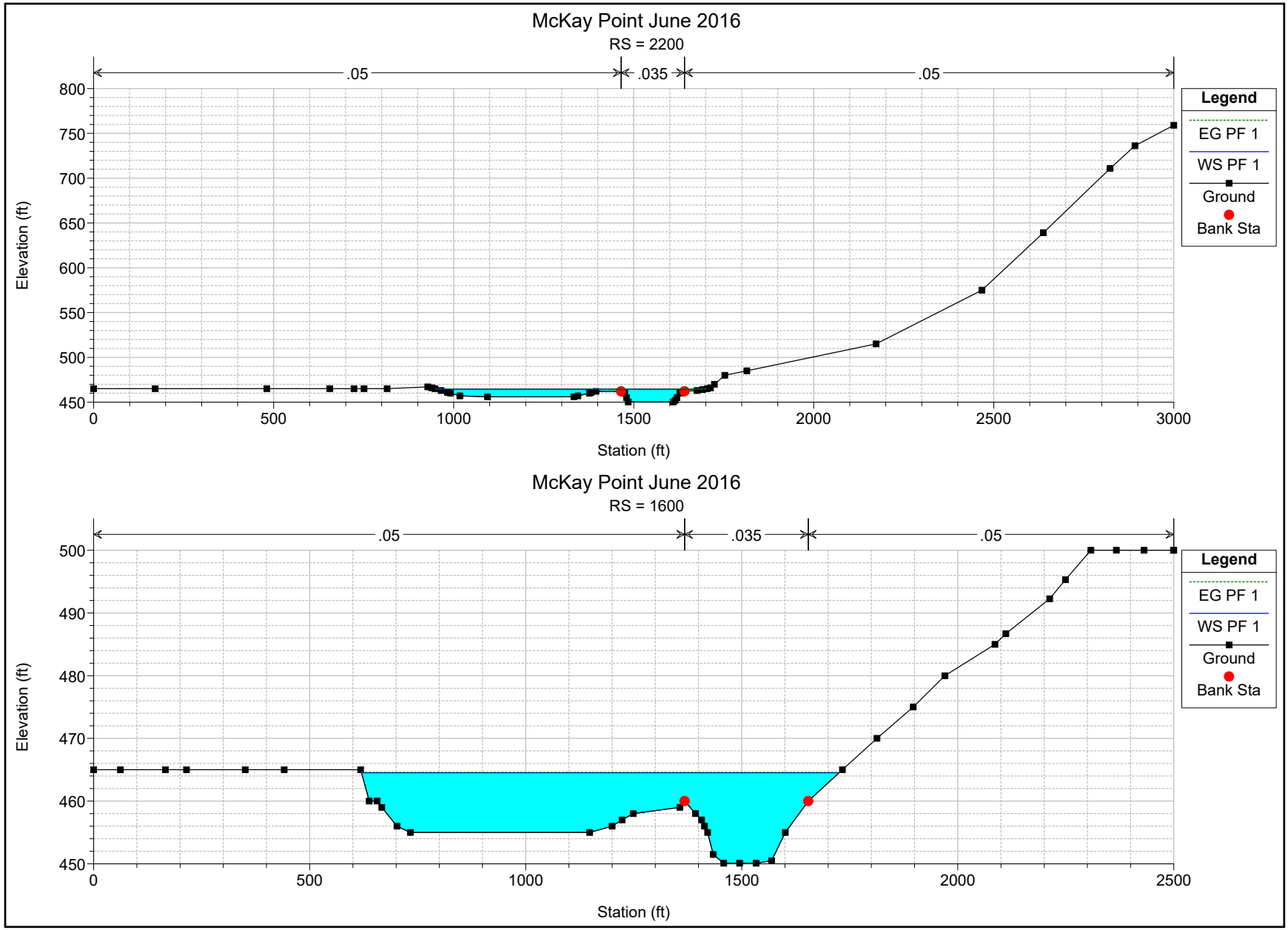
ATTACHMENT 3

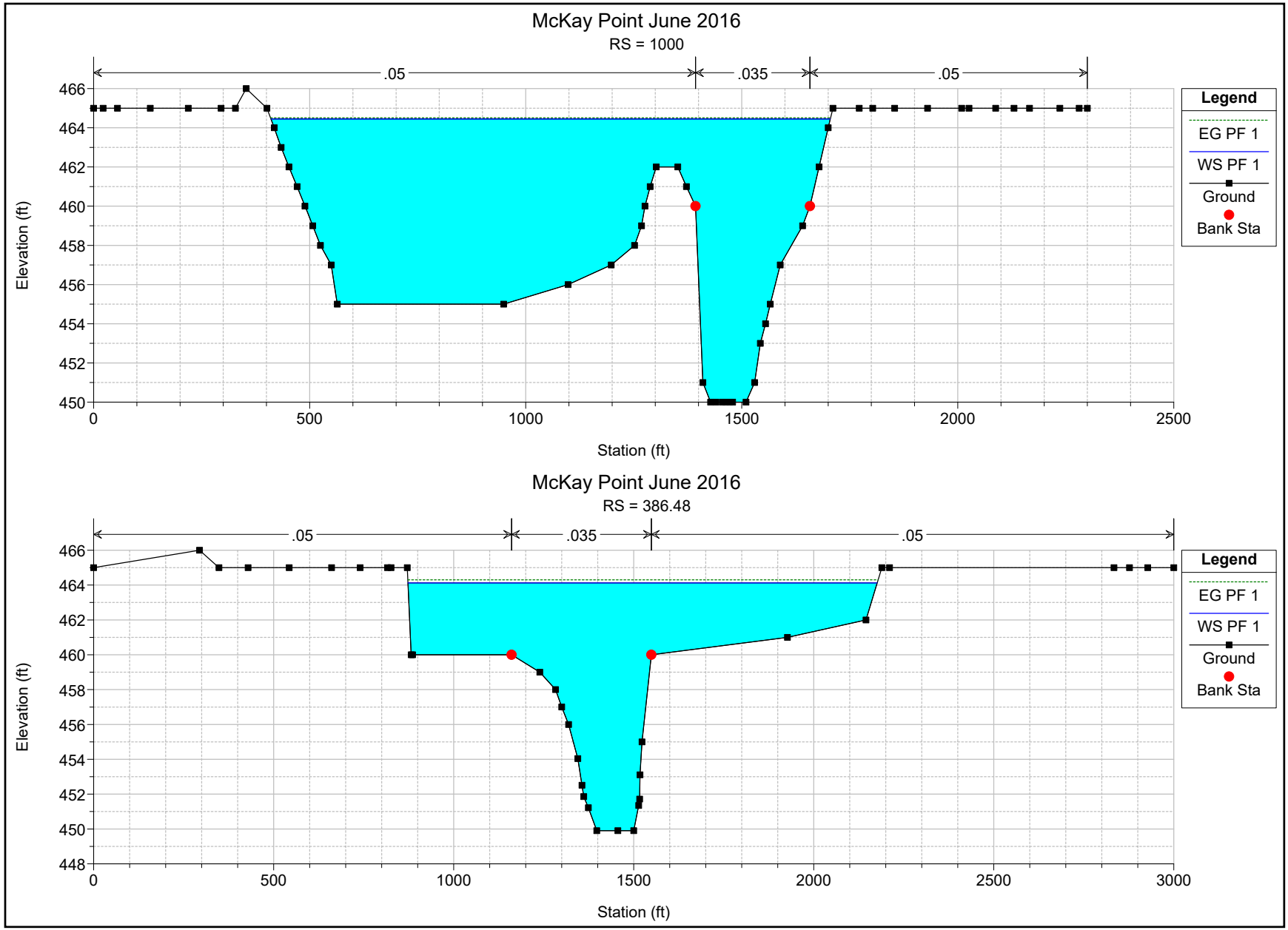
HEC-RAS RESULTS
POST-PROJECT

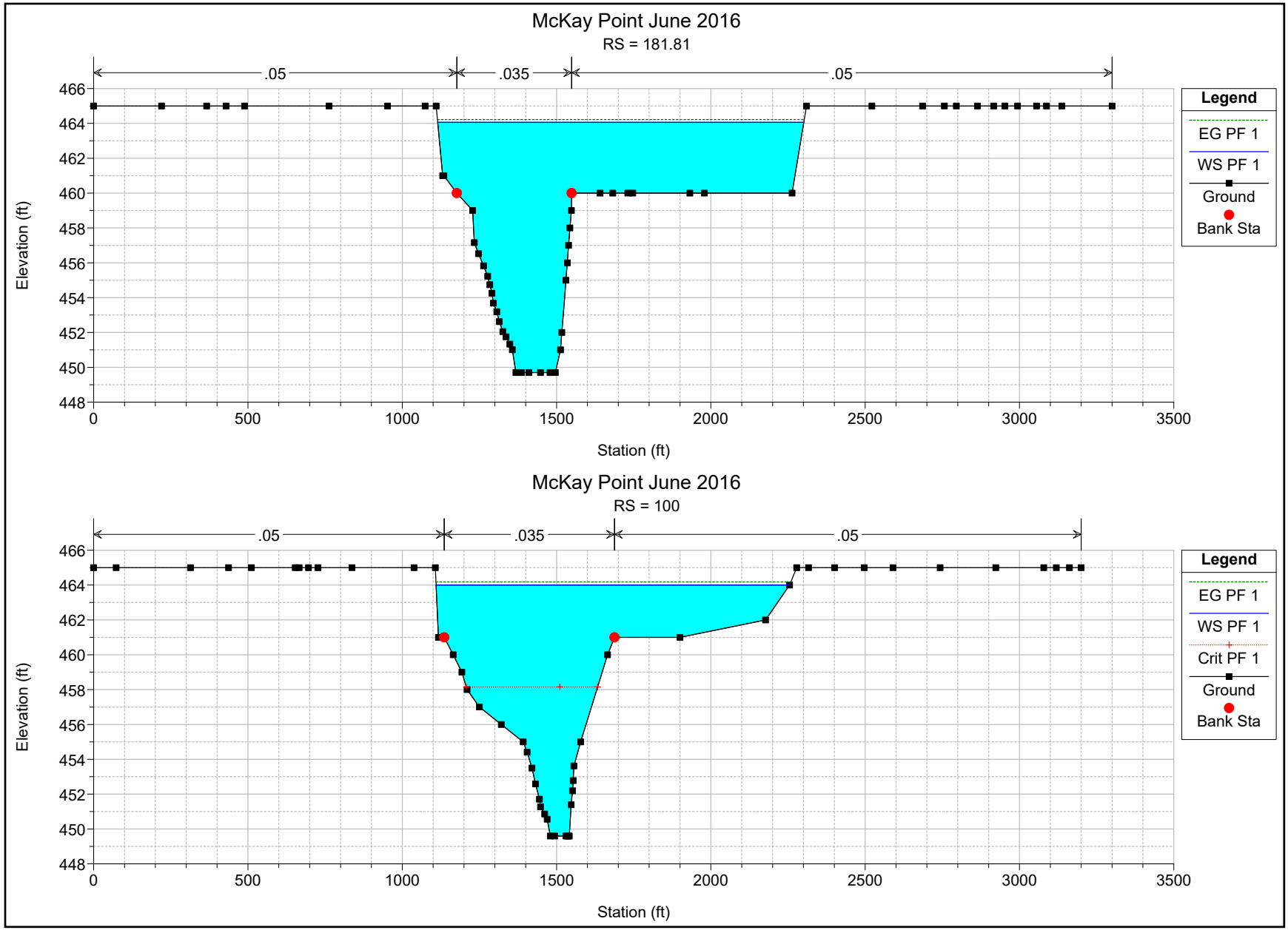

McKay Point June 2016
RS = 7600
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.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 6600
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 5600
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 4600
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 3600
.05
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Elevation (ft)
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Station (ft)
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Ground
Bank Sta
McKay Point June 2016
RS = 2800
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Elevation (ft)
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Station (ft)
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WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 2200
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Elevation (ft)
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Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 1600
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Elevation (ft)
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Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 1000
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 386.48
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta


McKay Point June 2016
RS = 181.81
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
McKay Point June 2016
RS = 100
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta

HEC-RAS Plan: Plan 03 River: E CREEK Reach: E Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E	7600	PF 1	18220.00	455.70	470.06	465.43	472.18	0.002942	11.67	1560.72	117.11	0.56
E	6600	PF 1	18220.00	454.50	468.73		469.74	0.001435	8.08	2253.66	193.57	0.42
E	5600	PF 1	18220.00	453.20	467.53		468.15	0.000992	6.76	3451.75	520.69	0.35
E	4600	PF 1	18220.00	452.60	466.75		467.27	0.000684	6.24	3798.63	453.04	0.30
E	3600	PF 1	18220.00	451.80	465.01		466.06	0.001540	8.25	2274.40	228.84	0.43
E	2800	PF 1	18220.00	450.60	464.87		465.16	0.000363	4.56	4606.13	456.78	0.22
E	2200	PF 1	18220.00	450.20	464.59		464.82	0.000468	4.75	5701.97	747.12	0.24
E	1600	PF 1	18220.00	450.10	464.52		464.59	0.000163	2.69	9525.45	1105.42	0.14
E	1000	PF 1	18220.00	450.00	464.45		464.51	0.000163	2.64	10279.92	1294.49	0.14
E	386.48	PF 1	18220.00	449.90	464.12		464.30	0.000399	3.79	6824.37	1303.21	0.22
E	181.81	PF 1	18220.00	449.70	464.06		464.22	0.000286	3.52	7222.06	1186.29	0.19
E	100	PF 1	18220.00	449.60	464.00	458.15	464.18	0.000409	3.56	6138.73	1145.50	0.22

ATTACHMENT 4

RIVERBED ANALYSIS

Written by: SB Date: 2016 / 06/ 24 (YY MM DD) Reviewed by: TP Date: 2016 / 06/ 24 (YY MM DD)

Client: SESPE Project: McKay Point Reservoir Project No: 117.00981 Task No.: 01

RIVERBED ANALYSIS

MCKAY POINT RESERVOIR, CALIFORNIA

1. PURPOSE AND SCOPE

This attachment documents the riverbed analysis conducted for the Kaweah River and the St. Johns River at the proposed McKay Point Reservoir Project site. The McKay Point Reservoir Project involves the creation of a topographic depression that will capture precipitation and some storm water runoff. The Project will not involve placing structures in the St. Johns or Kaweah River channels and will not alter the course of either river. The only changes to the river channels will be placement of rip rap at the Inflow and Outflow Channels, and construction of the Inflow and Outflow Channels. The rip rap will be placed below the elevation of the main river channels, and the Inflow/Outflow Channels will be set back from the main river channels. These structures are designed to avoid impedance of river flows.

2. ANALYSIS

SLR reviewed historical aerial photos of the riverbeds of the Kaweah and St. Johns Rivers and the surrounding areas. The aerial photos from the years 1954, 1956, 1969, 1974, 1984, 1989, 1994, and 2002 were obtained from Environmental Data Resources, Inc. (EDR, 2014). The aerial photos from the years 2003, 2004, 2005, 2006, 2009, 2010, 2011, 2012, and 2014 were obtained from Google Earth. The photos were reviewed to determine if major scouring or changes to the morphology of the Kaweah and St. Johns Rivers had occurred near the McKay Point Reservoir Project site in the past. The 1954 and 1956 photos show that the size and shape of the river channels varied with the weather conditions and the corresponding flow volumes that occurred at the time. However, starting with the 1969 photo, no significant changes can be observed. Terminus Dam was constructed in 1962, and regulates flows and flooding, and thus river morphology and scouring. Rapid changes in river morphology and scouring have therefore been minimized. Terminus Dam is used extensively to manage flow rates in the rivers and to avoid flow rates that would result in extensive scouring.

3. SUMMARY AND CONCLUSIONS

SLR has conducted a review of historical aerial photographs of the McKay Point Reservoir Project site and the surrounding areas to identify whether the Kaweah and St. Johns Rivers have moved or changed course significantly in the past sixty years. The results of this riverbed analysis are presented in a series of figures in which the 2014 aerial image is overlaid by sketches of the historical outlines of the river channels from the selected years of 1956, 1969,

1974, 1984, 1994, 2002, 2005, and 2014. Based on this evaluation, SLR concludes that the riverbeds of the Kaweah and St. Johns Rivers have not moved significantly since construction of Terminus Dam in 1962.

It is anticipated that during reservoir operations, flow rates in the St. Johns and Kaweah Rivers will remain within the existing range of typical flow rates that are currently managed through outflows of Terminus Dam. Use of the reservoir for flood storage may actually cause flow rates in the Kaweah and St. Johns Rivers to decrease during periods of high precipitation, thereby reducing scour potential. Thus, SLR also concludes that the riverbeds of both the Kaweah and St. Johns Rivers would not move as a result of the McKay Point Reservoir Project.

4. REFERENCES

Environmental Data Resources, Inc. (EDR), 2014, The EDR Aerial Photo Decade Package – McKay Point Reservoir Project, Inquiry Number: 4044498.5, August 26.

Federal Emergency Management Agency (FEMA). Flood Insurance Study Tulare County, California and Incorporated Areas. June 2009.

Kaweah and St. Johns Rivers Association (Watermaster), 1991-2007, Annual Report.

ATTACHMENT D

SEEPAGE CALCULATIONS

DRAFT

D.1 INTRODUCTION

Seepage calculations were performed to determine the amount of groundwater inflow into the excavated reservoir, both with and without the proposed slurry wall. These analyses were conducted using two methods, i.e.:

- Simplified Two-dimensional (2-D) analyses; and
- A conceptual level Three-dimensional (3-D) analysis as a check on the 2-D modleing and also to assess the likely impacts of the project on the groundwater levels surrounding the Reservoir.

Tw sets of analyses were performed as a check on the range of potential values that could be generated. The details of the modeling work and the results are provided in Sections D.2 and D.3 bellow. The overall key results are as follows:

Table D1-1 Summary of Excavation and Reservoir Inflow Rates

PROJECT STAGE	CONDITIONS	SLURRY WALL	INFILTRATION TRENCH	2-D MODELLING (GPM)	3-D MODELLING (GPM)	RECOMMENDED FOR USE IN ENVIRONMENTAL ANALYSES (GPM)	RATIONAL
Excavation / Reservoir	Final Excavation Empty Reservoir	No	No	0	0	0	
	Initial Excavation Full Reservoir	No	No	659	830	800	Reasonable average value
	Final Excavation Empty Reservoir	Yes	No	0	0	0	
	Initial Excavation Full Reservoir	Yes	Yes	220	74-174[1]	220	More conservative value

NOTES: (1) Depending on the depth of penetration of the slurry wall

Table D1-2 Summary of Impacts to Surrounding Groundwater Levels (Based on 3-D Groundwater Flow Modeling)

PROJECT STAGE	CONDITIONS	SLURRY WALL	INFILTRATION TRENCH	MAXIMUM GROUNDWATER LEVEL IMPACTS (FEET) MODELED UP TO 500 FEET FROM THE SLURRY WALL (OR EDGE OF EXCAVATION)		
				UPSTREAM / EAST	NORTH	DOWNSTREAM / WEST
Excavation / Reservoir	Final Excavation Empty Reservoir	No	No	-14 to -24	-49 to -52	-28 to 44
	Initial Excavation Full Reservoir	No	No	0	0	0
	Final Excavation Empty Reservoir	Yes	Yes	0	--2	-3
	Initial Excavation Full Reservoir	Yes	Yes	0	0	0

D.2 TWO DIMENSIONAL ANALYSES

D.2.1 INTRODUCTION

Two geologic cross sections across the reservoir were developed based on the boring logs available and a review of available information about the site. These two geologic cross sections are presented in Attachment A of the Technical Memorandum prepared by SES (SES, 2012). Based on these geologic cross sections and the layout of the reservoir developed by Provost and Pritchard (February 18, 2014), three representative cross sections were developed for seepage analysis. The locations of the three cross sections are shown on Figure D2-1. Each cross section represents the geologic conditions, width of the reservoir, and the hydrogeologic regime in the various areas of the reservoir. The depth of the reservoir at each cross section was taken from the layout developed by Provost and Pritchard.

The seepage analyses consist of evaluating the flow of water into the reservoir during and at the end of excavation. The analyses are performed for the following three scenarios:

1. The first scenario considered construction of the reservoir (i.e. excavation) without a perimeter slurry wall;

2. The second scenario includes a slurry wall installed around the perimeter of the reservoir approximately 50 ft away from the crest of the slopes and extending down to elevation 388 ft above mean sea level (amsl); and

3. The third scenario consists of augmenting scenario two by adding a reinjection/recirculation trench north of the slurry wall to recirculate influent water back into the natural groundwater system.

The seepage analyses presented in this attachment were performed with the finite element programs SEEP/W (GeoStudio, 2012).

D.2.2 REPRESENTATIVE SECTIONS

D.2.2.1 SECTION 1

This section runs north to south and combines the information from geologic cross sections AA' and BB' (Attachment A in SES 2012) with an emphasis on the conditions observed at Boring B-1. Boring B-1 indicates a lack of the bedrock horizon unit that was observed at other boring locations. Consequently, groundwater flow underneath the reservoir will be within the SC/CL layer. Also, this section of the reservoir is triangular rather than trapezoidal.

D.2.2.2 SECTION 2

This section runs north to south and again combines the information from geologic cross sections AA' and BB' with emphasis on the conditions observed at Boring B-2. Boring B-2 indicates a lack of the bedrock horizon unit that was observed at other boring locations. Also, this section of the reservoir was modeled as a trapezoid.

D.2.2.3 SECTION 3

This section again runs from north to south and combines information from geologic cross sections AA' and BB' with an emphasis on the conditions observed at Borings B-3 and B-4. Borings B-3 and B-4 indicate a bedrock horizon existing at the final depth of excavation along with SC/CL and SP lenses. Also, this section of the reservoir was modeled as a trapezoid.

D.2.3 MATERIAL PROPERTIES

The hydraulic conductivities of the different stratigraphic layers were calculated using the results of the geotechnical testing carried out on samples recovered from the borings. A series of grain size analyses (ASTM D422) were performed on samples collected in the borings. The results of these tests were used together with correlations such as those developed by Hazen (1852, 1911), Kozeny (1927) and Carman (1938, 1956) to determine hydraulic conductivities. The details of the analyses are provided in Attachment B of SES (2012). The values estimated by SES were compared to those measured by Fugro (2002) at a nearby site and the values of transmissivity reported by Luhdorff and Scalmanini (1995) for a site west of the project site.

The hydraulic conductivity of the slurry wall is very low and a conductivity value was set based on engineering judgement. The selected hydraulic conductivity of the slurry wall is 3.3×10^{-11} ft/sec (1×10^{-9} cm/s).

The values of isotropic saturated hydraulic conductivities used in the analyses are presented in Table D2-1.

Analyses were performed considering isotropic as well as anisotropic conditions for the alluvium. This is the ratio of the horizontal to the vertical saturated hydraulic conductivity. Both conditions were analyzed as a sensitivity analysis to address the uncertainty in the depositional nature of the alluvium/unconsolidated materials in the upper layers. A coefficient of anisotropy of 5 was used. This coefficient was not applied to the bedrock or the slurry wall.

D.2.4 BOUNDARY CONDITIONS

The boundary conditions for the analysis were established based on the location of the reservoir with respect to the Kaweah River to the south, and the CEMEX ponds (former pits) north of the proposed reservoir.

D.2.4.1 CROSS SECTION 1

This section is the furthest from the Kaweah River at approximately 2,340 ft, and is not affected by its regime. The water table in Boring B-1 was observed at elevation 438 ft amsl. In their report, Luhdorff and Scalmanini have established that the ephemeral nature of the Saint Johns River has no significant effect on the water table in the area. Therefore, the southern boundary condition was set as a constant head of 438 ft amsl at a distance 2,340 ft south of the reservoir. For the northern boundary conditions, the groundwater elevations from Figure 6 of Kenneth Schmidt and Associates (November-December, 2011) were used. The groundwater elevation on the northern boundary was set at an elevation of 438 ft amsl 1000 feet north of the reservoir.

D.2.4.2 CROSS SECTION 2

Groundwater elevations in Borings B-5 and B-2 were used to establish the boundary in terms of total head for the north and south end of this section. The northern boundary condition was set at a constant head of 445 ft amsl at a distance 1000 ft north of the reservoir, and the boundary condition on the south was set as a constant head of 445 ft amsl at a distance 1,780 ft south of the reservoir.

D.2.4.3 CROSS SECTION 3

Section 3 is the most influenced by the Kaweah River. The groundwater elevation in Boring B-6 was used to establish the boundary conditions for the south end of this section and the groundwater elevation Figure 6 of Kenneth Schmidt and Associates was used for the north end of the section. The northern boundary condition was set as a constant head equal to 452 ft amsl at a distance 1000 ft north of the reservoir, whereas the southern boundary condition was set as a constant head of 460 ft amsl at a distance 370 ft south of the reservoir.

D.2.4.4 RADIUS OF INFLUENCE

The radius of influence for the alluvium typical of the area was established in the pump test performed by Luhdorff and Scalmanini. The radius of influence is on the order of 1,000 ft. Consequently, the model's boundary conditions were set at a minimum of 1,000 ft from the edges of the reservoir when applicable. This minimum of 1,000 ft was utilized for the southern boundaries of Sections 1 and 2. However, the southern boundary condition of Section 3 was exempt from the 1,000 ft minimum distance, as the edge of the reservoir is approximately 370 ft from the Kaweah River.

D.2.5 RECIRCULATION / REINJECTION OF INFLUENT GROUNDWATER

Scenario three utilizes an injection/recirculation trench to recirculate all influent water from the excavation back into the natural groundwater system. This injection/recirculation trench was modeled to have dimensions of 3 ft wide by 10 ft deep, and was assigned a material conductivity of $1x10^{-2}$ ft/sec (0.3 cm/sec). The injection/recirculation trench was placed 10 ft north of the slurry wall for scenario three.

As groundwater enters the excavation, it will be pumped into the injection/recirculation trench. The water added to the natural groundwater system from the injection/recirculation trench will consequently increase the flux into the excavation, thus requiring slightly greater pumping into the injection/recirculation trench to keep the excavation unsaturated. Groundwater inflow and required injection/recirculation rates will continue to rise as excavation proceeds, and must be accommodated for.

D.2.6 RESULTS

Analyses were performed for each scenario at each cross section using the representative values of saturated hydraulic conductivity listed in Table D2-1 for each formation assuming either isotropic or anisotropic conditions in the alluvium.

D.2.6.1 FLOWS AT EACH SECTION

The three sections analyzed are shown on Figures D2-2 through D2-4 for scenario one (no slurry wall), D2-5 through D2-7 for the scenario two (slurry wall), and D2-8 through D2-10 for scenario three (slurry wall and reinjection/recirculation). The results in the form of the pressure head and flux into the reservoir are shown on Figures D2-11 through D2-13 for scenario one, D2-14 through D2-16 for scenario 2, and D2-17 through D2-19 for scenario three.

The results for anisotropic conditions are similar, so are not shown herein. The results for isotropic versus anisotropic conditions indicate that the uncertainty in isotropy isn't a determining factor in the results.

The results are presented in Table D2-2 as the flow into the excavation in cubic feet per second (ft^3/s) and gallons per minute (gpm) for each representative section and each scenario analyzed.

D.2.6.2 TOTAL FLOW INTO RESERVOIR

The total flows into the reservoir were evaluated for each scenario by a weighted average of the length of reservoir perimeter best represented by each of the three sections. Those weighting lengths were established based on review of the geologic conditions, width of the reservoir, and the boundary conditions of each section. The lengths of pit modeled by each of the representative cross sections were established as:

- Section 1: 1,600 ft;
- Section 2: 2,200 ft; and
- Section 3: 2,000 ft.

For a total length of 5,800 ft.

The total flows into the reservoir for each scenario are reported in Table D2-3.

Table D2-1: Hydraulic Conductivity Values

LAYER #	SOIL DESCRIPTION	SOIL TYPE	K (cm/s)	K (ft/s)
1	Poorly Graded Sand	SP	$1.6x10^{-3}$	$5.3x10^{-5}$
2	Poorly Graded Gravel	GP	$2.3x10^{-2}$	$7.4x10^{-4}$
3	Silty Sand/Clayey Sand	SM-SMC	$5.2x10^{-5}$	$1.7x10^{-6}$
4	Sandy Clay/Low Plasticity Clay	SC/SM	$1.5x10^{-6}$	$5.0x10^{-8}$
5	Low Plasticity Clay	CL	$5.0x10^{-7}$	$1.5x10^{-8}$
6	Bedrock	–	$1.0x10^{-4}$	$3.3x10^{-6}$

Table D2-2: Flow into Reservoir at Each Representative Cross Section

Section Condition	Flux (ft3/sec/ft)	Flux (gpm/ft)
Scenario 1		
Section 1 Isotropic	9.59E-05	0.0430
Section 1 Anisotropic	9.53E-05	0.0428
Section 2 Isotropic	1.62E-04	0.0727
Section 2 Anisotropic	1.71E-04	0.0767
Section 3 Isotropic	4.40E-04	0.1975
Section 3 Anisotropic	4.70E-04	0.2109
Scenario 2		
Section 1 Isotropic	7.97E-06	0.0036
Section 1 Anisotropic	1.23E-05	0.0055
Section 2 Isotropic	2.47E-05	0.0111
Section 2 Anisotropic	4.07E-05	0.0183
Section 3 Isotropic	8.54E-05	0.0383
Section 3 Anisotropic	9.35E-05	0.0420
Scenario 3		
Section 1 Isotropic	1.210E-05	0.0054
Section 1 Anisotropic	2.430E-05	0.0109
Section 2 Isotropic	3.860E-05	0.0173
Section 2 Anisotropic	7.500E-05	0.0337
Section 3 Isotropic	1.130E-04	0.0507
Section 3 Anisotropic	1.430E-04	0.0642

Table D2-3: Total Flows into Reservoir

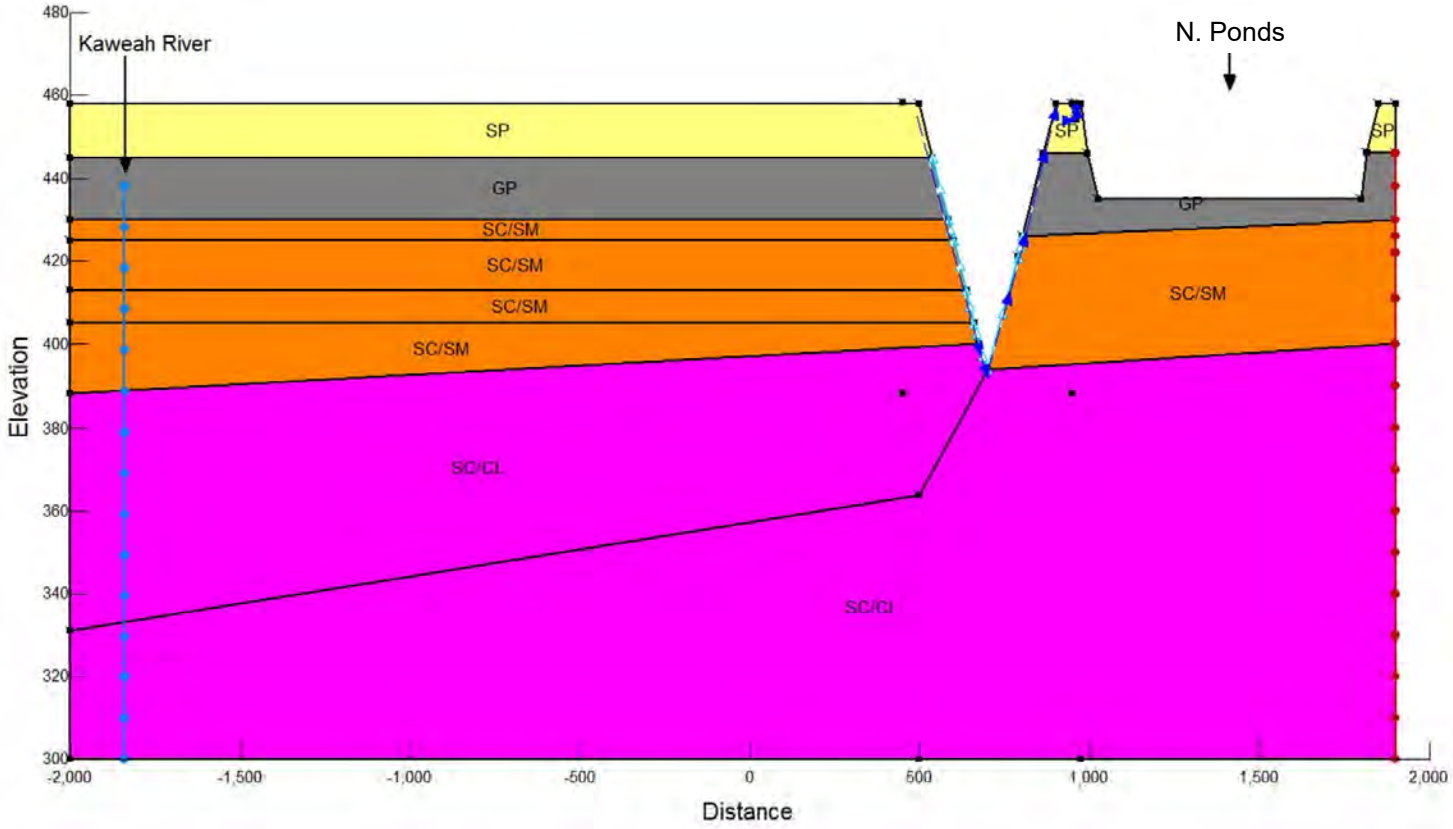
Condition	Flux (ft3/sec)	Flux (gpm)
Scenario 1		
Isotropic	1.390E+00	624
Anisotropic	1.469E+00	659
Scenario 2		
Isotropic	2.379E-01	107
Anisotropic	2.962E-01	133
Scenario 3		
Isotropic	3.303E-01	148
Anisotropic	4.899E-01	220

FIGURES

Figure D2-1: Layout of the Proposed Reservoir

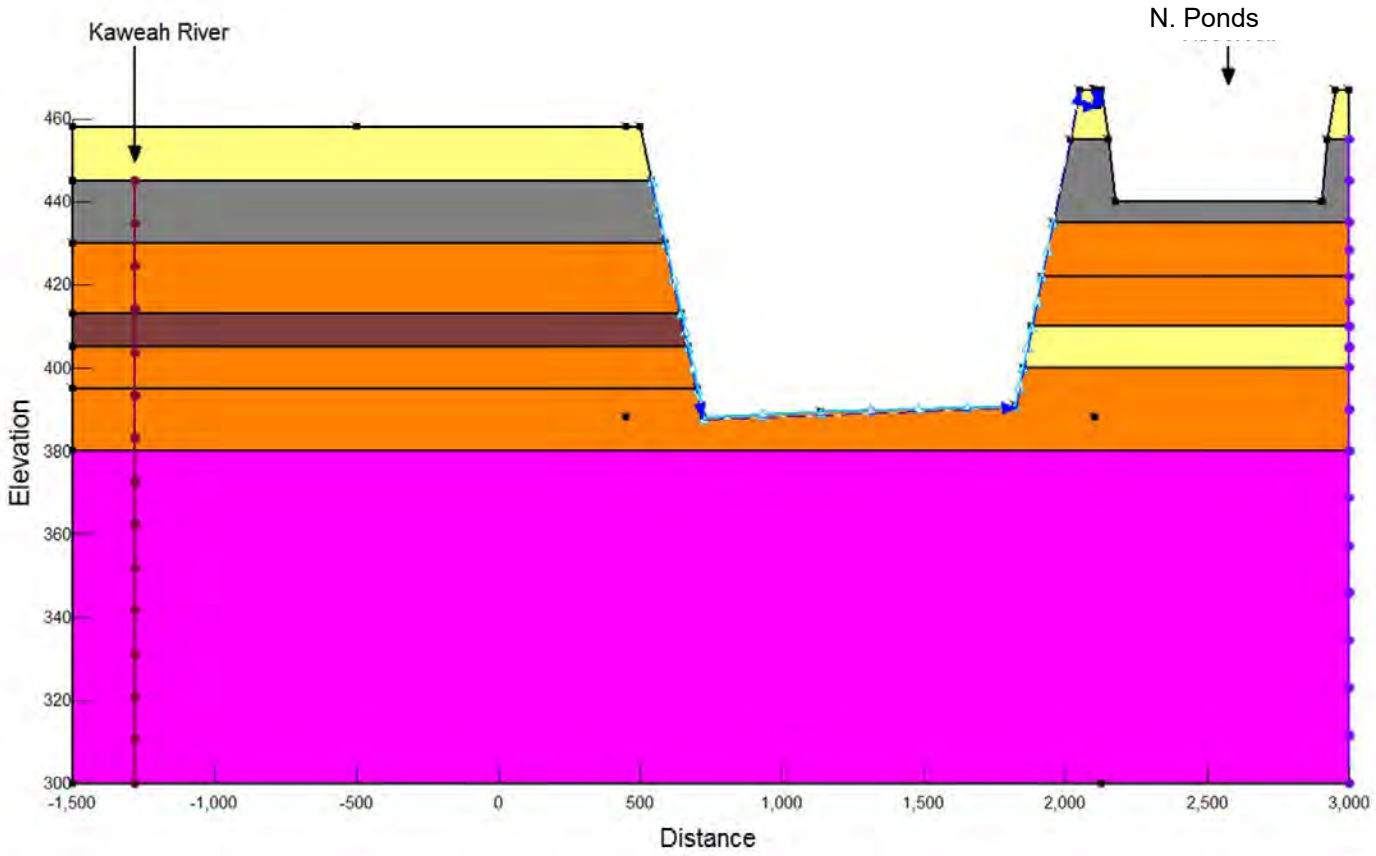


Figure D2-2: Scenario 1 (No Slurry Wall) Section 1



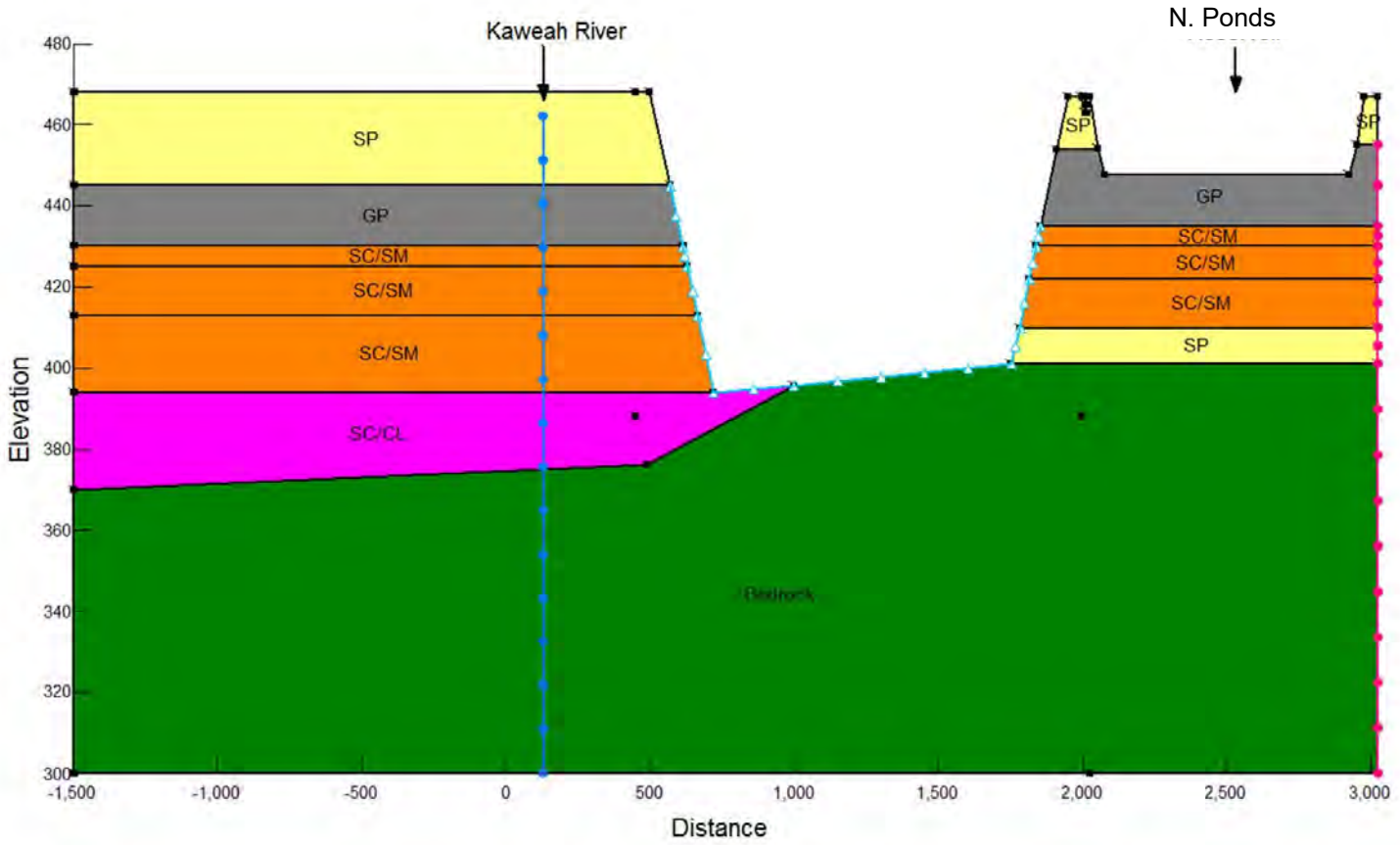
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Figure D2-3: Scenario 1 (No Slurry Wall) Section 2



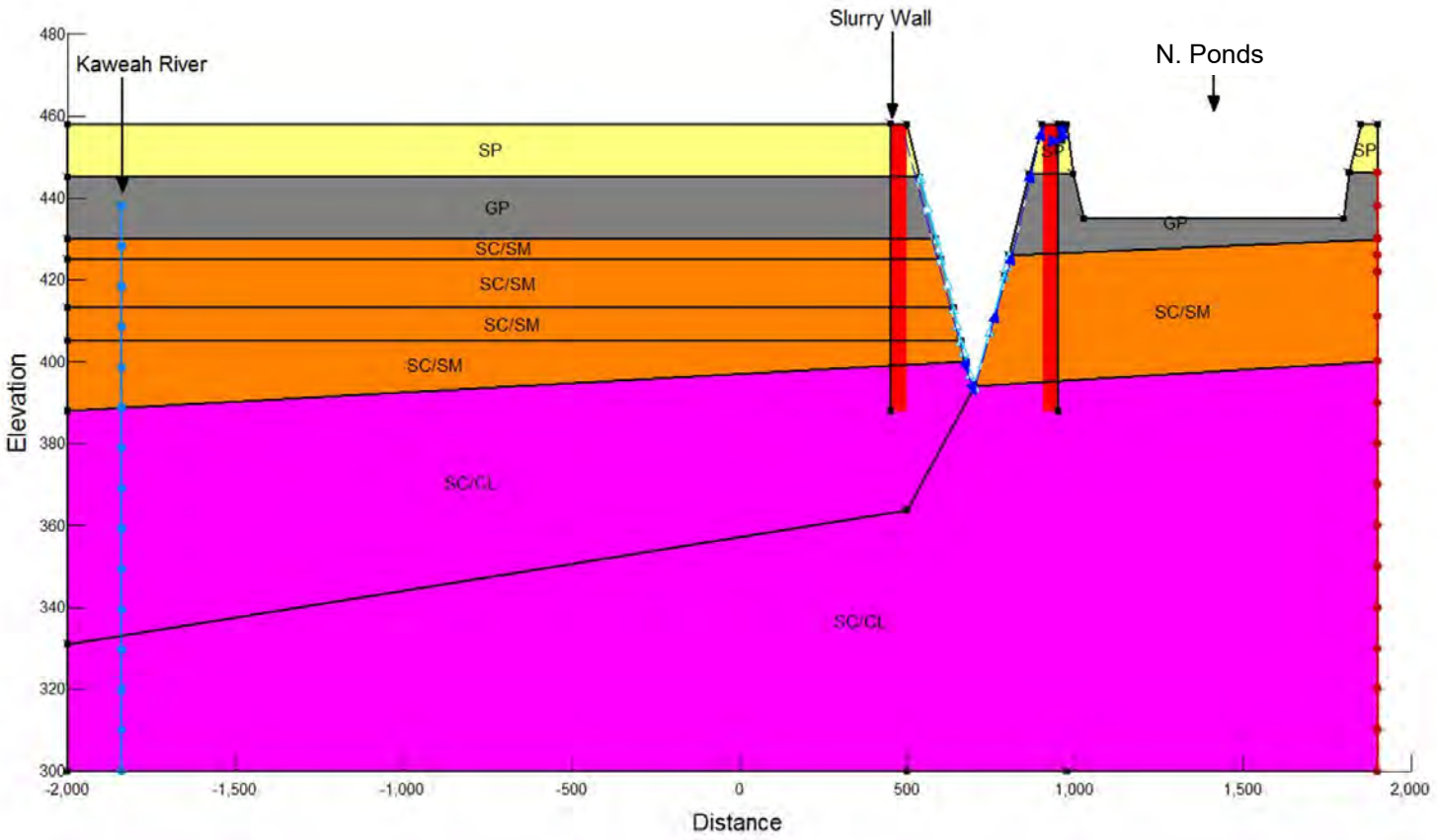
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Figure D2-4: Scenario 1 (No Slurry Wall) Section 3



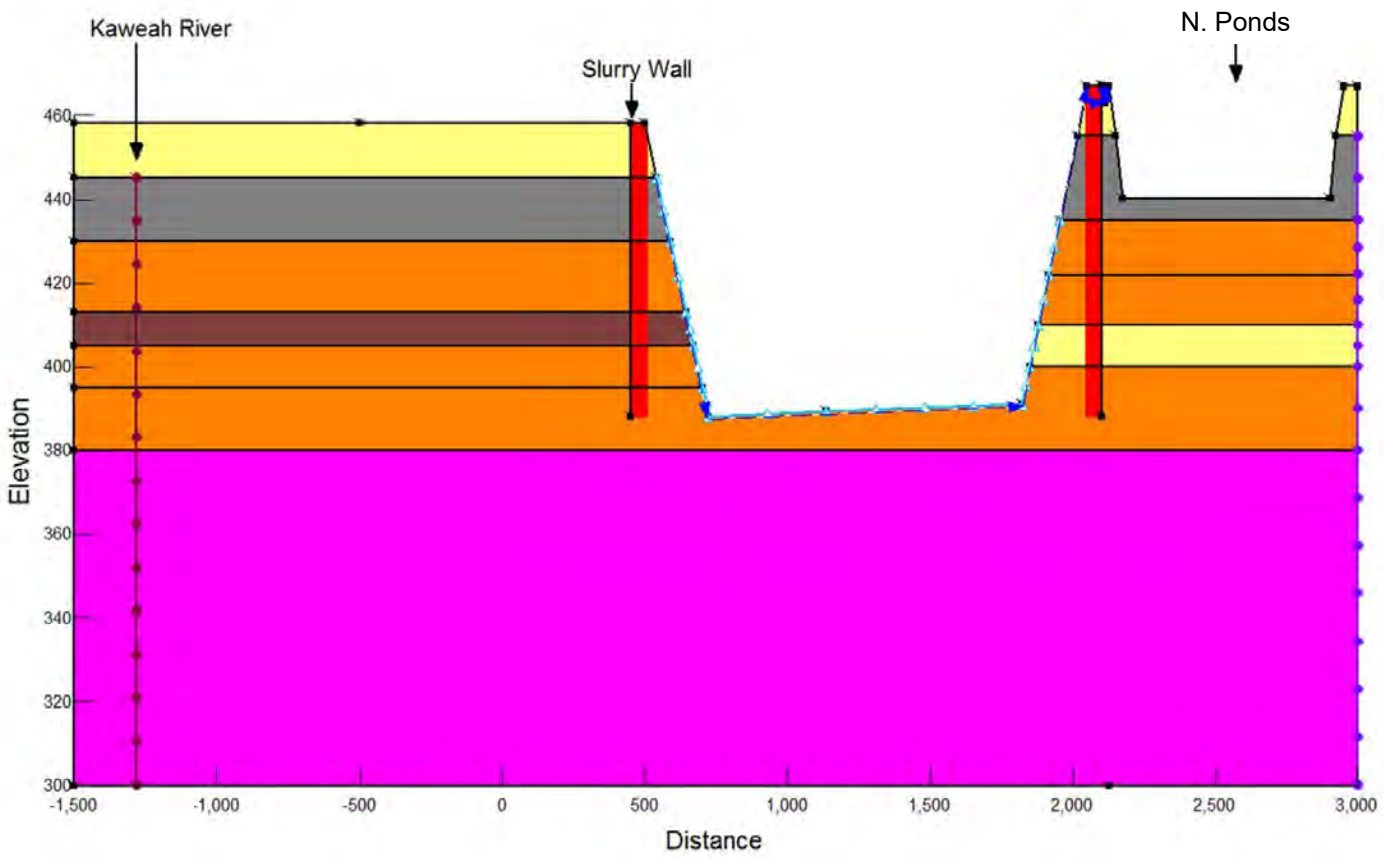
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Figure D2-5: Scenario 2 (Slurry Wall) Section 1



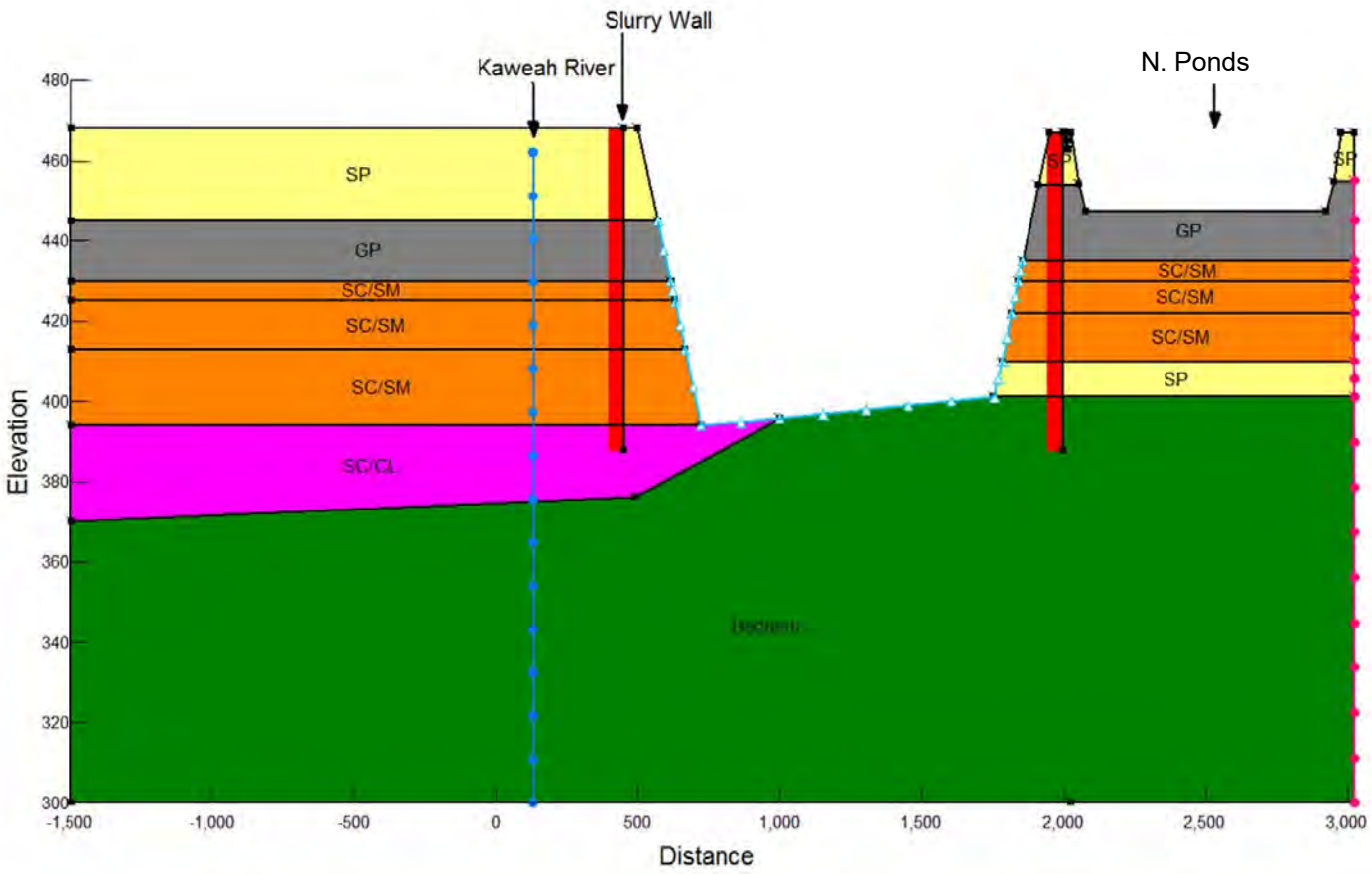
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Figure D2-6: Scenario 2 (Slurry Wall) Section 2



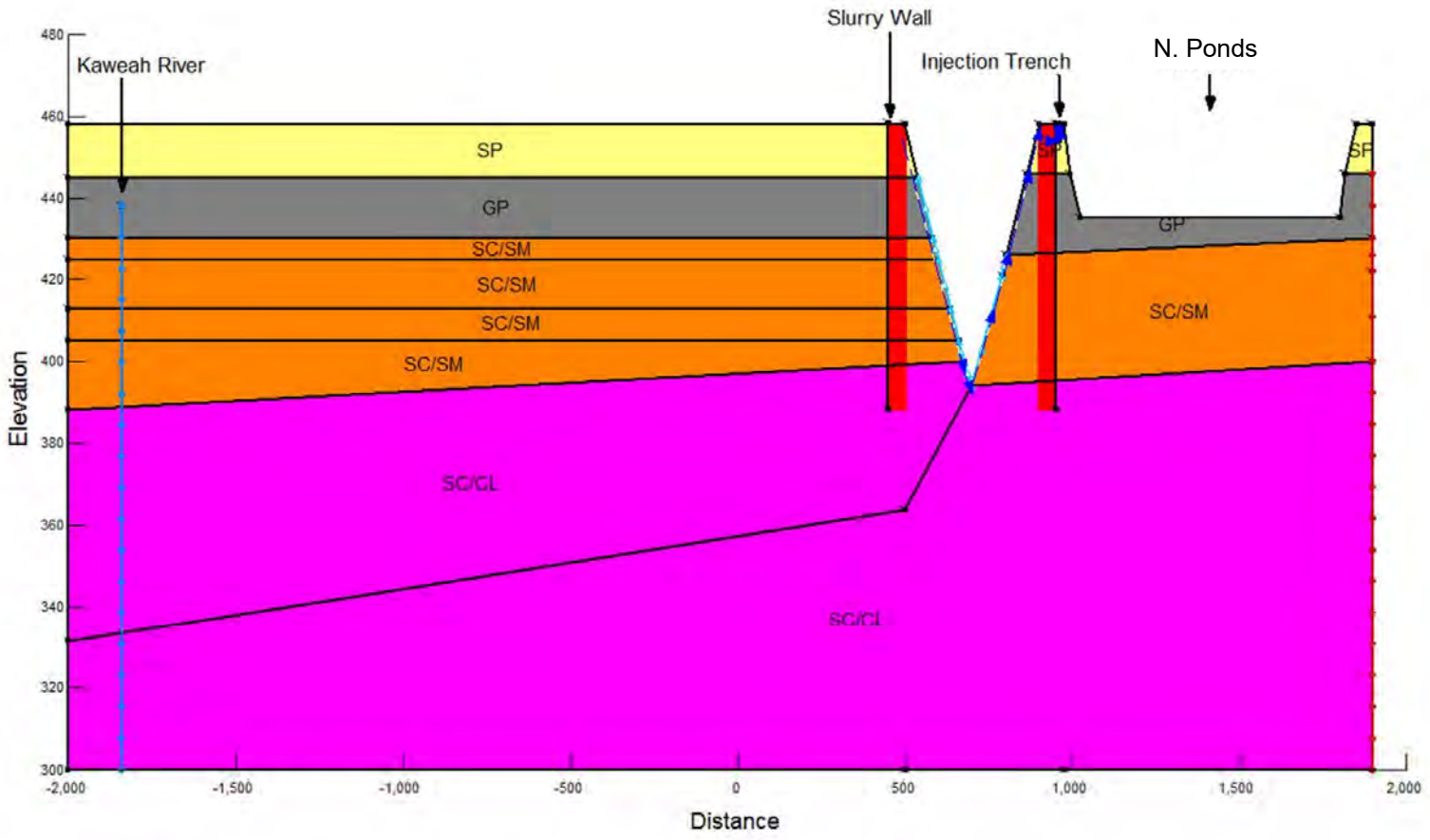
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Figure D2-7: Scenario 2 (Slurry Wall) Section 3



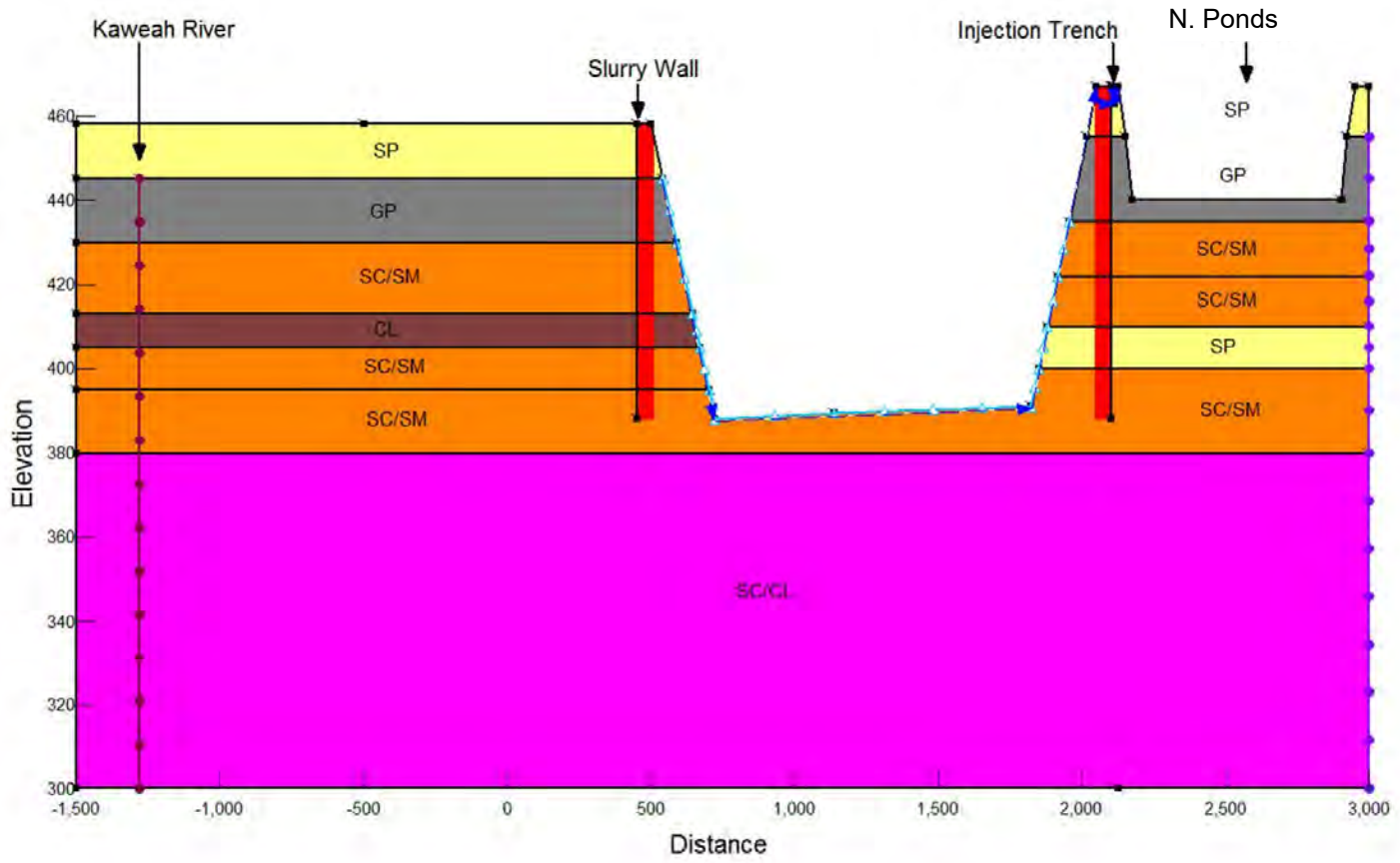
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Figure D2-8: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 1



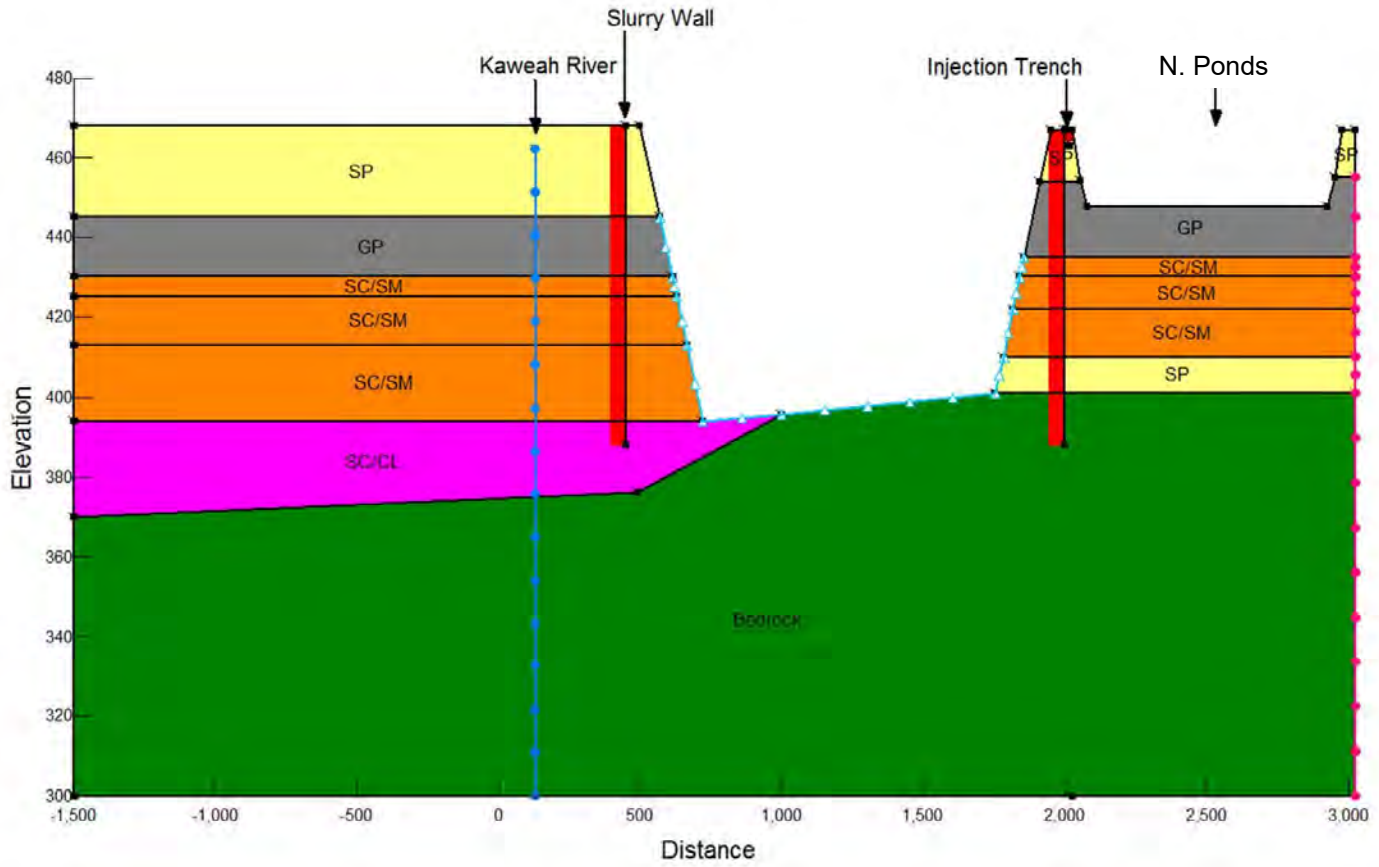
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Figure D2-9: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 2



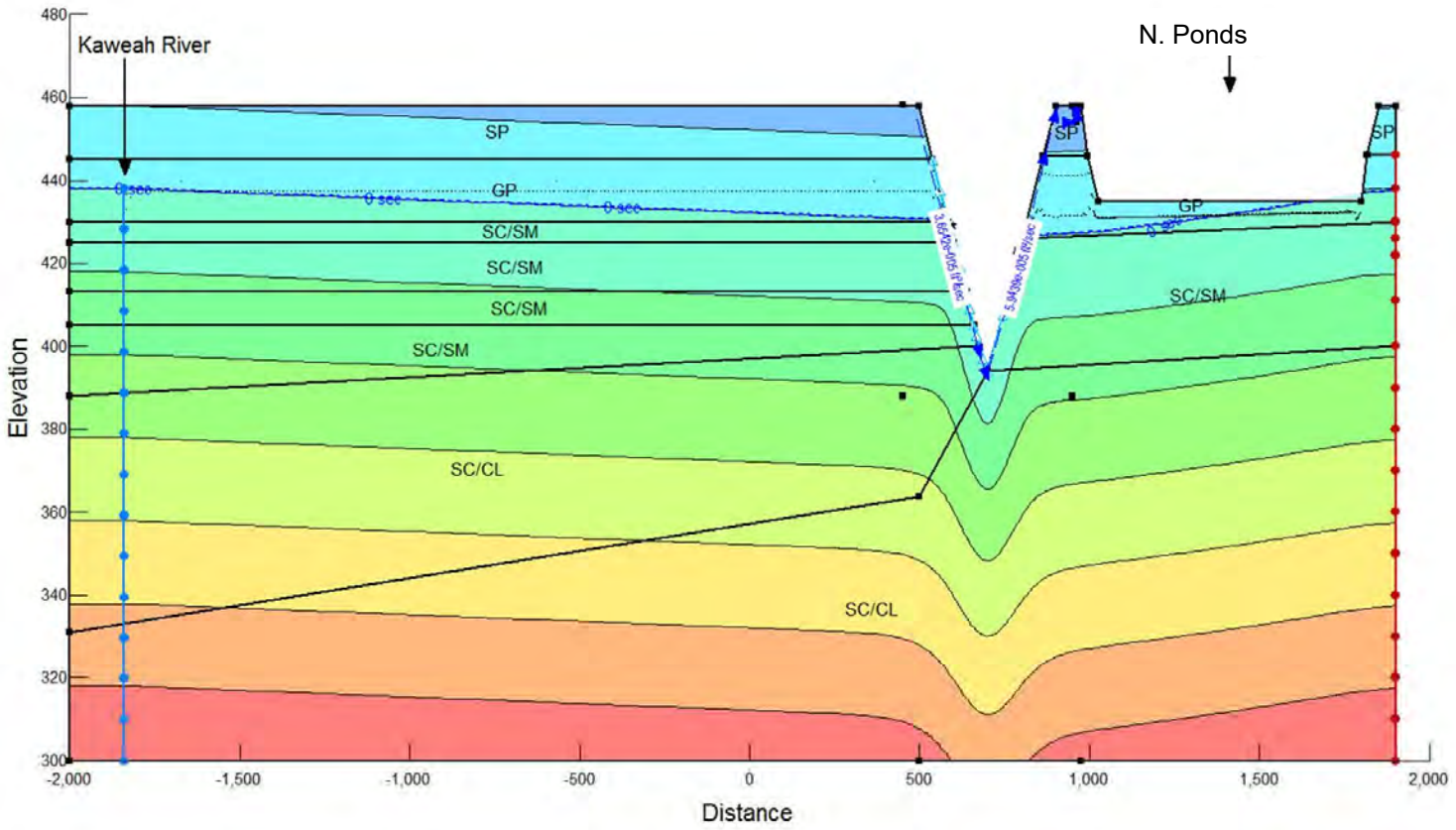
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Figure D2-10: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 3



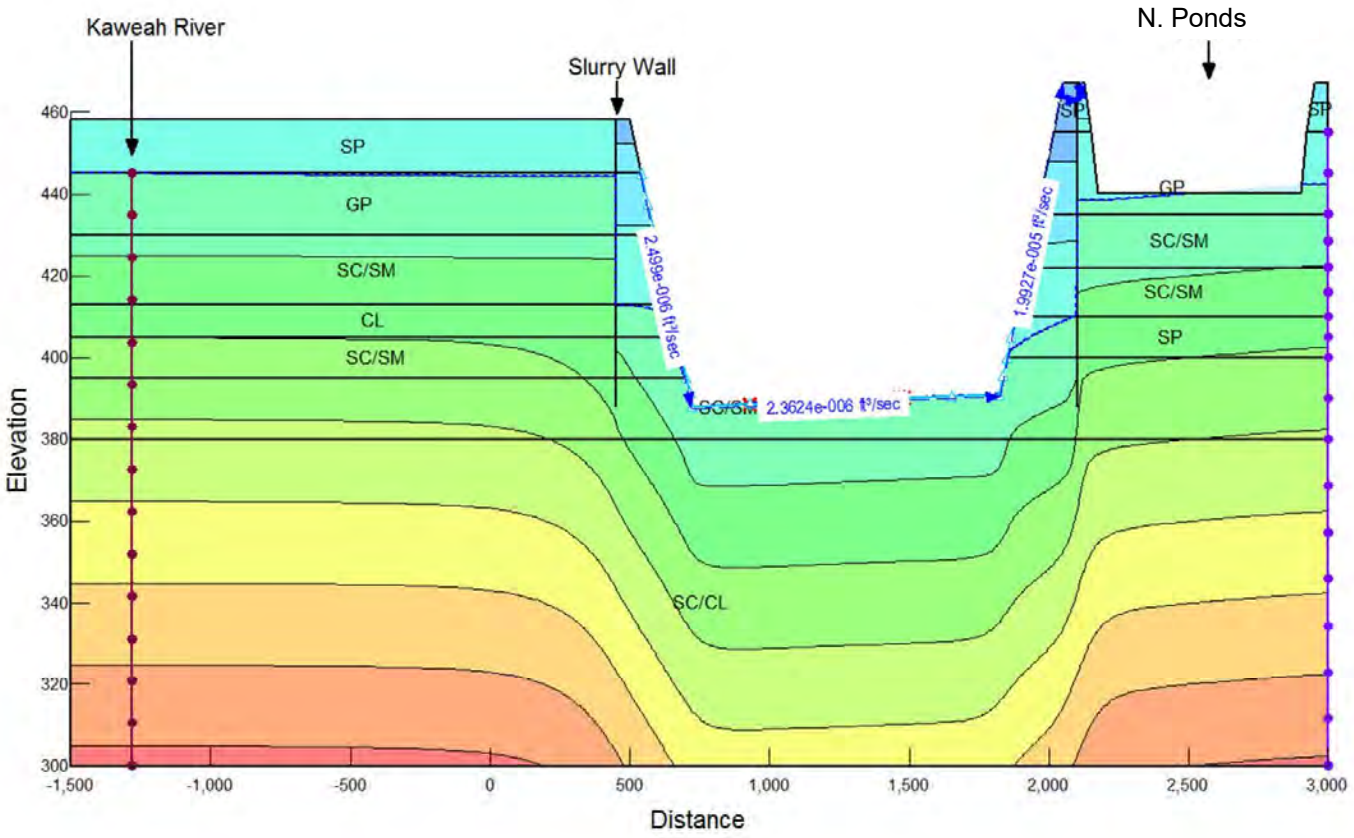
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Figure D2-11: Scenario 1 (No Slurry Wall) Section 1 Results



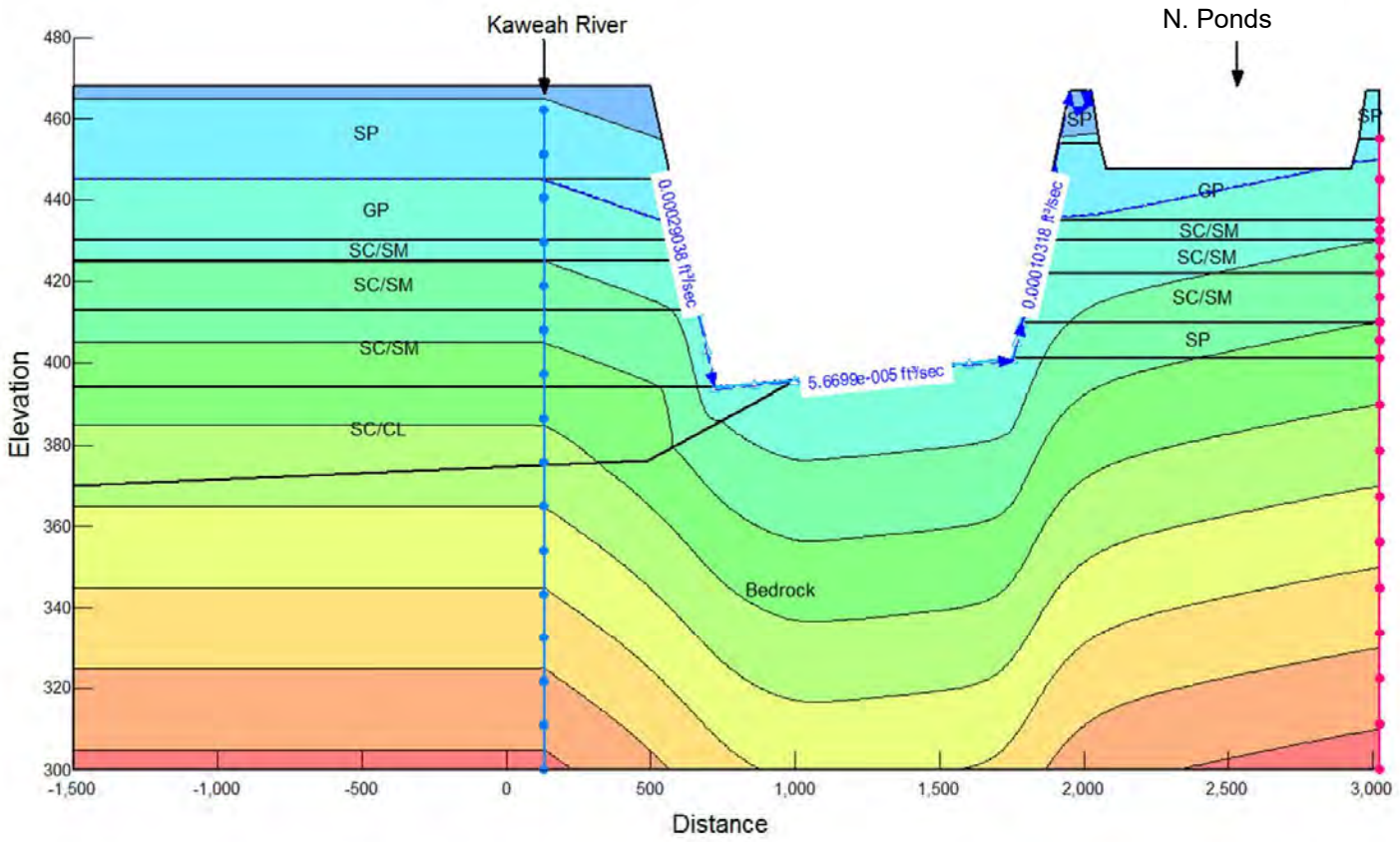
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Figure D2-12: Scenario 1 (No Slurry Wall) Section 2 Results



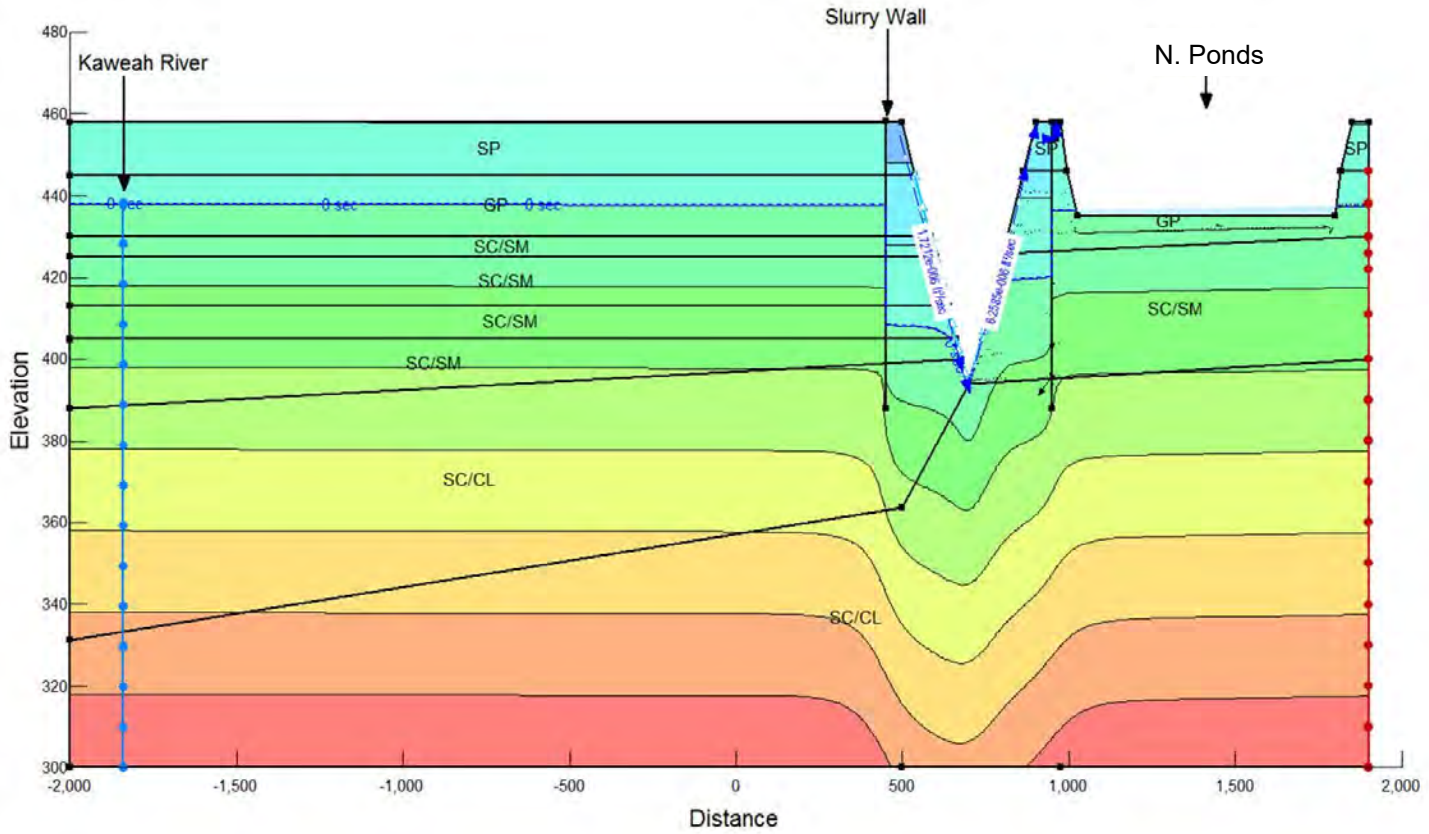
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Figure D2-13: Scenario 1 (No Slurry Wall) Section 3 Results



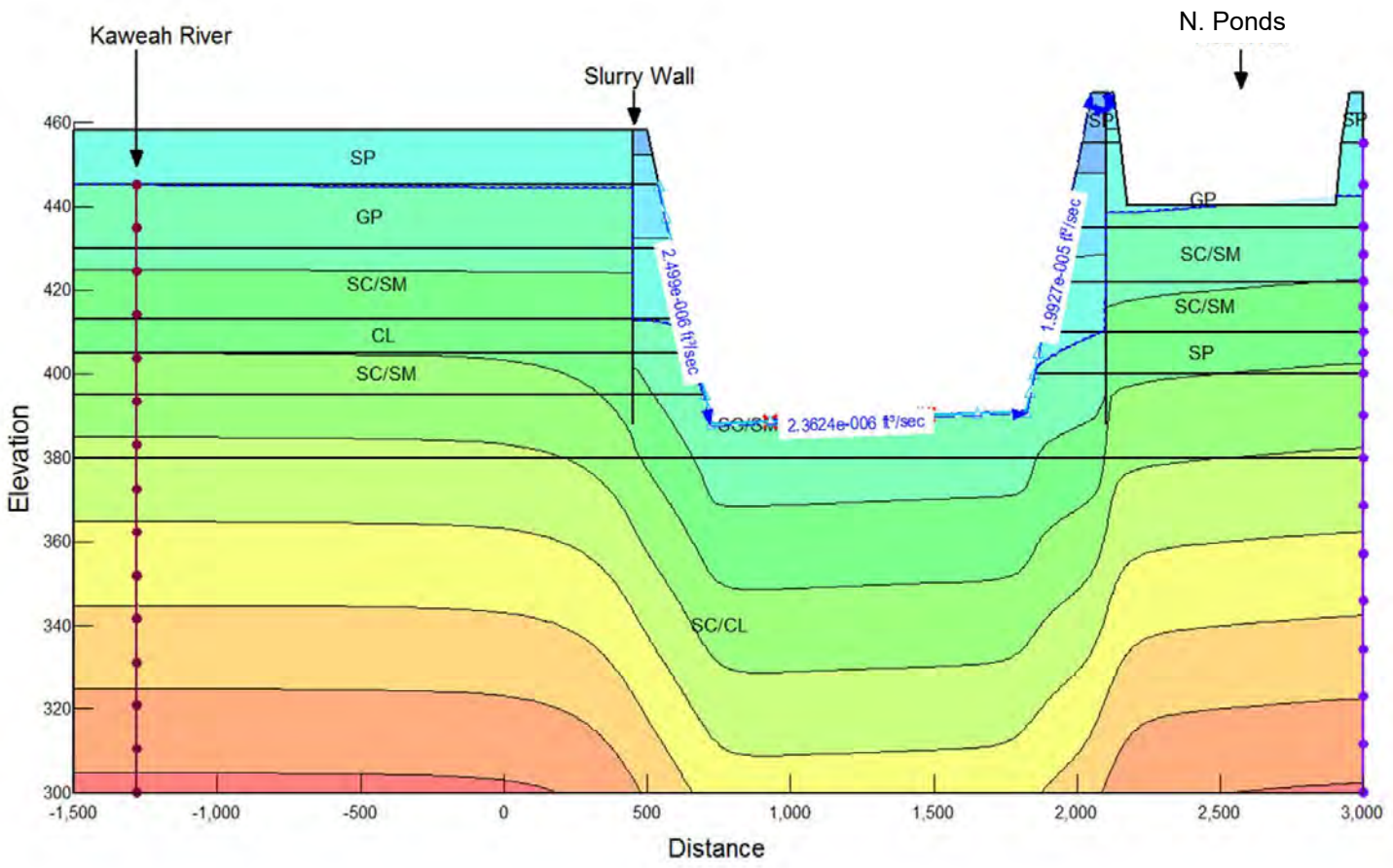
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Figure D2-14: Scenario 2 (Slurry Wall) Section 1 Results



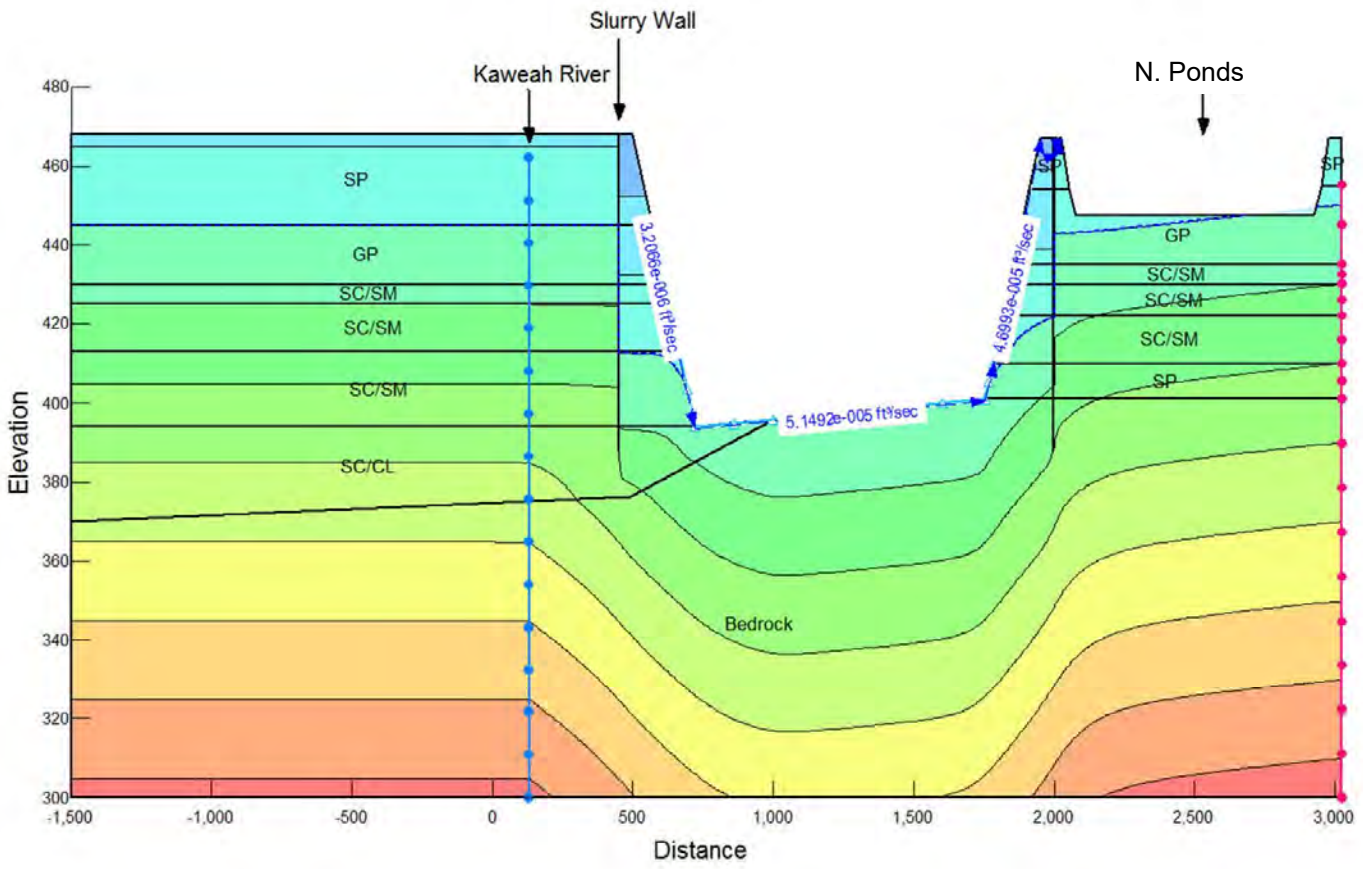
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Figure D2-15: Scenario 2 (Slurry Wall) Section 2 Results



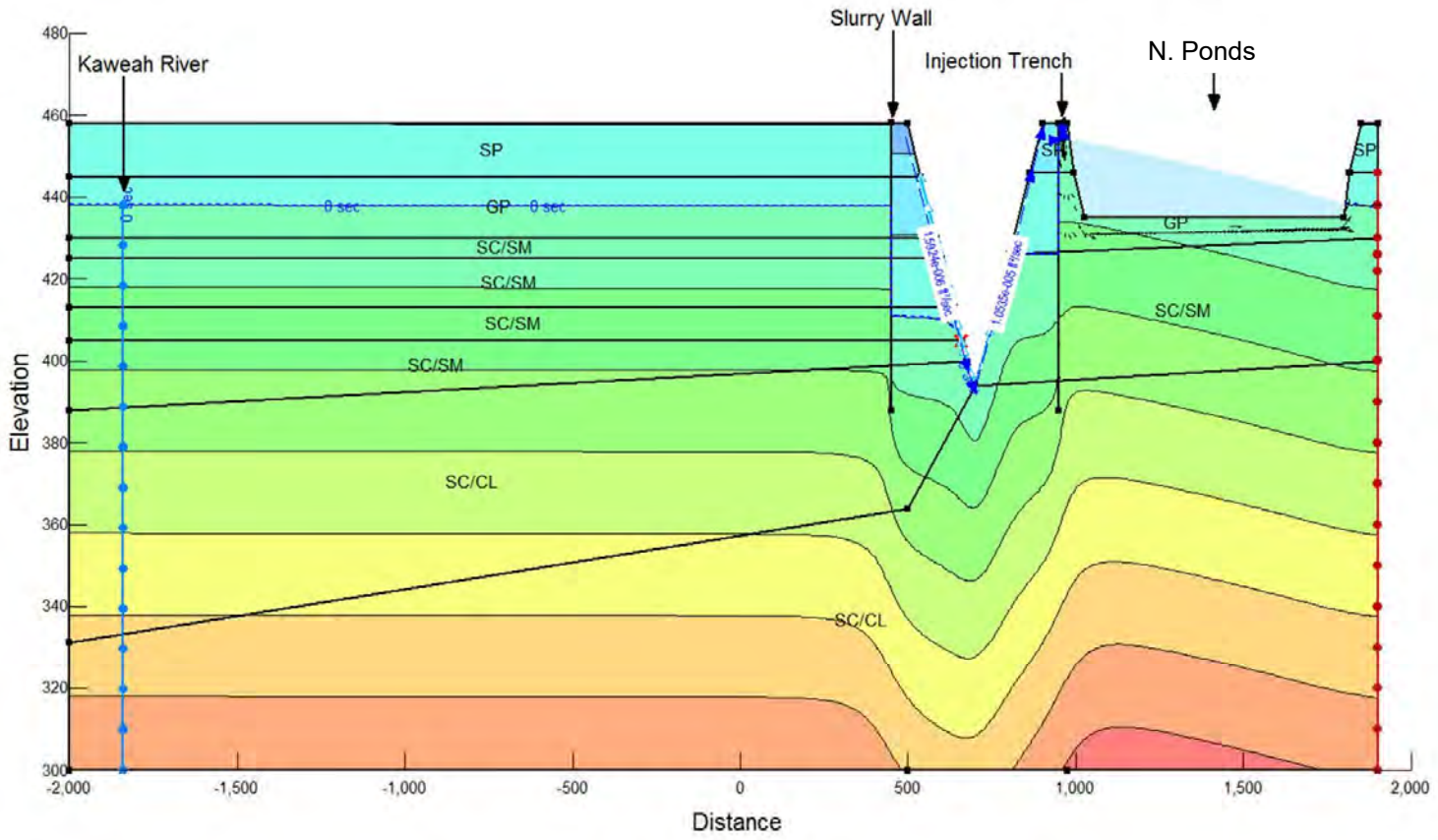
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Figure D2-16: Scenario 2 (Slurry Wall) Section 3 Results



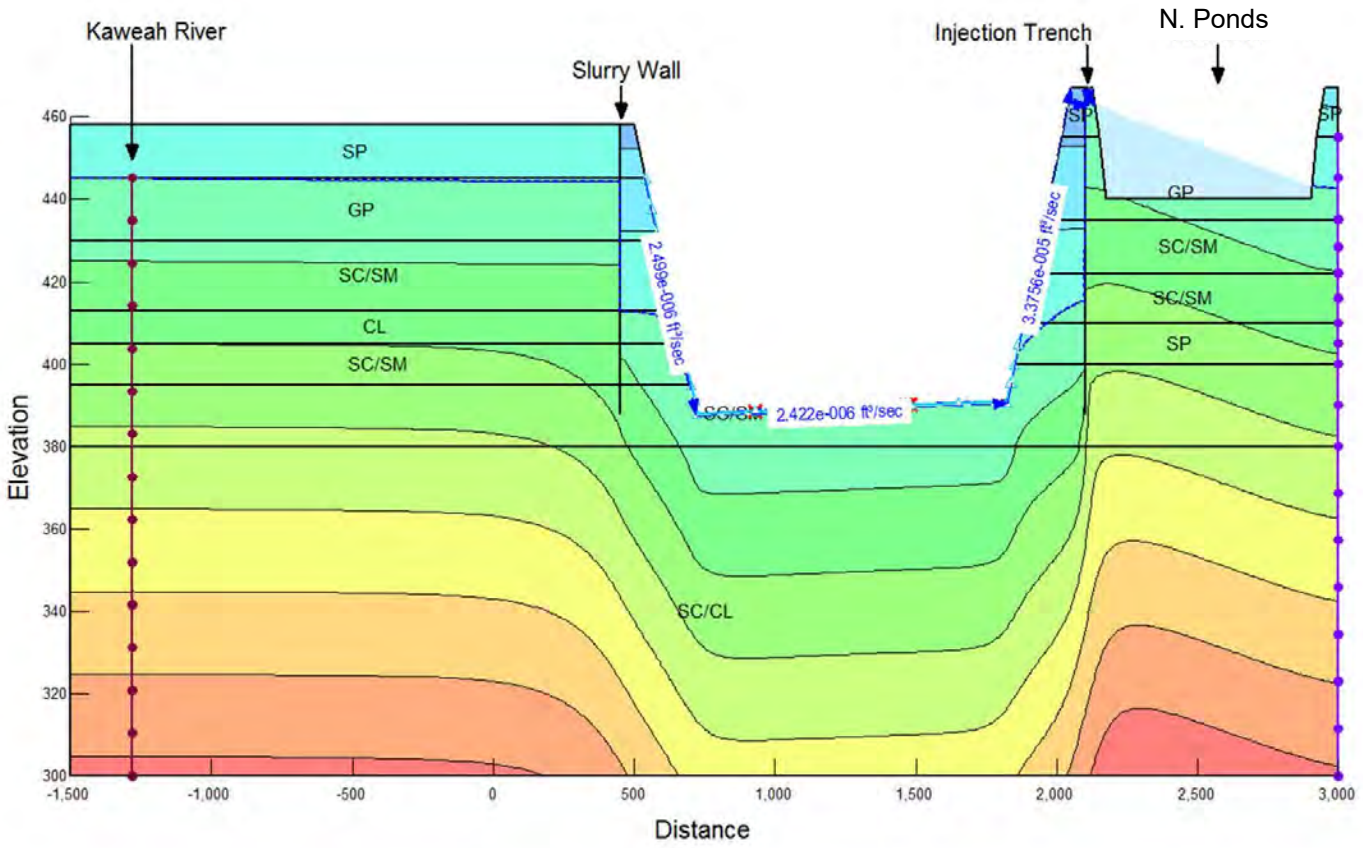
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Figure D2-17: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 1 Results



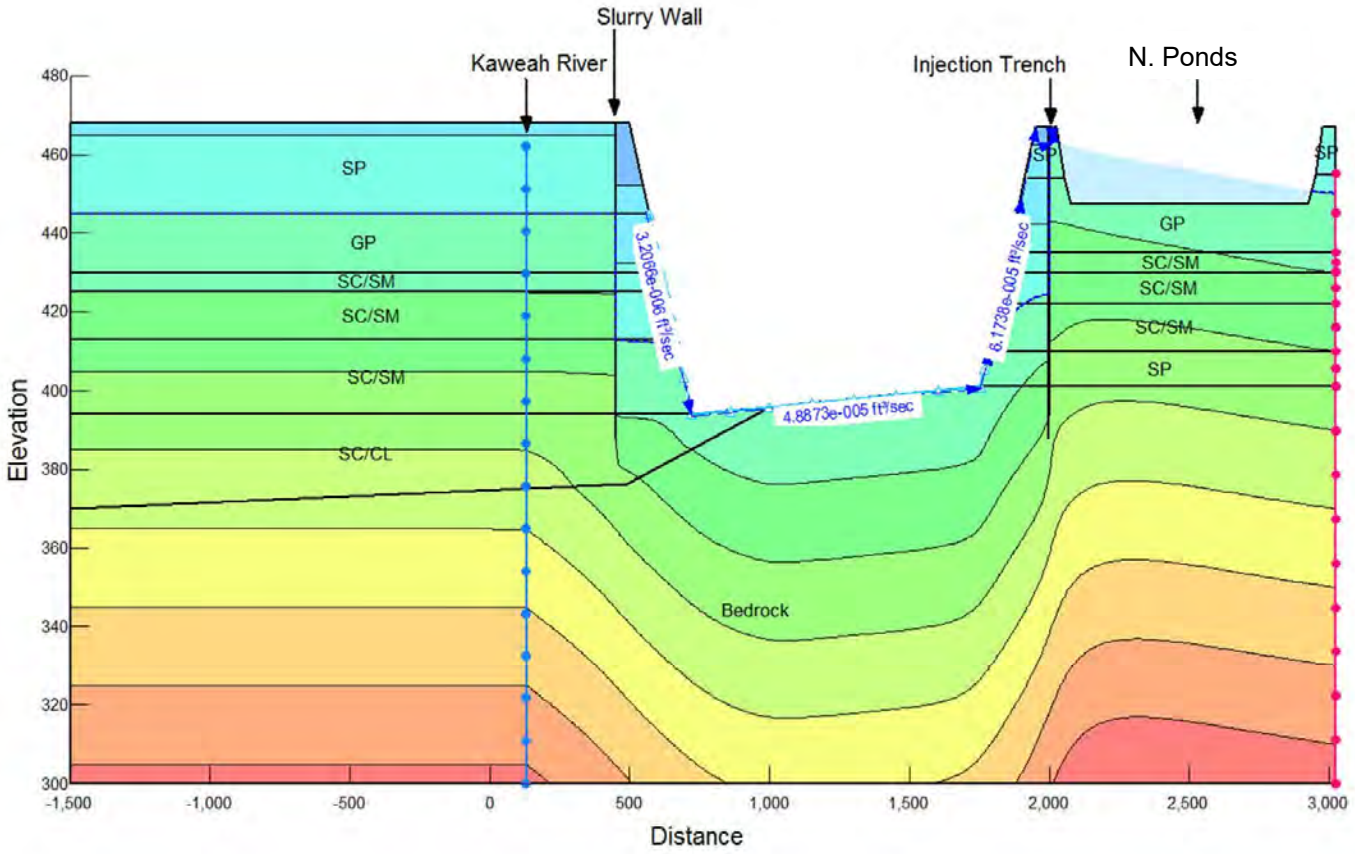
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Figure D2-18: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 2 Results



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Figure D2-19: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 3 Results



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D.3 THREE DIMENSIONAL ANALYSES

D.3.1 INTRODUCTION

This attachment describes the approach and assumptions used to estimate the seepage inflow rates through numerical and empirical methods. SLR used two methodologies to assess the inflow rates.

Firstly, a systematic groundwater pump and treat (P&T) method for capture zone analysis described by the USEPA was used (USEPA, 2008). The dewatering estimate assumes the groundwater inflows to the excavation can be represented by the saturated thickness and local gradient towards the planned reservoir (Table D3-1). This approach does not include the slurry wall and infiltration trench. However, the method is helpful as a screening tool to perform a basic assessment of the hydrogeologic conditions and as a check on the flow rates expected from the numerical modeling.

Secondly, a steady-state numerical model was developed for the Project to estimate the general groundwater condition around and seepage rate into the planned excavation for the following three scenarios.

1. The first scenario considered the construction of the planned excavation to its maximum depth (i.e., reservoir) without a perimeter slurry wall;

2. The second scenario includes slurry walls installed around the perimeter of the planned maximum excavation; and

3. The third scenario consists of augmenting scenario two by adding a reinjection/recirculation trench north of the slurry wall to recirculate the collected influent water back into the natural groundwater system.

D.3.2 BACKGROUND

The numerical assessment evaluates the anticipated changes to the baseline hydrogeologic conditions resulting from the Project. The source of lithological and hydrogeological data of the evaluation are previous studies conducted on the site, such as Kenneth D. Schmidt and Associates 2012, SLR 2021a, SLR 2021b, and Section D.2 above. Additional data from other publicly available documents were also reviewed and used as part of this assessment.

D.3.3 EXCAVATION DESIGN, SLURRY WALL, AND INFILTRATION TRENCH SETTING

The excavation design has about 5,700 ft length and variable-width ranges from 330 to 1,310 ft Figure 3D-2 and Figure 3D-11 (Provost & Pritchard Consulting Group via email, June 2021). The excavation depth ranges from 370 – 425 ft amsl from the ground surface (about 467 ft, amsl), generally overlying the clay unit and bedrock.

The slurry wall is designed to impede the inflow of water to the planned excavation from all dimensions. A thickness of one foot and hydraulic conductivity equal to that of the clay unit (0.0013 ft/day, or $5x10^{-7}$ cm/sec) was used in the model.

The infiltration trench was set to the north of the slurry wall, and the hydraulic conductivity was equal to that of the gravel (69 ft/da, or 2.5 x 10^{-2} cm/sec).

The existing ponds are represented by surface water that intercepts groundwater flow towards the reservoir. The ponds are treated in the model overlying a highly permeable material extending 10 feet below the local potentiometric surface. The impact of the ponds on the dewatering rate from the excavation was evaluated compared to the results of scenario 2.

D.3.4 METHODOLOGY

The conceptual site model (CSM) provides a framework for understanding site-specific features and physical processes that influence groundwater flow around the planned excavation. The conceptual site model (CSM) aims to organize the field data to simplify the field problem while maintaining its essential characteristics so that the system can be analyzed more readily. Of necessity simplification of site conditions is required when establishing a CSM (Anderson and Woessner, 1992).

A total of seventeen boring logs, six onsite (BSK, 2011), and eleven offsite, boring logs were used to build the CSM (Figure D3-1). The offsite boring logs were collected from the California Department of Water Resources (CA-DWR) website. The lithologic logs were reviewed for their quality, and poorly logged borings were excluded from further consideration. Based on these borings, the thickness of alluvial deposits at the Project site ranges between approximately 60 and 80 feet. The uppermost alluvial deposits at the Project site consist of sand, cobbles, boulders, silt, and clay (Luhdorff and Scalmanini, 1995). The contact between alluvial deposits and bedrock is shallower in the east and gets deeper towards the west (Kenneth D. Schmidt and Associates, 2012).

The CSM formulation involves synthesizing available hydrological, lithological, hydrogeological data contained in various reports. It includes consideration of the

hydrogeologic framework, water budget, and groundwater flow systems. Historical water levels indicate that the groundwater flows from the northeast towards the southwest **(**SLR, 2021b).

Hydrostratigraphic units of the CSM were developed using related strata that control the groundwater flow. There are six major geologic/hydrogeologic units generated from Leapfrog Works (Seequent Limited, 2020, version 4.0.1), consistent with the previous classifications presented in Figure D-2 (also Kenneth D. Schmidt and Associates, 2012; SLR, 2021a). These hydrostratigraphic units were exported from Leapfrog Works and imported into the Groundwater Vistas model grid.

D.3.5 EPA METHOD OF SEEPAGE RATE ESTIMATE

The groundwater inflow rate into the planned excavation was estimated using the following mathematical relationship (USEPA, 2008):

$$Q = K * (b * w) * i * factor$$

Where

Q = extraction rate (cubic feet per day)
K = hydraulic conductivity (ft/day)
b = saturated thickness (ft)
w = excavation width/length in this case (ft)
i = site-wide/regional hydraulic gradient
factor = 1.5 to 2.0, accounting for other contributions to the water in the reservoir, for example, horizontal flow from northeast, vertical flow from another water-bearing zone or ponds, etc.

SLR reviewed site-specific data such as:

- Range of hydraulic conductivities from seepage studies (Section D.2).
- Water levels (SLR, 2021b, CA-WDR's website)
- Site hydraulic gradient (SLR, 2021b, CA-WDR's website)
- Excavation design (surface area, width, depth, side slopes, etc. (SLR, 2021b, Provost & Pritchard Consulting Group via email, June 2021).

Using this information, SLR developed key inputs in Table D3-1, with detailed calculations and results presented in Table D3-3.

Table D3-1 – Key Inputs to the EPA Method of Dewatering Estimates

Excavation Design	
Excavation average depth (ft)	60
Unsaturated thickness around the planned excavation, b (ft)	20 - 25
Saturated thickness around the planned excavation, b (ft)	37 - 52
Length/Width/ of the planned excavation, b (ft)	5,709
Hydraulic properties, gravel (ft/day)	69
Hydraulic gradient (ft/ft) [Average of gradients]	0.012

Note:- The minimum and maximum of the saturated and unsaturated thicknesses are based on borings B1-B6 and all monitoring wells listed in Table D3-4, respectively.

Assumptions inherent to the method include:

- Homogenous, isotropic, confined aquifer of infinite extent;
- Uniform aquifer thickness;
- The saturated zone around the planned excavation represents the aquifer thickness;
- Uniform regional horizontal hydraulic gradient;
- Steady-state flow;
- Negligible vertical gradient;
- No net recharge or net recharge is accounted for in regional hydraulic gradient; and
- No other sources of water were introduced to the aquifer induced by excavation.

D.3.6 NUMERICAL MODEL SEEPAGE RATE ESTIMATE

The CSM is converted into a mathematical model by selecting a code, specifying boundary conditions, grids to represent the geologic formations, employing aquifer parameters, recharge, and discharge zones of the Site. Details of the model development are given below.

D.3.6.1 CODE SELECTION

The numerical model was constructed and calibrated in MODFLOW-USG, a new version of MODFLOW (McDonald and Harbaugh, 1988; Harbaugh, 2005) for unstructured grids (Panday et al., 2013). The modeling environment and pre-/post-processor is Groundwater Vistas version 8.03 (ESI, 2020).

The model cells can take on numerous shapes, such as triangles, octagons, and variable sizes, allowing refinement in areas of interest, i.e., the planned excavation. Unstructured grids do not necessarily require to be arranged on a row, and column bases and cells are linked together regardless of shape. The planned excavation was represented in the domain by “air” zones where high K values (assumed to be 5,000 ft/day) were assigned to let unrestricted water flow into it (Table D3-6). Groundwater Vistas was employed for a pre - and post-processing of input and output data, respectively. It also provides an extensive set of tools for developing, modifying, and calibrating numerical models.

D.3.6.2 MODEL DEVELOPMENT AND INPUT DATA

The three-dimensional geologic model domain was built in Leapfrog Works and exported to the Groundwater Vistas. Historical hydrogeological data were reviewed and processed to represent average conditions (Table D3-4). The model was developed to simulate the steady-state groundwater condition based on the average data of historical water levels. About fifteen monitoring wells, inside and outside the property, were used for calibration. Ten monitoring wells were used as target heads, and the remaining five wells were used to establish General Head Boundary conditions (Table D3-4).

D.3.6.3 MODEL GRID AND BOUNDARY CONDITIONS

No-flow boundaries were assigned to parts of the southern and northern edges of the domain to simulate the general northeast to southwest groundwater flow gradient. These boundaries were set at a sufficient distance from the planned excavation to allow the model to calculate the impact of dewatering the reservoir on groundwater levels surrounding it. General head conditions that allow groundwater flow into and out of the system were set on the northeast and southwest. Water level heads for the General Head Boundaries were set based on the average historical water levels collected from adjacent monitoring wells (Table D3-4). General head conductances were set high enough to permit flow into and out of the system depending on the surrounding heads. A river boundary was specified to imitate the Kaweah River to the south (Figure D3-5).

The model grid consists of 6 layers, 356 columns and 127 rows, with grid spacing ranging from 21 ft to 200 ft and 21 ft to 282 feet for columns and rows, respectively (Figure 3D-1). Finer grid spacing was applied around the planned excavation. The model domain has an active area of 77.7 million sq. ft.

D.3.6.4 AQUIFER PROPERTIES AND RECHARGE

For the steady-state model, the principal aquifer properties are hydraulic conductivities and recharge. The hydraulic conductivities of the major geologic units were determined

by geotechnical testing through grain size analyses (ASTM D422) and Section D.2. Hydraulic conductivity values set for the calibrated model are restricted to be between 95 % to 105 % of the values based on the above geotechnical testing and are presented in Table D3-6.

Recharge flux to the system was estimated from the average precipitation collected from the site vicinity, namely LEMON COVE (LMC). The annual precipitation data summarizes measurements collected from June 2019 to June 2021. The recharge flux applied to the calibrated model is roughly 10 % infiltration of the recharge estimated from LMC (Table D3-2).

Table D3-2. Calibrated Model Recharge

Precipitation Averages (Inches)	
January	2.73
February	2.52
March	2.08
April	1.45
May	0.49
June	0.15
July	0.01
August	0.03
September	0.2
October	0.71
November	1.4
December	2.26
Yearly Precipitation (in)	*14.03*
Recharge flux (ft/day) 20%	*0.000641*
Recharge flux (ft/day) 10%	*0.000320*
Recharge flux (ft/day) in the calibrated model	***0.000285***

D.3.7 MODEL CALIBRATION

Calibration of a numerical groundwater flow model is the process of adjusting model parameters to obtain a reasonable match between field-measured values and model predicted values of heads (groundwater levels) and fluxes (groundwater flows). There are two ways of finding model parameters to achieve calibration (Anderson and Woessner, 2002). (1) Manual trial and error adjustment of parameters and (2) automated parameter estimation. Groundwater Vistas (GV) assists model calibration in three ways (ESI, 2020):

(1) calculation of calibration statistics for a head, drawdown, or flux, (2) automated parameter sensitivity analysis, and (3) automatic model calibration using a nonlinear least-squares technique built into the GV interface or using external inverse models such as PEST (Doherty, 2010). All these methods have been applied to calibrate the steady-state model.

D.3.8 RESULTS

D.3.8.1 RESULTS OF EPA METHOD

The six boring logs and the resulting three-dimensional geologic model demonstrate that gravel and sand dominate the subsurface beneath the planned excavation. The inflow rate was estimated to be 750 (gpm). The estimate was based on calculations with limited site data, and the actual seepage rates may vary. Results are summarized below in Table D3-3.

Table D3-3. Estimation of Extraction Rates

					[1]Scenario 1 - Factor = 1.5		***[2] Scenario 2 - Factor = 2.0***	
Excavation Inflow Estimates	**K[1] (ft/day)**	**b[2] (ft)**	**W[3] (ft)**	**i[4] (ft/ft)**	**Q[5] (ft3/day)**	**Q[5] (gpm)**	**Q[6] (ft3/day)**	**Q[6] (gpm)**
Inflow Rate (Q)	6.9E+01	51.91	5,709	0.0035	108,418	564	144,383	750

Note
1 Scenario 1 represents inflows to the ponds that are coming from the north only.
2 Scenario 2 assumes a small component of inflows from the northeast.
3 The methodology and assumptions are provided in USEPA's "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems", EPA 600/R-08/003, January 2008.

D.3.8.2 RESULTS OF STEADY-STATE NUMERICAL MODEL

3.8.2.1 Calibration Results

The calibration process confirmed that hydraulic conductivities and recharge previously applied for SEEP/W simulation (Section D.2) are still valid. The final calibrated parameters are also within 95 % to 105 % of the previously determined or used to understand the hydrogeologic condition of the Project Site. Locations of targets are provided in Figure D-1. A summary of the calibration steady-state water level targets is provided in Table D3-4.

Table D3-4 Calibrated Water Level Comparison

No.	Target	Easting (UTM, m)	Northing (UTM, m)	Layer	Water Level, Observed (ft, amsl)	Water Level, Modelled (ft, amsl)	Remark
1	B-1	315652	4029539	2	438	441	Target well
2	B-2	316076	4029512	2	443	445	Target well
3	B-3	316551	4029302	2	447	451	Target well
4	B-4	316743	4029518	2	452	453	Target well
5	B-5	316300	4029264	2	446	447	Target well
6	B-6	317022	4029113	2	459	459	Target well
7	363918N1190734W001	314045	4029402	2	429	430	Target well
8	363880N1190651W001	314781	4028965	2	433	430	Target well
9	364010N1190362W001	317404	4030352	2	460	457	Target well
10	MW2	314315	4029330	2	431	430	Target well
11	363827N1190542W001	315746	4028356		439.9		GHB well
12	364060N1190645W001	314877	4030961		461.1		GHB well
13	MW1	314615	4028497		426		GHB well, estimated head
14	MW3	313037	4029045		428		GHB well
15	MW4	313184	4028212		420		GHB well

Note: 1) North America NAD83 UTM zone 11 N (meters)

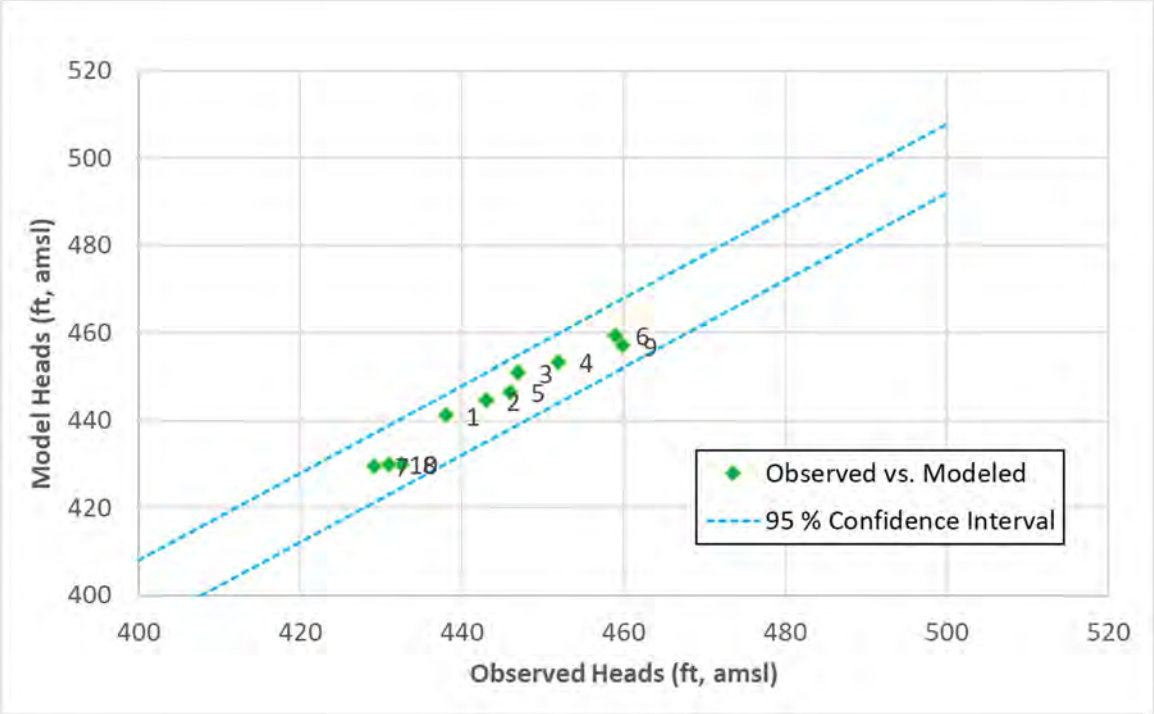
3.8.2.2 Calibration Statistics

Table D3-5 presents a summary of the statistical measures for the steady-state calibration. A Scaled root mean square (SRMS) of less than 10% is desirable and less than 5% preferable. The model's SRMS is about 7.0% (Table D3-5).

Table D3-5 Calibration Statistics

Residual Mean (ft)	-0.47501
Absolute Residual Mean (ft)	1.769329
Residual Std. Deviation (ft)	2.098374
Sum of Squares (ft^2)	46.288088
RMS Error (ft)	2.151467
Min. Residual (ft)	-3.914231
Max. Residual (ft)	2.855395
Number of Observations	10
Range in Observations (ft)	30.7
Scaled Residual Std. Deviation	0.068351
Scaled Absolute Residual Mean	0.057633
Scaled RMS Error	0.07008
Scaled Residual Mean	-0.015473

Chart 3-1 Observed vs. Simulated Groundwater Levels (Steady-State)



3.8.2.3 Calibrated Hydraulic Conductivities

A summary of the final calibrated parameters used for the simulation of the above-mentioned three scenarios is provided in Table D3-6.

Table D3-6 Calibrated Conductivity and Storage Parameters

Parameter	Kx (ft/day)	Ky (ft/day)	Kz (ft/day)
Bedrock	0.3091331	0.3091331	0.00293969
Clay	0.001235	0.001235	0.0013
Silty/Sandy Clay	0.004515	0.004515	0.000371081
Silty/clayey sand	0.139555	0.139555	0.06556124
Gravel	69.3	69.3	6.6
Sand	4.75	4.75	0.5
Air	5000	5000	5000

Table D3-7 Calibrated Recharge Parameters

Parameter	Description	Rate ft/day	% Annual Rainfall
R1	Site-wide	0.000285	10.0%

D.3.8.3 WATER BALANCE

The water balance for the calibrated model is provided in Table D3-8. General Head Boundary comprises most of the total inflows and outflows.

The model is considered to have a good mass balance; flow rates entering and leaving the system are 303 gpm (58,167 ft^3/day) and 302 gpm (58,158 ft^3/day), respectively. The corresponding percent discrepancy is low, 0.02%.

Table D3-8 Summary of Water Balance (steady-state, non-project condition)

	In (ft^3/d)	Out (ft^3/d)
Constant Head	0	0
River	24,634	8,367
General Head	31,477	49,791
Recharge	2,057	0
Total	**58,167**	**58,158**
Discrepancy (In-Out)	8.8 ft3/d	0.02 %

The calibrated model's parameter distribution led to the best overall simulation of the hydrogeologic conditions predicted after the planned excavation placement under the three scenarios mentioned above (Figure 3D-3). Results of the predictive simulations are provided below.

D.3.8.4 RESULTS OF PREDICTIVE MODEL SIMULATION

The results of the predictive models for the three scenarios mentioned above are explained in detail in the following sections.

3.8.4.1 Results of the Frist Scenario- Excavation without Slurry Walls

As the excavation draws more water, the potentiometric surface around the excavation declines progressively to the bottom of the reservoir that ranges from 390 ft amsl to 424 ft amsl. When the resulting potentiometric levels are compared to the natural condition, the drawdown inside the excavation ranges from 43 ft amsl to 65 ft amsl. The shallower water level follows silty/sandy clay or bedrock within the planned reservoir, as the excavation halts at the clay or bedrock units (Figure D3-4).

Figures D3-3 through D3-5 demonstrate the natural condition, project-condition and comparison of the natural (existing) water level with the predicted water level after excavation.

The drain cells, set at 390 ft amsl within the reservoir, quantify the amount of water that needs to be dewatered. The steady-state model estimates the total inflows into the reservoir to be approximately 830 gpm (Table D3-9).

3.8.4.2 Results of the Second Scenario- Excavation with Slurry Walls

The placement of the slurry walls changes the inflow rate into the excavation significantly. When the slurry walls extend to the bottom of layer 2 (~ 378 ft amsl), the barrier diminishes the inflow into the excavation to 70 gpm a reduction of approximately 90% from the previous scenario (Figure D3-6).

To simulate the case where the slurry wall depth is less extensive, the second layer was divided into two and the slurry was set to layer one and half of layer two. It is then assumed, that the slurry wall is installed to a shallower depth, i.e., only through the upper half of layer 2. The inflow increased by two folds compared to the results of scenario two (i.e., from 70 gpm to 160 gpm).

The following figures compare the water level changes caused by excavation with the slurry walls (Figures D3-6 and D3-7).

The model results indicate limited groundwater depression compared to the natural condition. The placement of the reservoir still draws groundwater flow towards it despite the placement of slurry walls. The depression is proportional to the lower inflow rate (160 gpm) and occurs dominantly in layer two. The average depth to the water table in layer one is about 50 % of the thickness of the layer (~22 ft), and thus, a limited decline in the groundwater level. Layer two is fully saturated and experiences an increased decline in groundwater level due to a proportionally higher flow to the reservoir. Overall, the groundwater depression is significantly less when compared to scenario 1. The increased decline in Layer 2 indicates that the pre-excavation upward gradient is reduced. The excavation intercepts the groundwater flow; however, below the bottom of the reservoir, it remains significantly unchanged and is governed by a regional gradient.

3.8.4.3 Results of the Third Scenario- Excavation with Slurry Walls and Infiltration Trench

When scenario two is augmented by the infiltration trench, the estimated inflows into the planned excavation do not change significantly from the estimated rate of scenario two. A limited groundwater mounding is observed in layer one due to about 70 gpm of flux infiltrated through a trench (Figure D3-6 through D3-8). In layer two, like scenario two, depression of groundwater is observed due to the inflow to the excavation.

The results indicate that the slurry wall controls the flow around the excavation (Table D3-9) dominantly.

Table D3-9 Model Mass Balance

Condition	Flux (gpm)	Remarks
Planned Excavation in Layers 1 and 2 [No Slurry Wall]	**Scenario - 1**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl
	830	
Planned Excavation surrounded by a Slurry wall in Layers 1 and 2 [Scenario 2 with a Slurry wall extended to layer 1 and part of layer 2]	**Scenario - 2**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl. [Bottom elevation of sublayer 2-1 is ~ 400 ft amsl.]
	70	
	160	
Planned Excavation surrounded by a Slurry wall with Infiltration Trench on the North [Scenario 3 with a Slurry wall extended to layer 1 and part of layer 2]	**Scenario - 3**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl [Bottom elevation of sublayer 2-1 is ~ 400 ft amsl.]
	74	
	174	

To further characterize inflow for the slurry wall scenario, a different completion depth as assumed. The slurry wall was set to layer one and half of layer two by dividing layer two into two sublayers. The results indicate this would increase the inflows slightly to 160 and 174 gpm respectively (Table D3-93, Figure D-9).

SLR notes that the results of the numerical simulations are based on simplifications of the actual field condition. The actual dewatering rates are expected to be around the approximated inflow rate but may be higher or lower by some amount.

D.3.9 SENSITIVITY ANALYSIS

Sensitivity analyses were conducted to understand how changing some conditions affects the inflow rates to the excavation. The changes made to evaluate the sensitivity of the model are the following.

1. Existing ponds to the North of the Reservoir, which vary in size in the Google Earth historical images, were set as high permeability subsurface material that intercepts groundwater. The “air” zone (5000 ft/day) was assumed up to 10 ft depth below the water level as measured by nearby monitoring wells. Its impact is evaluated by the resulting inflow rate towards the reservoir.
2. In addition, to assess the robustness of the slurry wall in minimizing inflows to the excavation, a simulation was performed assuming a worst-case failure of a segment of the wall, and inflow rates were estimated and compared with the results of scenario two.

D.3.9.1 SENSITIVITY ANALYSES

The following changes were made to analyze the sensitivity of the model to changes in the input parameters.

Existing Ponds to the north of the Reservoir. The pond’s water was treated as surface water intercepting groundwater through artificially high hydraulic conductivity (“air” zone (5000 ft/day)). The subsurface beneath the pond is assumed to be 10 ft below the local water level and is restricted to layer one (Table D3-10). The results indicate the inflows (65 gpm) would be like those with groundwater levels in the area. The slight decrease is due to the slightly differing heads assume in groundwater and the ponds respectively.

Slurry Wall failure. The failure mode analysis assumed that the slurry wall for scenario two was also assumed to fail using two different sizes. Failure of four columns in layers one and two (84 ft by the saturated thickness of layer one and 84 ft by 45 ft in layer two) resulted in an inflow increase by more than two-fold to 190 gpm (Table D3-10). The failure in the wall will occur over an area of 42 feet by 45 feet (i.e., two columns and layer one and half of layer two), the resultant inflows remain the same as scenario 2 (Table D3-10).

Table D3-10 Model Sensitivity Analyses

CONDITION	FLUX (GPM)	REMARKS
Ponds to the North of the Reservoir (Slurry walls set in Layer 1 and Layer 2)	65	The ponds intercept some groundwater flowing towards the reservoir
Slurry walls set in Layer 1 and Layer 2 assumed to fail in bigger section (26 ft by 45 ft)	Scenario - 2 (modified)	
	190	
Slurry walls set in Layer 1 and Layer 2 assumed to fail in smaller section (13 ft by 22.5 ft)	Scenario - 2 (modified)	The small crack does not change the results of Scenario 2.
	70	

3.9.1.1 Model Uncertainties

It is important to understand numerical models have their limitations and the results should be considered approximate at these stage two methods have essentially be applied, i.e. Both 2-D and 3-D analyses to increase the level of confidence in the results. For purposes of these analyses, it is anticipated that during the detailed design process, added field data will be made available and the modeling will be improved.

The calibrated steady-state flow model simulations reasonably match water levels and the groundwater inflow rate estimate through different methods is not significantly different.

Some of the limitations of the modeling work are as follows:

- Site specific lithological, well construction, water level data was limited, and additional data from other publicly available documents were also reviewed and used as presented without further validation.

- The steady-state model represents the general hydrogeologic conditions, and variation of input parameters, water levels and water budget with time is not considered in the numerical simulations.

D.3.10 CONCLUSIONS

The results of the model calibration for the steady-state model reasonably matched water levels and the groundwater flow budget measured or estimated for the site. The total inflows projected using the USEPA (USEPA, 2008) empirical method is not significantly different from the seepage rate estimated numerically. The total flow rates into the reservoir are assessed for each scenario and are reported in Table D3-8.

The results of the numerical simulations are based on simplifications of the actual field condition. The actual dewatering rates are expected to be around the approximated inflow rates but may be higher or lower by some amount.

D.4 REFERENCES

Anderson, M.P, and Woessner, W. W., 1992, Applied Groundwater Modeling, Simulation of Flow and Advective Transport, Academic Press, Inc.

ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils, ASTM International, West Conshohocken, PA, 2007, www.astm.org

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

Carman, P.C. (1938). "The determination of the specific surface of powders", J. Soc. Chem. Ind. Trans., 57, 225.

Carman, P.C. (1956). Flow of gases through porous media, Butterworths Scientific Publications, London.

Doherty, J 2010b. PEST Model Independent Parameter Estimation User Manual: 5th Edition. Watermark Numeric. Document can be found via the following website address: http://www.pesthomepage.org/Downloads.php

ESI (Environmental Simulations), Inc. 2020. Guide to Using Groundwater Vistas, Version 6. pp 213. Prepared by Environmental Simulations, Inc., Reinholds, VA.

Fugro West (2002). "Preliminary Geotechnical and Hydrogeologic Study at the Approximate 378-Acre Property known as Hannah Ranch, Tulare County, California", August.

Harbaugh, A.W. (2005) MODFLOW-2005, the U.S. Geological Survey Modular Ground-Water Model—The Ground-Water Flow Process. U.S. Geological Survey Techniques and Methods 6-A16.

Hazen A. (1892). "Some physical properties of sands and gravels with special reference to their use in filtration", 24th Annual Report Massachusetts State Board of Health, Pub. Doc. No. 34, pgs 593-556.

Hazen A. (1911). "Discussion of 'Dams on sand foundation' by A.C. Koenig", Trans. Am. Soc. Civ. Eng., 73, pgs 199-203.

Kenneth D. Schmidt and Associates, 2012 Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project

Kozeny, J. (1927). "Ueber kapillare Leitung des Wassers im Boden", Wien, Akad, Wiss., Ajad, Wiss., 136(2a), pg 271.

Luhdorff and Scalmanini (1995). “Impact Analysis Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California”, Report, August.

McDonald, M. and Harbaugh, A.W. (1988) A Modular Three-Dimensional Finite Difference Ground-Water Flow Model. In: Techniques of Water-Resources Investigations, Book 6, U.S. Geological Survey, 588.

Seep/W (2012). Seepage Modeling with SEEP/W 2012 An Engineering Methodology GEO-SLOPE International Ltd.”

Seequent Limited, 2020, Leapfrog Works version 4.0.1 3D geological modeling.

SLR, 2021a McKay Point Reservoir Project – Geology and Soils Technical Study, November, 2021

U.S. EPA, "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems", EPA 600/R-08/003, January 2008.

FIGURES

Figure D3-1. Leapfrog-Generated Modflow Grid (Domain)

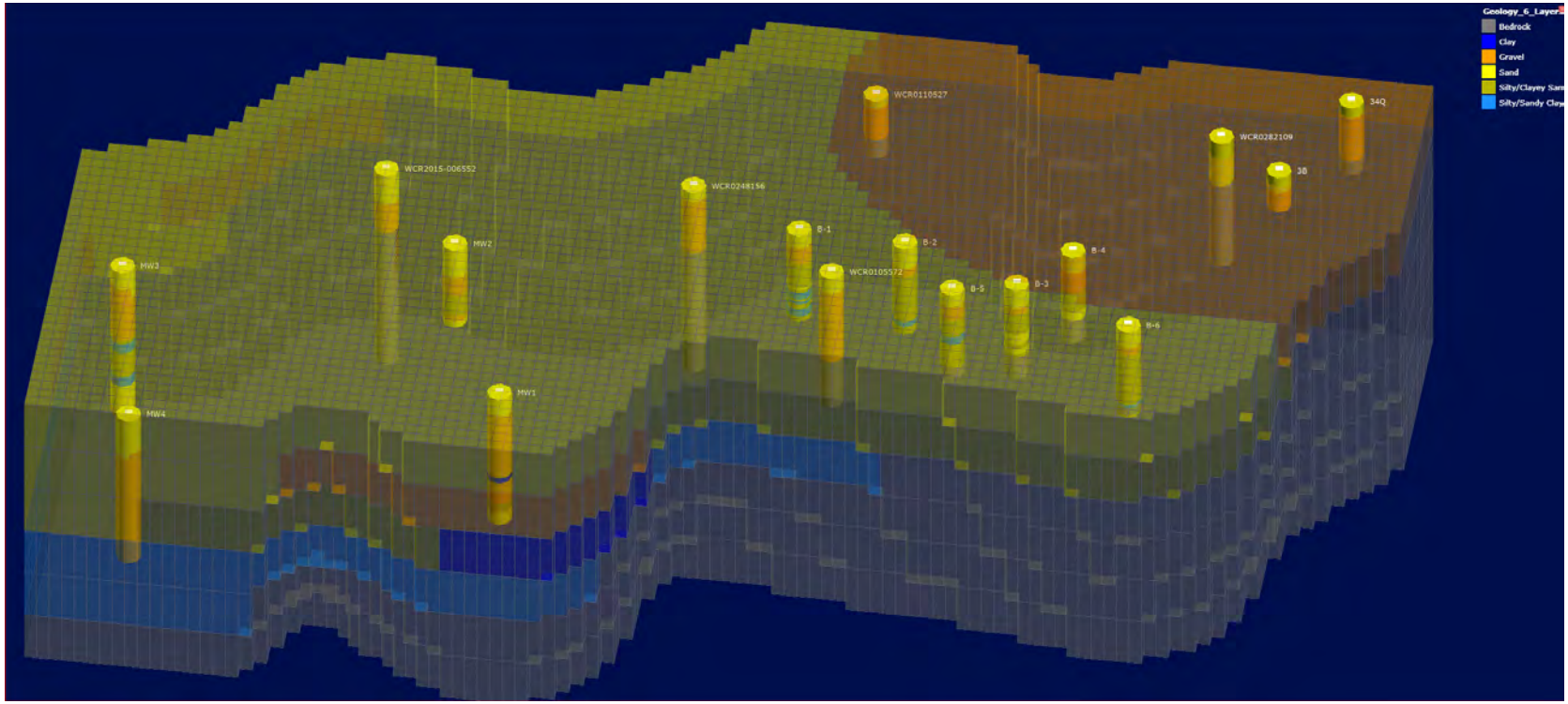


Figure D3-2. Leapfrog-Generated Modflow Six Layers (Domain, Cross-sectional view, Vertical Exaggeration X5)

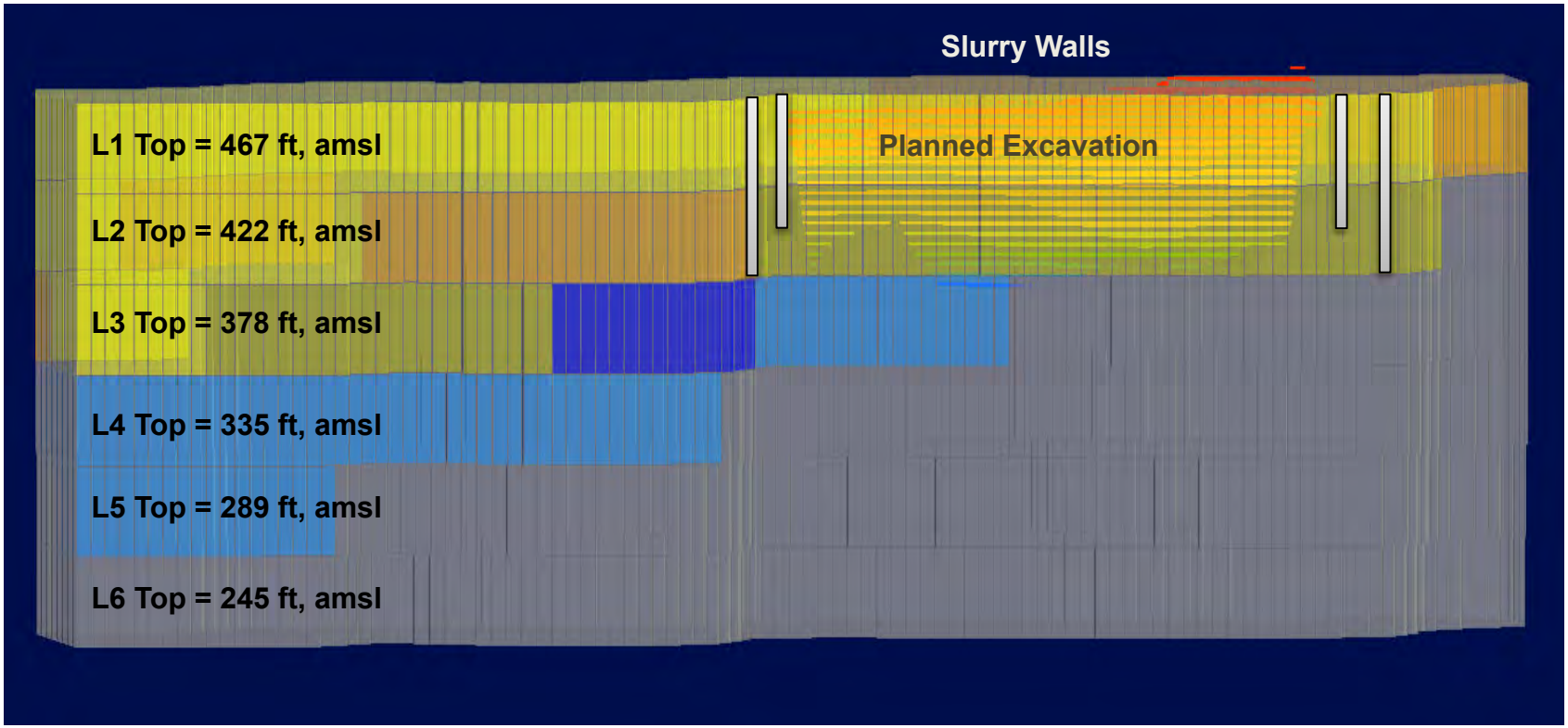


Figure D3-2. Leapfrog-Generated Modflow Six Layers (Domain)

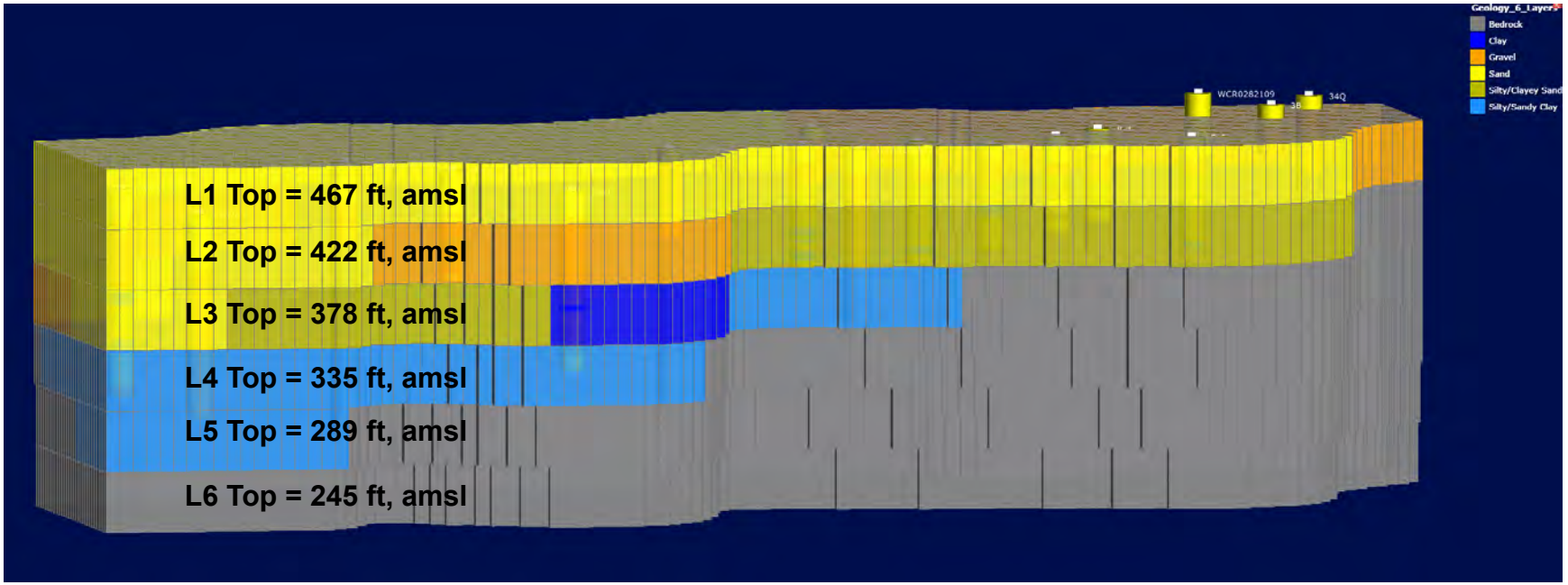


Figure D3-3 Potentiometric Surface- Natural Condition [ft, amsl, Vertical Exaggeration X5]

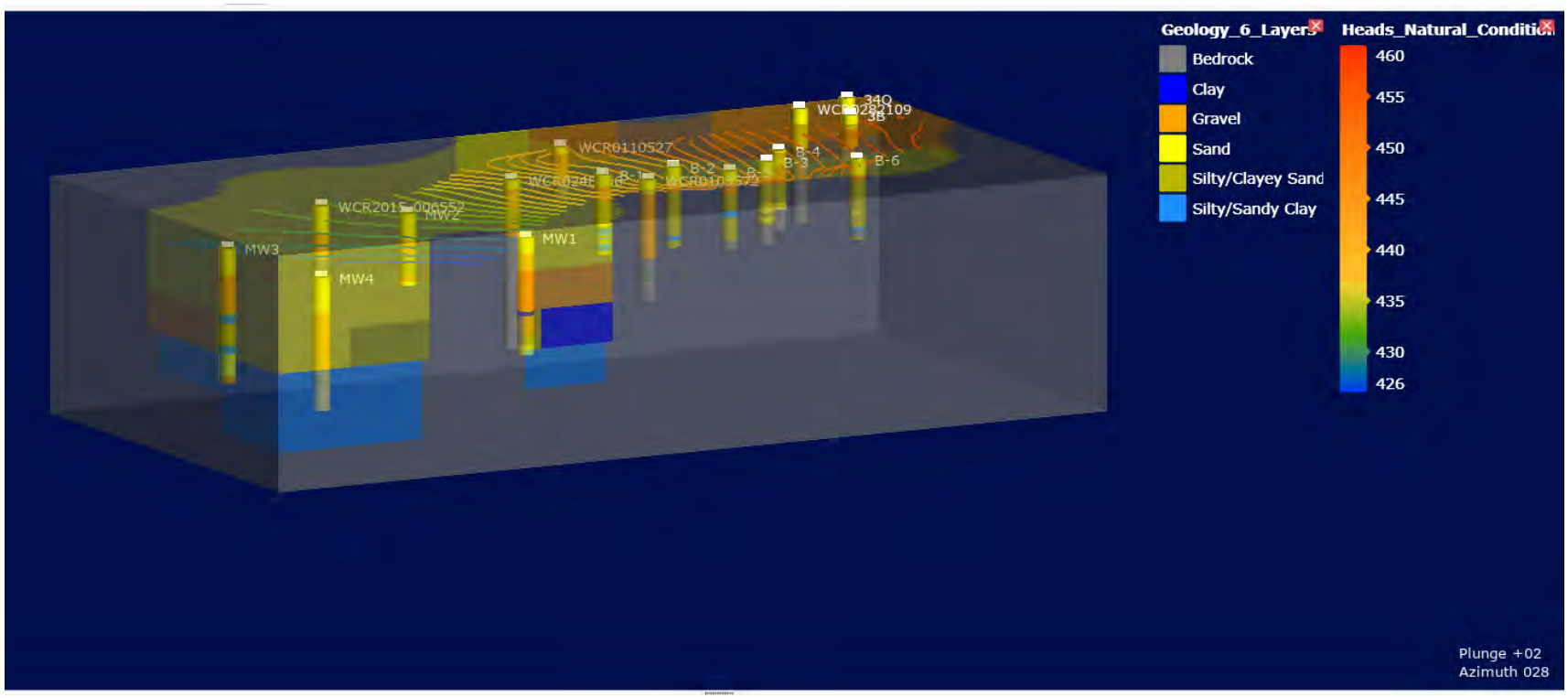


Figure D3-4 Potentiometric Surface Resulting from the Placement of the Reservoir [Scenario 1; Vertical Exaggeration X5, ft, amsl]

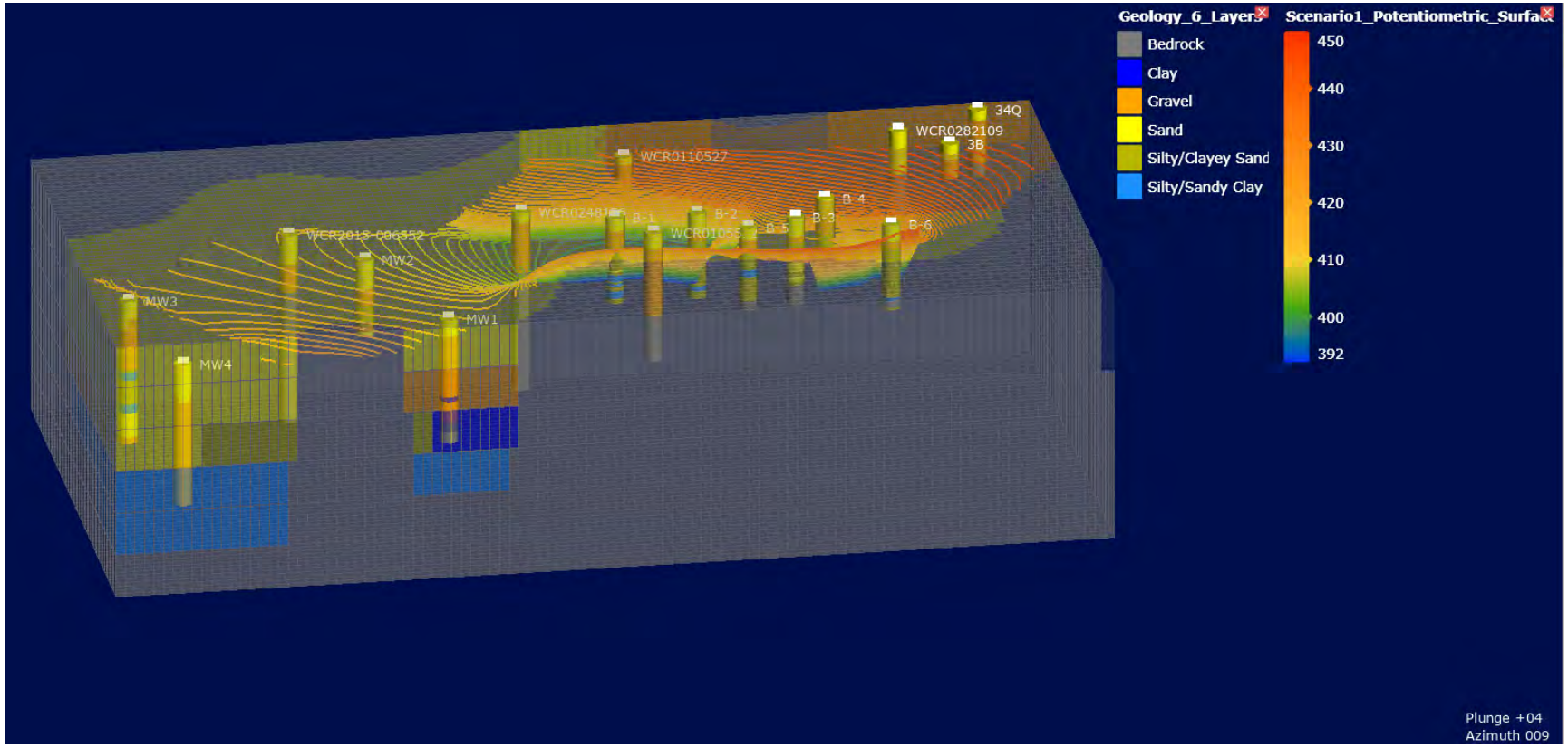


Figure D3-5a Water Levels Comparison in Layer 1 [Scenario 1 vs. Natural Condition, Cross-sectional and Map views, ft, amsl]

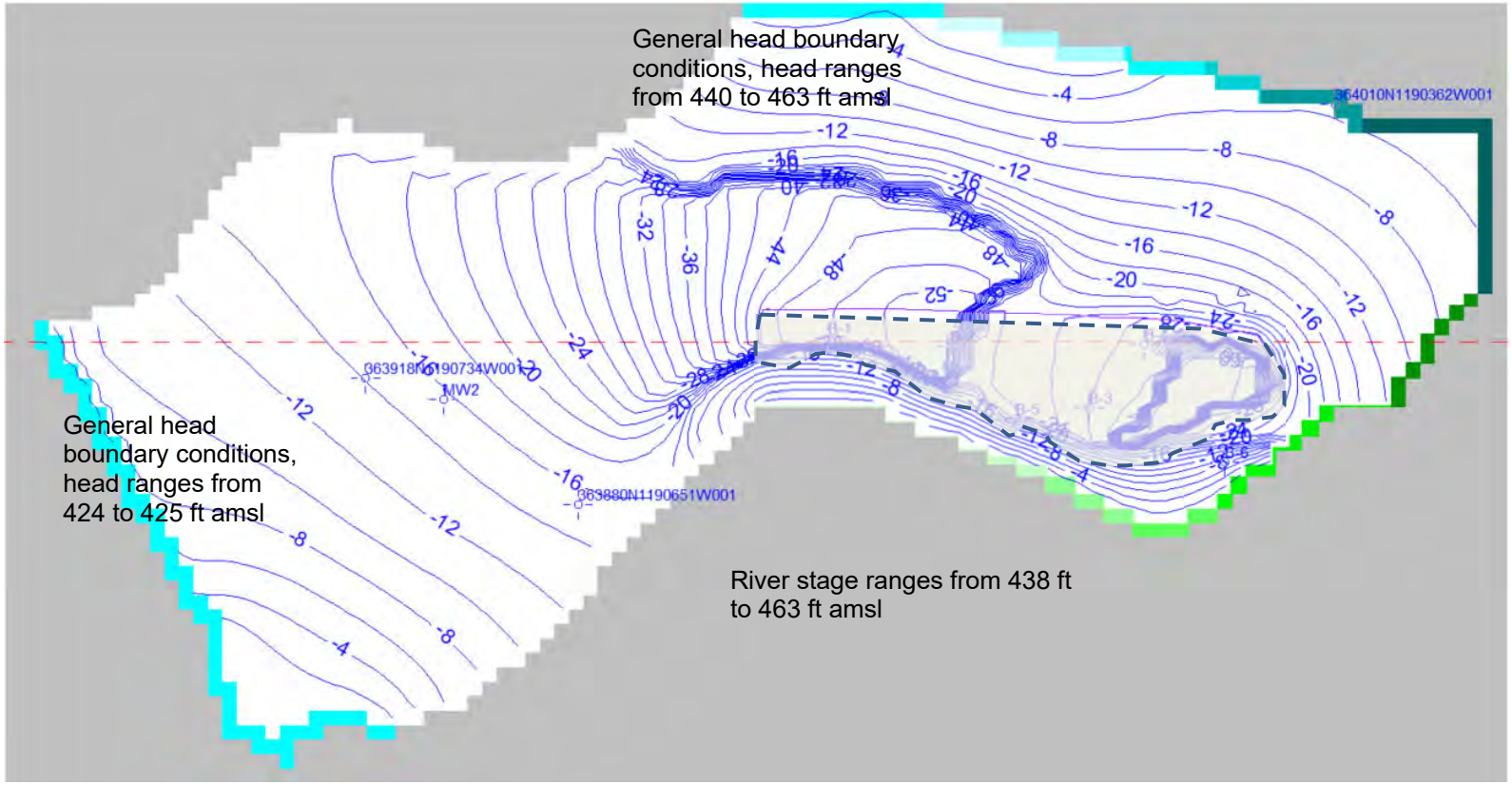


Figure D3-5b Water Levels Comparison in Layer 2 [Scenario 1 vs. Natural Condition, Cross-sectional and Map views, ft, amsl]

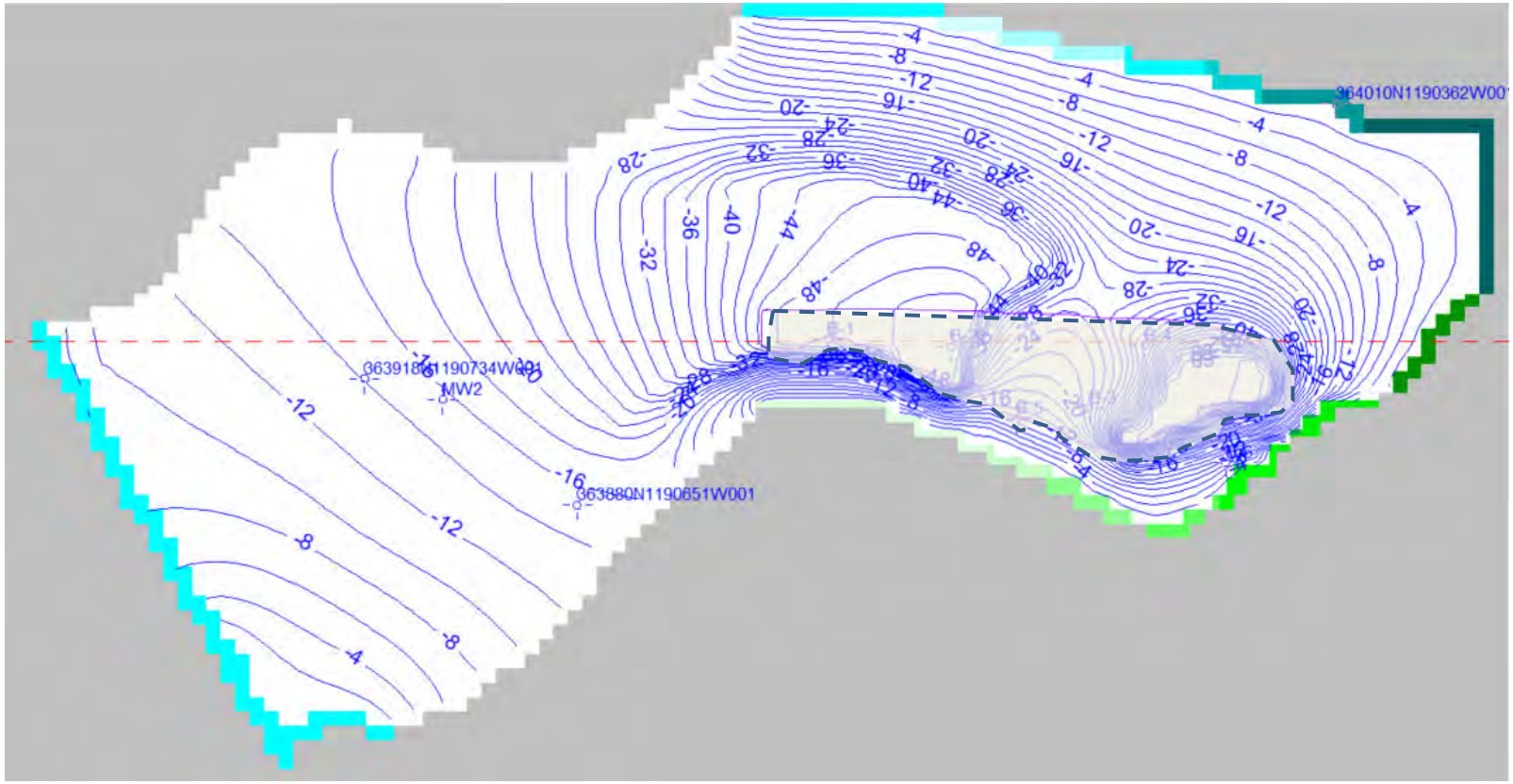


Figure D3-6 Potentiometric Surface Resulting from the Placement of the Reservoir and Slurry Walls [Scenario 2; Vertical Exaggeration X5, ft, amsl]

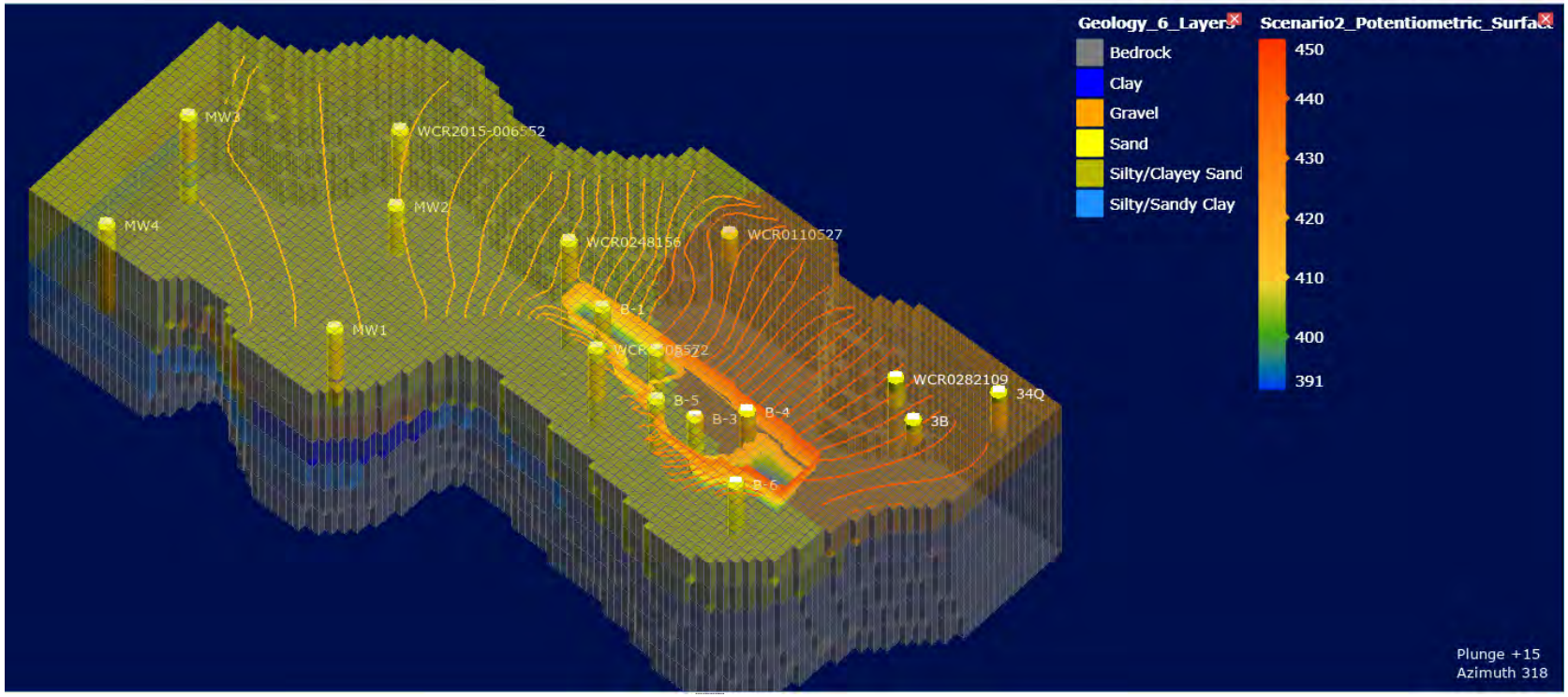


Figure D3-7a Water Levels Comparison in Layer 1 [Scenario 2 vs. Natural Condition Water Levels, Map view, ft, amsl]

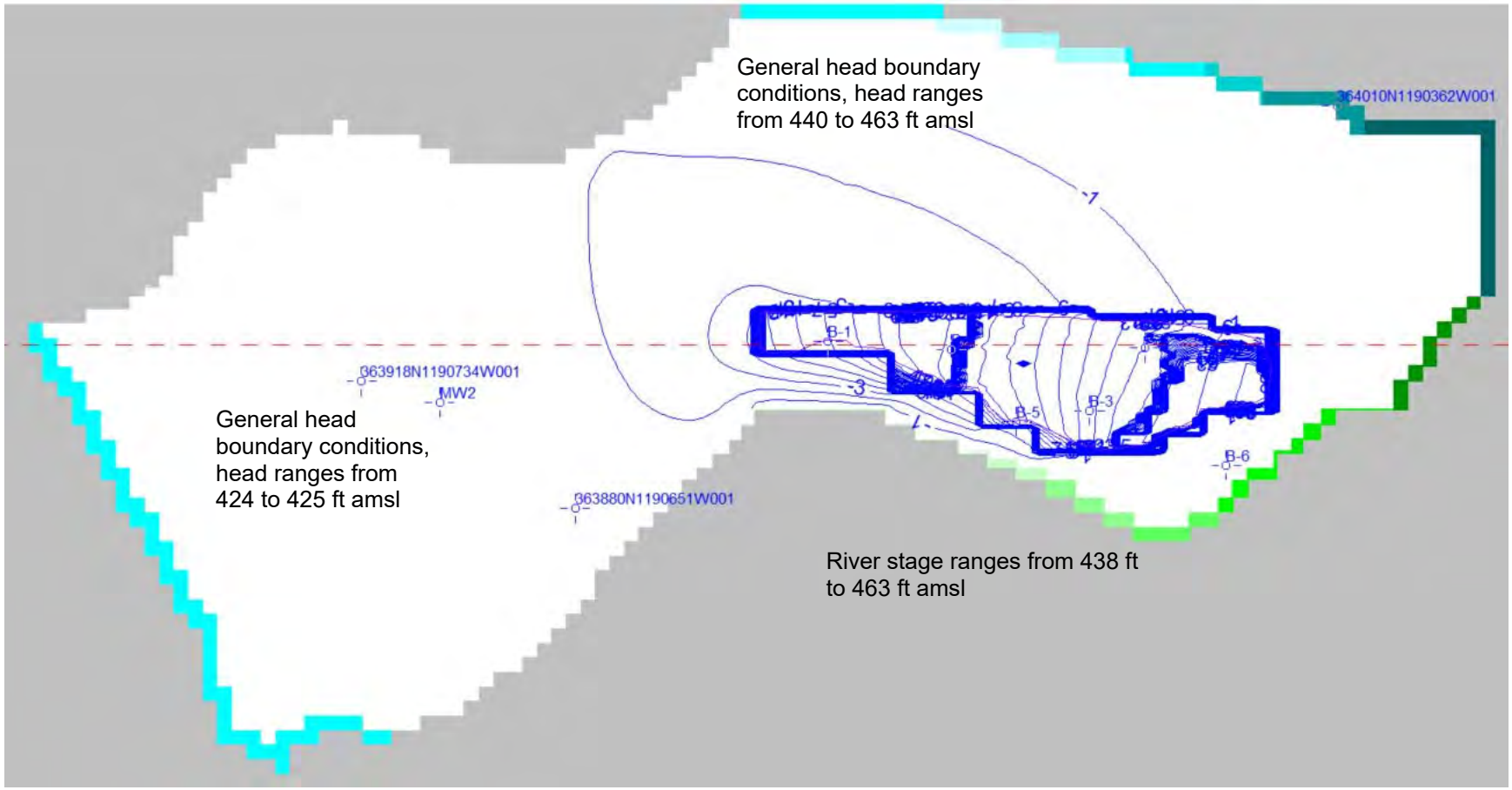


Figure D3-7b Water Levels Comparison in Layer 2 [Scenario 2 vs. Natural Condition Water Levels, Map view, ft, amsl]

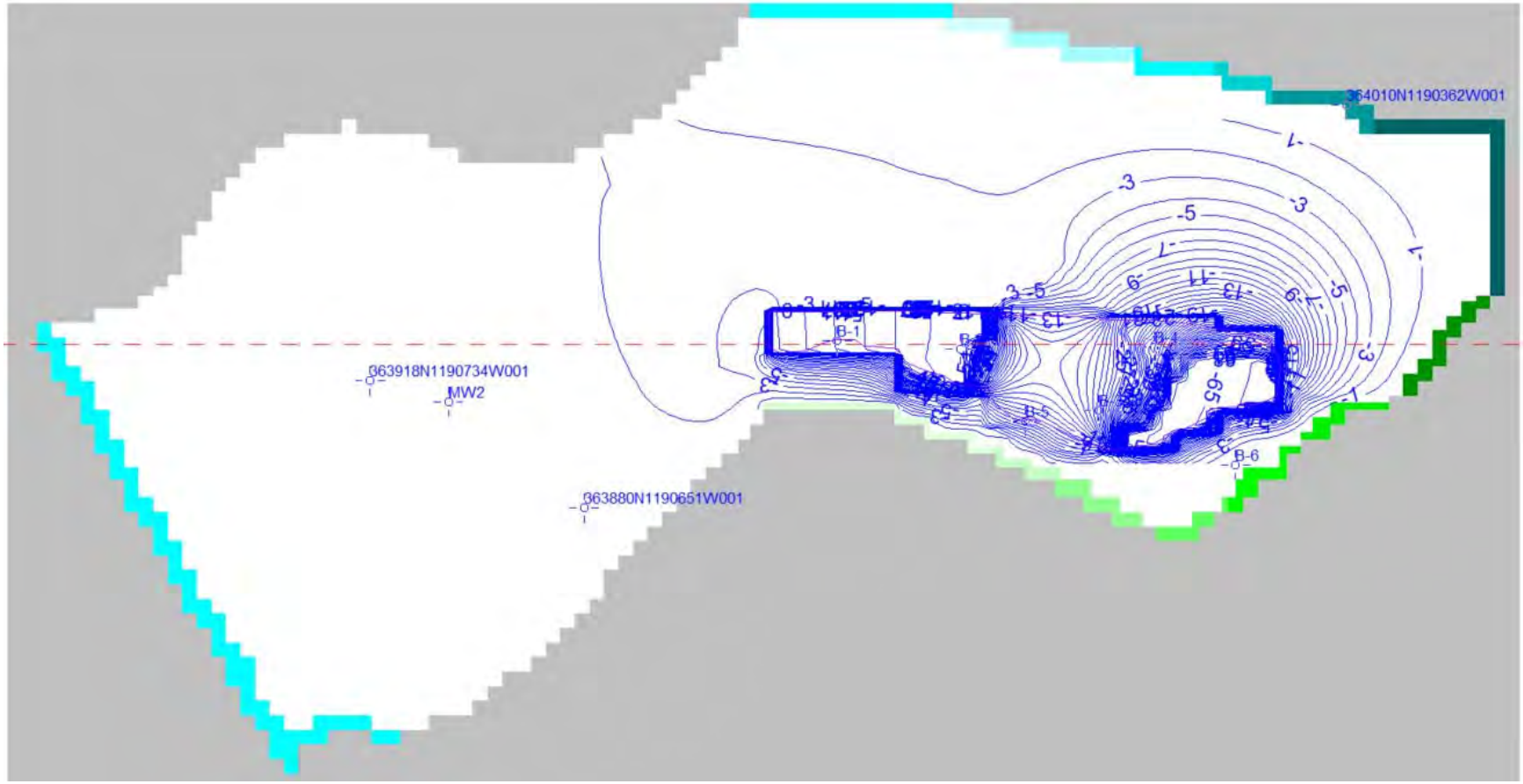


Figure D3-8 Potentiometric Surface Resulting from the Placement of the Reservoir, Slurry Walls and Infiltration Trench [Scenario 3; Flux of ~ 70 gpm, Vertical Exaggeration X5, ft, amsl]

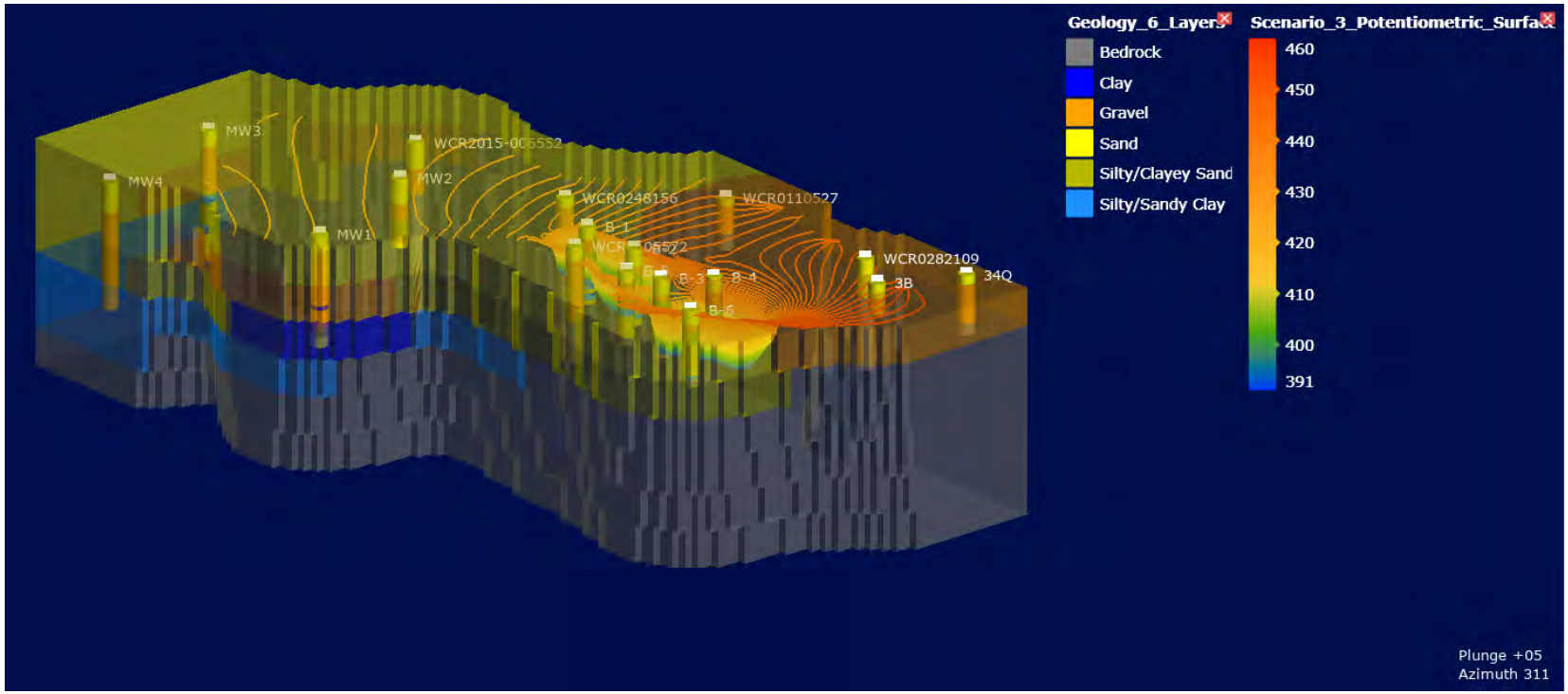


Figure D3-9a Water Levels Comparison in Layer 1 [Scenario 3 vs. Natural Condition, Map view, ft, amsl]

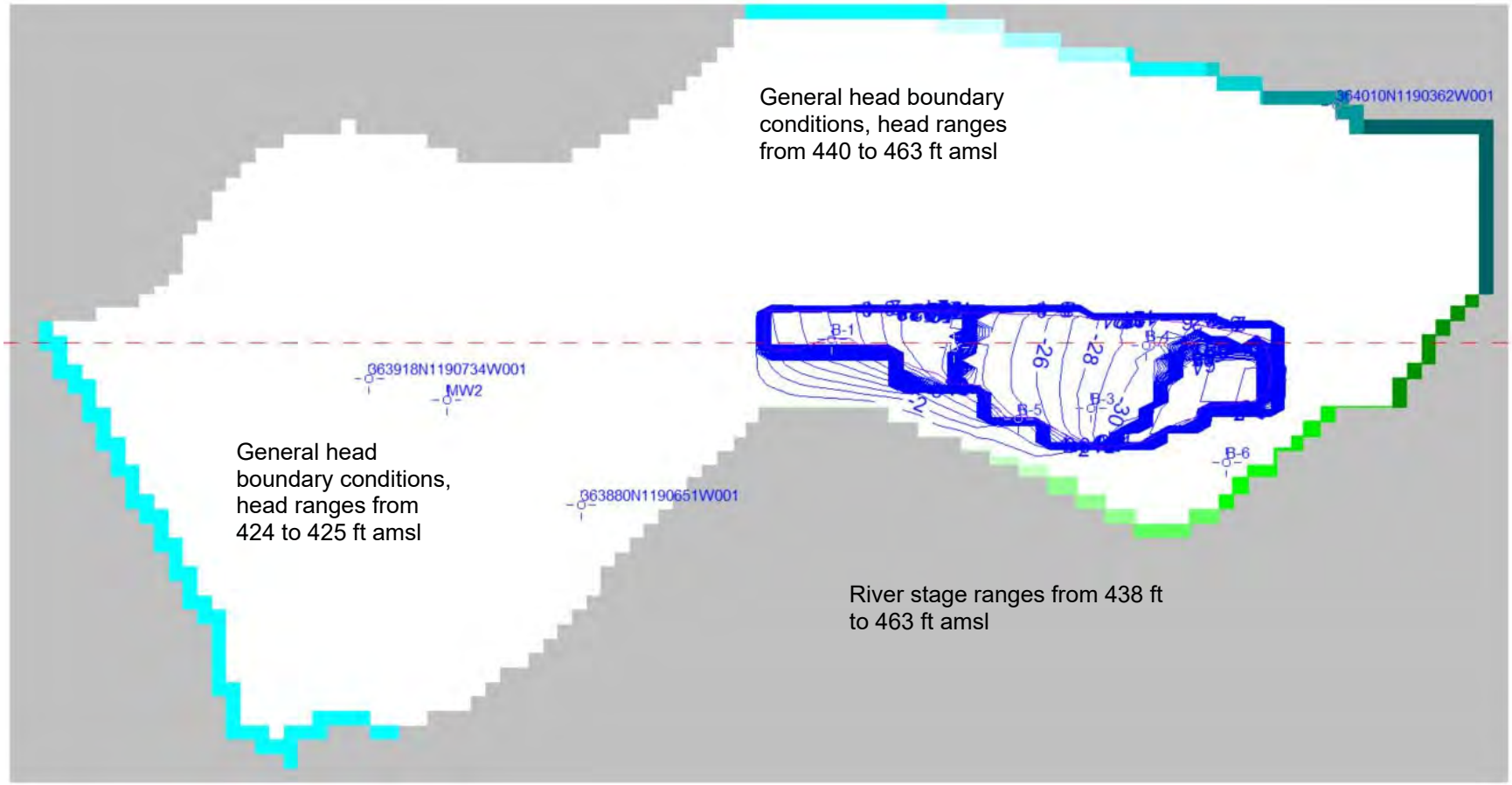
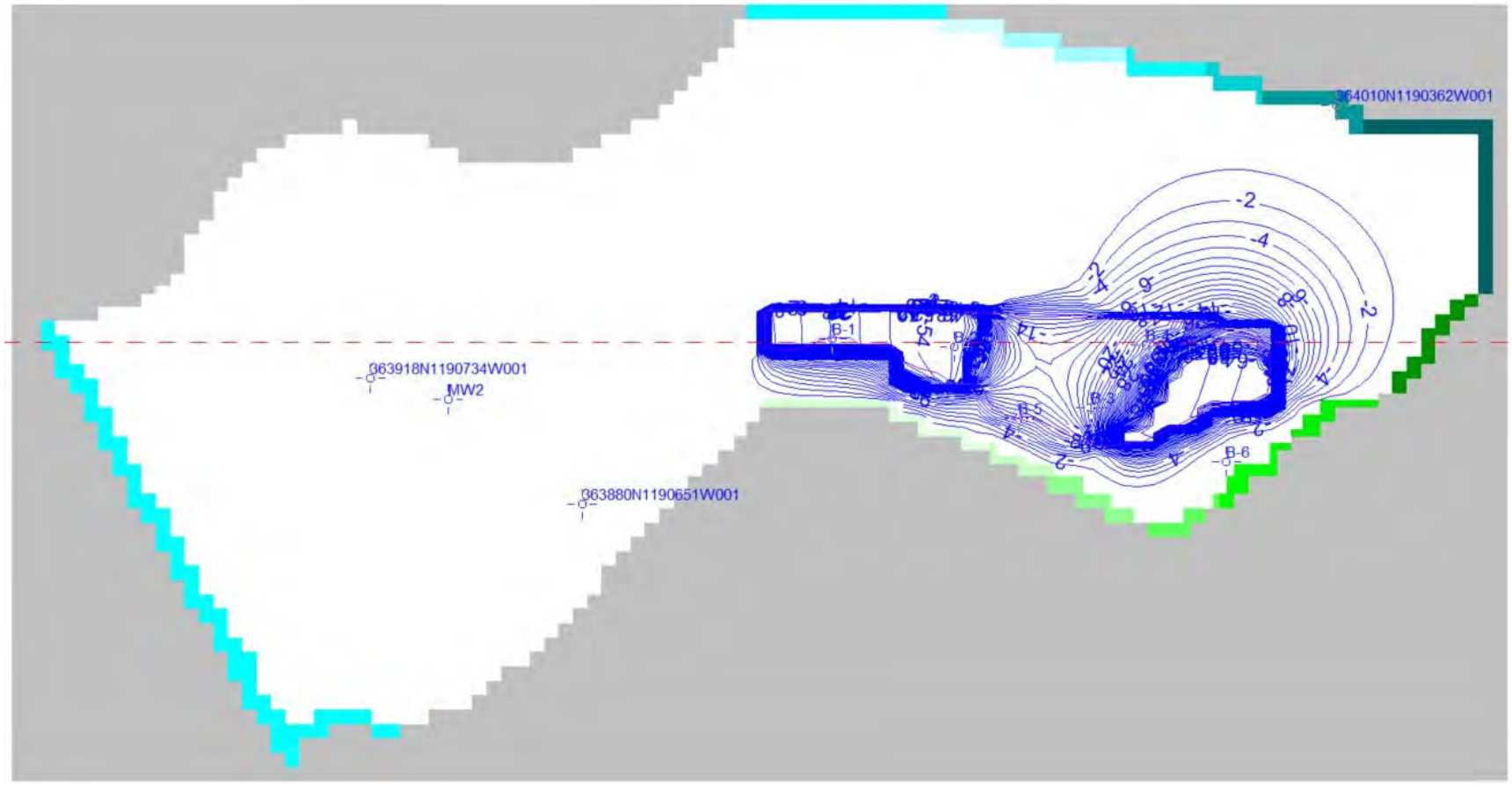


Figure D3-9b Water Levels Comparison in Layer 2 [Scenario 3 vs. Natural Condition, Map view, ft, amsl]



APPENDIX D

Biological Resources Report – McKay Point Reservoir Project
(Bumgardner Biological Consulting – 2013 & 2021)

Tulare Irrigation District
McKay Point Reservoir
Biological Resources Report,
Tulare, California



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October 14, 2013

Tulare Irrigation District
McKay Point Reservoir Project Biological Resources Evaluation,
Tulare County, California

Introduction

This report summarizes the results of year 2011 and 2013 reconnaissance-level biological resources surveys conducted within and immediately adjacent to the site of the proposed McKay Point Reservoir (i.e., project site) in Tulare County, California (Figure 1). The project site lies 2.5 miles southwest of Lake Kaweah; 1.5 miles southeast of Bravo Lake; 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southwest of the community of Woodlake.

The Tulare Irrigation District (TID), Consolidated Peoples Ditch Company (CPDC) and Visalia & Kaweah Water Company (VKWC)) are joint owners of the approximately 200 acres of land adjacent to the Kaweah and St. Johns rivers that comprise the project site. This land is commonly referred to as the McKay's Point property.

The joint owners propose to construct a new reservoir (i.e., McKay's Point Reservoir) on the north side of the divergence of the Kaweah and St. Johns rivers near McKay's Point. The McKay's Point Reservoir will serve as a surface water storage/re-regulation facility (i.e., surface water management tool). The reservoir would occupy a surface area of approximately 180 acres and would have storage capacity of approximately 4,000 acre-feet. Depths of approximately 60 feet below ground surface (bgs) are proposed. Final slopes would be 3:1, horizontal:vertical (h:v), in order to minimize any bank erosion from the wind and water.

The project site and immediately adjacent lands within 250 feet of the site were evaluated during the biological resources survey to identify evidence of special-status plants and wildlife, rare or sensitive vegetation communities, and potential jurisdictional waters or wetlands that could be affected by the proposed project.

Survey Methods

The project site and adjacent lands were surveyed by Michael Bumgardner (Bumgardner Biological Consulting) on May 16, 2011 and September 18, 2013. The surveys were conducted on foot as random meander transects such that all portions of the project site could be effectively evaluated. Gross-scale mapping of the plant communities on the project site was conducted given that only three discernible communities occur on the site. A search for special-status plant and wildlife species was conducted and focused on local taxa that have been recorded in the California Natural Diversity Data Base (CNDDB) or California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants. Lastly, a reconnaissance-level search for waters with regulatory jurisdiction under the Clean Water Act, California Fish and Game Code, and/or Porter-Cologne Water Quality Control Act was conducted within the site boundaries.

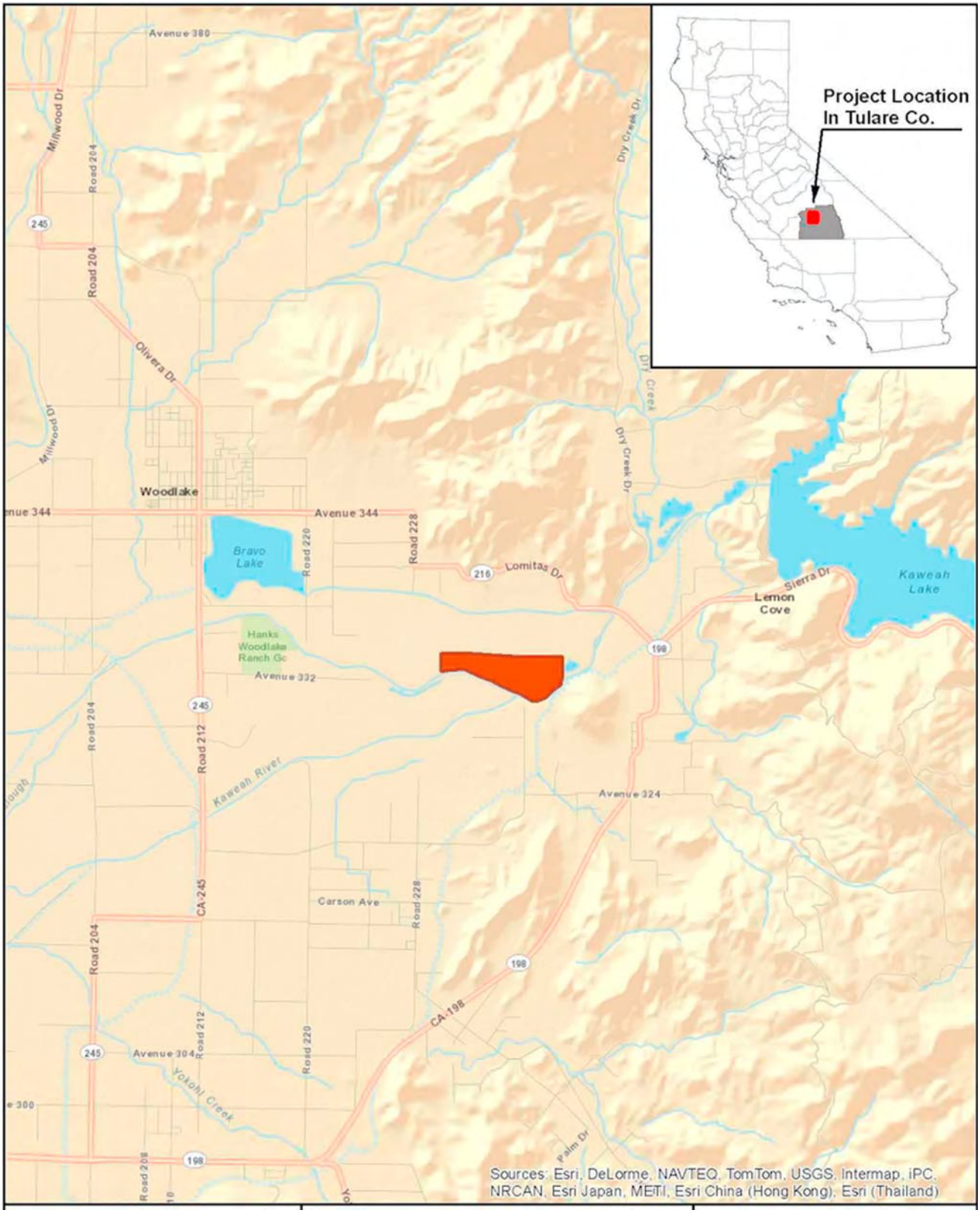


Figure 1
McKay Point Reservoir Project Site – Tulare County, California

Analytical Methods

A standard nine-quadrangle CNDDB/Rarefind 3 report was generated for the project site (i.e., query of the USGS 7.5-minute topographic quadrangle in which the project site is found as well as the immediate eight surrounding topographic quadrangles, viz. Woodlake and the surrounding Stokes Mtn., Ivanhoe, Exeter, Aukland, Rocky Hill, Shadequarter Mtn., Kaweah, and Chickencoop Canyon quads. The California Natural Diversity Data Base (CNDDB) contains records for special-status species, as well as sensitive natural communities, which have been reported to the California Department of Fish and Wildlife (CDFW). The Rarefind 3 report for the project site is provided in Appendix A. Each of the species identified in the Rarefind 3 report were then evaluated in terms of their likelihood of occurrence within and immediately adjacent to the project site. This evaluation considered the known distribution and habitat requirements of the species such that one of the following findings was prepared:

- Known to Occur – species was observed within or immediately adjacent to the project site during the May 16, 2011 survey or September 18, 2013 survey or has previously been documented within or immediately adjacent to the project site.
- High Potential – species has not been documented within or immediately adjacent to the project site, but should be expected on more than 50% of visits to suitable habitat in the project site during the appropriate season and time of day.
- Moderate Potential – species has not been documented within or immediately adjacent to the project site, but should be expected on less than 50% of visits to suitable habitat in the project site during the appropriate season and time of day.
- Low Potential – species has not been documented within or immediately adjacent to the project site nor is it likely to occur on the project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
- No Potential – species does not occur within the project site due to the lack of required habitat features for the species or the known range of the species is well defined and does not include the project site.

The findings for each of the species identified in the Rarefind 3 report are presented in this report.

Other sources of information on special-status species in California were subsequently reviewed given that the CNDDB is not inclusive of all special-status species that may occur in an area. A review of the CDFW's List of Special Animals (January 2011) and List of Special Plants (July 2013) was therefore conducted to determine if any special-status species not identified in the Rarefind 3 report have the potential to occur in the project site. This review was based on the professional experience of Michael Bumgardner within the region and elsewhere in California, but also included review of

other published sources of information on special-status species in California. These latter sources include the following:

- California Native Plant Society Inventory of Rare and Endangered Plants (online edition) (CNPS 2013).
- The Jepson Manual: Vascular Plants of California, 2nd edition (Baldwin and Goldman 2012).
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994).
- The Distribution of the Birds of California (Grinnell and Miller 1944).
- California Birds: Their Status and Distribution (Small 1994).
- California's Wildlife Volume II Birds (Zeiner et al. 1990).
- eBird Data Base (http://ebird.org/ebird/eBirdReports?cmd=Start) (2013).
- Mammalian Species of Special Concern in California (Williams 1986).
- Mammals of the Pacific States: California, Oregon, and Washington (Ingles 1978).
- Bat species accounts prepared as course materials for *Ecology and Conservation of California Bats* offered through San Francisco State University's Sierra Nevada Field Campus.
- Western Bat Working Group website (http://www.wbwg.org/species_accounts).

Species that are known or expected to occur in the vicinity of the project site were then further evaluated in this report.

Vegetation Communities and Site Characteristics

The project site is located immediately north of the divergence of the Kaweah and St. Johns rivers. The site is flat and has been used most recently to support cattle grazing. There are no developed uses on the site. Much of the onsite vegetation consists of non-native annual grassland (Figure 2). As such, most of the vegetation consists of non-native annual grasses [e.g., wild oat (*Avena fatua*)], but also includes herbaceous species such as lamb's-quarters (*Chenopodium album*), wild cucumber (*Marah* sp.), and deer weed (*Acmispon glaber*). Small, scattered stands of mule fat (*Baccharis salicifolia*) also occur within the non-native annual grassland. However, these latter stands are not significant enough in size to warrant mapping as a discernible vegetation community.

Mixed oak-riparian woodland occurs in the southeastern portion of the project site (Figure 2). Woody species that are associated with this stand of vegetation include willows (*Salix* spp.), Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizeni*). California wild grape (*Vitis californica*) occurs as a liana growing into the canopy of the woody species. The canopy cover in this stand of vegetation varies between approximately 20 and 100 percent and is best described as interrupted woodland.



Figure 2
McKay Point Reservoir Project Site – Vegetation Communities

Approximately 39.8 acres of elderberry savannah-riparian woodland (a sensitive vegetation community tracked by the CDFW) occurs adjacent to the mixed oak-riparian woodland, but also extends west along the southern border of the project site (Figure 2). It should be noted that the depicted boundaries in Figure 2 are an approximation of the borders of this vegetation community and the mixed oak-riparian woodland as the two communities have no clearly discernible boundary where they occur adjacent to and grade into each other. The dominant species in the elderberry savannah-riparian woodland is blue elderberry. However, scattered Fremont's cottonwoods and willows also occur in this vegetation community. The onsite elderberry shrubs/clumps are large and old with many stems and likely represent the remnants of a formerly more contiguous community.

Jurisdictional Wetlands and Other Waters

Jurisdictional wetlands or other waters of the United States are areas that cannot be dredged or filled without a permit from the U.S. Environmental Protection Agency or U.S. Army Corps of Engineers (this latter permit is commonly referred to as a "Section 404" permit in reference to the section of the federal Clean Water Act that requires such permits). Actions that require issuance of a "Section 404" permit include earth-moving activities that result in fill of jurisdictional wetlands and other waters. It should be noted that such actions may also require the issuance of state permits (e.g., California Fish and Game Code Section 1603 streambed alteration agreement and/or Regional Water Quality Control Board Section (RWQCB) Section 401 clean water certification).

Wetlands or other waters of the United States are identified based on three criteria, viz. (1) soil characteristics, (2) hydrology, and (3) plant species. The U.S. Army Corps of Engineers (USACE) has developed a procedure and manual for delineating wetlands that requires comprehensive evaluation of these three criteria during field environmental assessments. A formal wetland delineation was not conducted for the purposes of this report. However, no waters that are subject to the jurisdiction of the USACE, CDFW, or RWQCB, other than the Kaweah and St. Johns rivers, occur on or immediately adjacent to the project site. The latter two rivers are jurisdictional waters and the placement of fill associated with the intake/outlet infrastructure of the McKay's Point Reservoir will be subject to the jurisdiction of the USACE, CDFW, and RWQCB.

Habitat Conservation Plans and Other Similar Habitat Management Plans

There are no Habitat Conservation Plans (HCPs), Natural Community Conservation Plans (NCCPs), or other approved local, regional, or state habitat conservation plans that apply to the project site.

Wildlife Diversity

The surveys within and adjacent to the project site resulted in the documentation of relatively low wildlife diversity (i.e., two species of amphibians, one species of reptile, 14 species of birds, and five species of mammals). However, it should be noted that no

comprehensive wildlife surveys were conducted for the project. The only amphibians that were found in and adjacent to the project site included Pacific treefrog (*Hyla regilla*) and bullfrog (*Rana catesbeiana = Lithobates catesbeianus*). Both of these species are relatively widespread in lower elevation drainages, ponds, and other waters in California. The only reptile species recorded within and adjacent to the project site was western fence lizard (*Sceloporus occidentalis*). This species is relatively widespread within the non-desert, lowland portions of California. The bird species recorded within and adjacent to the project site included phainopepla (*Phainopepla nitens*), northern mockingbird (*Mimus polyglottos*), Nuttall's woodpecker (*Picoides nuttallii*), American robin (*Turdus migratorius*), willow flycatcher (*Empidonax traillii*), Pacific-slope flycatcher (*E. difficilis*), house finch (*Haemorhous mexicanus*), western scrub-jay (*Aphelocoma californica*), Anna's hummingbird (*Calypte anna*), northern flicker (*Colaptes auratus*), turkey vulture (*Cathartes aura*), killdeer (*Charadrius vociferus*), black phoebe (*Sayornis nigricans*), and California quail (*Callipepla californica*). Most of these species are common and widespread year-round or winter residents within oak and riparian woodlands within the region. However, the willow flycatcher and Pacific-slope flycatcher are only migrants through the area and do not occur as a nesting or wintering species at the project site. Lastly, mammal species documented on and near the project site included California ground squirrel (*Otospermophilus beecheyi*) Botta's pocket gopher (*Thomomys bottae*) (mounds only), (burrows only), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and raccoon (*Procyon lotor*) (tracks only).

It should be noted that other wildlife species probably occur on or near the project site, but would not likely be found in one-day reconnaissance-level surveys. These other species include, but are not limited to, southern alligator lizard (*Elgaria multicarinata*), western skink (*Plestiodon skiltonianus*), common kingsnake (*Lampropeltis getula*), Pacific gopher snake (*Pituophis catenifer*), western rattlesnake (*Crotalus viridis*), several species of small mammals, several species of oak or riparian-associated passerines (i.e., songbirds), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*).

Special-Status Plant Species

No special-status plant taxa were observed on or immediately adjacent to the project site during the surveys. In addition, no special-status plant taxa that have been documented in the project region (Table 1) are considered to have any potential to occur on the project site given the onsite conditions (i.e., lack of suitable habitat for and/or known distribution of the species).

Special-Status Wildlife Species

Only two special-status wildlife species were observed on the project site during the surveys. One of these species (i.e., Nuttall's woodpecker) is a likely year-round resident in the mixed oak-riparian woodland in the southeastern portion of the project site. The second species (i.e., willow flycatcher) was only observed during the September 18, 2013 survey and is considered a migrant that passes through the area (including the project

site). Furthermore, this latter species is only considered a special-status species when nesting (typically in dense willow scrub in the Sierra Nevada).

Sixteen special-status wildlife species that have been documented in the project region (Table 1) are considered to have some potential to occur on or near the project site. Three of these species are insects (i.e., moestan blister beetle, Morrison's blister beetle, and Tulare cuckoo wasp) that are not well known in terms of their life history and behavior, but that have been recorded in the project vicinity in habitats similar to those that occur on the project site. As such, they cannot be discounted and are considered to have some potential, albeit low, to occur on the project site. There is also suitable habitat on the project site for a fourth special-status insect species [i.e., valley elderberry longhorn beetle (VELB)]. However, the nearest known occurrences of the beetle, which occurs in and on elderberry, are more than 4.5 miles southwest and 8.5 miles northeast of the project site. Furthermore, the beetle is known to have poor dispersal abilities and does not occur in large sections of elderberry savannah or riparian habitat that is otherwise suitable for the species other than it is isolated by reaches of unsuitable habitat (i.e., gaps in the suitable habitat as small as 300 linear feet). Though no exit holes attributable to VELB were found during the reconnaissance-level surveys of the project site, it should be noted that focused surveys for VELB exit holes would need to be conducted to support a finding of absence. Consequently, the taxon is considered to have some potential, albeit low, to occur on the project site.

Only one special-status reptile is believed to have any potential to occur on the project site. This latter species [i.e., western pond turtle (*Emys marmorata*)] is known from occurrences upstream in the Kaweah River drainage. In addition, it has been known to occur in a wide variety of slow-moving waters throughout California. Thus, it is considered to have some potential, albeit low, to occur in the aquatic habitats of the adjacent Kaweah and St. Johns rivers and to nest in the upland portions of the project site.

Ten special-status birds are considered to have some potential to occur on the project site. Seven of these latter species [Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), oak titmouse (*Baeolophus inornatus*), yellow-breasted chat (*Icteria virens*), lark sparrow (*Chondestes grammacus*), and Lawrence's goldfinch (*Spinus lawrencei*)] are known to nest in oak or riparian woodlands. Furthermore, each of these species has been recorded nesting within less than two miles of the project site. As such, each of these species, with the exception of oak titmouse is considered to have some potential, albeit low, to nest in the onsite mixed oak-riparian woodland. Given the presence of Nuttall's woodpecker in the mixed oak-riparian woodland, oak titmouse is considered to have a moderate potential to nest onsite since the species is a secondary cavity nester (i.e., nests in cavities/holes created by woodpeckers).

Other special-status bird species with some potential to occur on the project site include ferruginous hawk (*Buteo regalis*), merlin (*Falco columbarius*), and burrowing owl (*Athene cunicularia*). No evidence of burrowing owl was found on the project. In addition, no suitable burrows or burrow surrogates that could be used by the species were

found on the project site. However, California ground squirrel burrows were observed immediately offsite on the northern and eastern boundaries of the project site. As such, there is the potential for indirect impacts to the species at these off-site locations should they be occupied by the species. Ferruginous hawk and merlin do not occur in the project region as nesting species. However, they do occur in the area as wintering species and are considered special-status species when wintering. Given the presence of suitable habitat onsite (i.e., large tract of non-native grassland) and known winter occurrences within less than two miles, these two species are considered to have some potential, albeit low, to occur on the project site.

Only one special-status mammal is believed to have any potential to occur on the project site. Western red bat (*Lasiurus blossevillii*) is known to utilize large trees in riparian forest or orchards as roost sites. Therefore, the species is considered to have some potential, albeit low, to occur in the mixed oak-riparian woodland located on the project site.

Conclusions

Sensitive or special-status biological resources that could be adversely affected by the proposed McKay's Point Reservoir Project are limited to the following:

- elderberry savannah-riparian woodland (a sensitive vegetation community);
- Kaweah and St. Johns rivers (jurisdictional waters of the state and United States); and
- special-status wildlife species (up to 16 species).

Elderberry savannah is a sensitive vegetation community that is tracked by the CDFW. It is poorly represented in the CNDDB, but is known to occur throughout the Central Valley in small stands. Approximately 39.8 acres of this vegetation community would be adversely affected by the project.

Fill within the Kaweah and St. Johns rivers would occur with construction of each river's inflow and outflow channels and associated rip-rap or concrete aprons. This fill would require permitting from the USACE, CDFW, and RWQCB.

Adverse effects to up to 16 special-status wildlife species could occur with construction and operation of the project. Approximately half of these species are birds that may nest in the mixed oak-riparian woodland in the southeastern portion of the project site. The project would not result in direct effects to these species (i.e., loss of habitat), but could result in indirect effects (e.g., significant disturbance during nesting from nearby construction activities). The project could result in direct effects to burrowing owl even with no suitable roost sites on the project site since the loss of suitable foraging habitat could adversely affect individuals occupying adjacent lands. The project could also result in indirect effects to burrowing owls occupying adjacent offsite lands due to disturbance from nearby construction activities. The loss of foraging habitat for wintering merlin and ferruginous hawk would contribute to the cumulative loss of

suitable winter foraging habitat for these species. The remaining special-status species addressed by this report (i.e., insects and western pond turtle) could each experience adverse direct effects from loss of habitat. Furthermore, potential direct effects to western pond turtle could include loss of individuals (adults and eggs) during construction-related activities.

No other important, significant, sensitive, or regulated biological resources (including aquatic habitats, roost sites, staging areas, etc.) were found to be associated with the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
		PLANTS		
Atriplex cordulata var. *erecticaulis*	Earlimart orache	none/none/CNPS list 1B.2	This annual saltbush occurs on saline or alkaline soils in valley and foothill grassland. It is known from Kings, Kern, and Tulare counties. It blooms from August to November.	**No Potential.** No individuals of this taxon were observed within or near the project site. In addition, the taxon only occurs on saline or alkaline soils in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the taxon has no potential to occur within the project site.
Atriplex minuscula	lesser saltscale	none/none/CNPS list 1B.1	This annual saltbush grows in sandy alkaline areas in chenopod scrub, playas, and valley and foothill grassland. It is known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties. It blooms from May to October.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on sandy alkaline soils in chenopod scrub, playas, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Atriplex persistens	vernal pool smallscale	none/none/CNPS list 1B.2	This annual saltbush occurs in claypan and alkaline vernal pools and alkaline grasslands. It has been recorded from	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			Colusa, Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties. It blooms from June to October.	occurs in claypan and alkaline vernal pools and alkaline grasslands – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Brodiaea insignis	Kaweah brodiaea	none/SE/CNPS list 1B.2	This perennial bulbiferous herb occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland. It is known only from the Tule and Kaweah river drainages in Tulare County. It blooms from April to June.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Chamaesyce hooveri	Hoover's spurge	FE/none/CNPS list 1B.2	This species occurs in vernal pools in valley and foothill grassland (mostly in the northern Sacramento Valley), but has been found in Butte, Glenn, Colusa, Merced, Stanislaus, Tehama, and Tulare counties. It blooms from July to October.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs vernal pools in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Delphinium recurvatum	recurved larkspur	none/none/CNPS list 1B.2	This perennial herb occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland. It is known from Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, Sutter, and Tulare counties. It blooms from March to June.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Eriogonum nudum var. *murinum*	mouse buckwheat	none/none/CNPS list 1B.2	This perennial herb occurs on sandy soils in chaparral, cismontane woodland, and valley and foothill grassland. It known from only 11 occurrences – all in Tulare County. It blooms from June to November.	**No Potential.** No individuals of this taxon were observed within or near the project site. The taxon occurs on sandy soils in valley and foothill grassland – conditions that exist within the project site. However, all known records are from the Three Rivers area well upstream in the Kaweah River drainage. Therefore, the taxon is considered to have no potential to occur within the project site.
Eryngium spinosepalum	spiny-sepaled button-celery	none/none/CNPS list 1B.2	This perennial species occurs in wet valley and foothill grassland and vernal pools. Known occurrences have been	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			documented in the San Joaquin Valley (Kern to Stanislaus counties), along the Central Coast (Monterey and San Luis Obispo counties). Blooming occurs from April to May.	occurs in alkaline areas in wet valley and foothill grassland and vernal pools – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Fritillaria striata	striped adobe-lily	none/SE/CNPS list 1B.1	This perennial bulbiferous herb occurs in cismontane woodland and valley and foothill grassland (usually on clay soils). It is known from Kern and Tulare counties. It blooms from February to April.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and valley and foothill grassland (usually on clay soils) – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Glyceria grandis	American manna grass	none/none/CNPS list 2.3	This perennial rhizomatous grass occurs in bogs and fens, meadows and seeps, and marshes and swamps (stream banks and lake margins). It is known from El Dorado, Fresno, Humboldt, Mendocino, Mono, Placer, and Tulare counties. It blooms from June to August.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in bogs and fens, meadows and seeps, and marshes and swamps – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Leptosiphon serrulatus	Madera leptosiphon	none/none/CNPS list 1B.2	This annual herb occurs in cismontane woodland and lower montane coniferous forest. It is known from Fresno, Kern, Madera, Mariposa, and Tulare counties. It blooms from April to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and lower montane coniferous forest – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Mimulus norrisii	Kaweah monkeyflower	none/none/CNPS list 1B.3	This annual herb occurs on carbonate or rocky soils in chaparral and cismontane woodland. It has been found in Fresno and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and chaparral – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Mimulus pictus	calico monkeyflower	none/none/CNPS list 1B.2	This annual herb occurs on granitic soils (often in disturbed areas) in broadleafed upland forest and cismontane woodland. It has been found in Kern and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in broadleafed upland forest – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Orcuttia inaequalis	San Joaquin Valley orcutt grass	FT/SE/CNPS list 1B.1	This grass occurs in vernal pools (typically larger or more persistent pools) within valley and foothill grassland. The remaining populations of this species occur mostly in the southeastern San Joaquin Valley (Fresno, Merced, Madera, and Tulare counties). Historically, the species also occurred in Stanislaus County. It blooms from April to September.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in vernal pools in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Pseudobahia bahiifolia	Hartweg's golden sunburst	FE/SE/CNPS list 1B.1	This species occurs in cismontane woodland and valley and foothill grassland (almost always on shallow, well-drained, fine-textured soils - typically on clay, acidic soils) on the north or northeast facing side of Mima mounds). It has been recorded in Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties. Blooming occurs from March to April.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and valley and foothill grassland on the north or northeast facing side of Mima mounds – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Tuctoria greenei	Greene's tuctoria	FE/SR/CNPS list 1B.1	This grass occurs in the dry bottoms of vernal pools in valley and foothill grassland. It is currently known to occur in Butte, Colusa, Glenn, Merced,	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in vernal pools in valley and foothill

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			Modoc, Shasta, and Tehama counties. Historically, it also occurred in Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties. It blooms from May to September.	grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
INVERTEBRATES				
Branchinecta lynchi	Vernal pool fairy shrimp	FT/none/none	This species occurs primarily in vernal pools (sandstone depression, grass swale, earth slump, or basalt-flow depression pools) in grassland and oak savannah of the Central Valley. However, the species also occurs at a small number of locations in the central Coast Ranges from Monterey County to Santa Barbara County as well as Riverside County.	**No Potential.** There is no suitable vernal habitat within or adjacent (i.e., within 250 feet) to the project site for this species. Therefore, there is no potential for the species to be affected by the project.
Lepidurus packardi	Vernal pool tadpole shrimp	FE/none/none	This species inhabits clear to turbid vernal pools and swales in the Sacramento Valley and northern San Joaquin Valley.	**No Potential.** There is no suitable vernal habitat within or adjacent (i.e., within 250 feet) to the project site for this species. Therefore, there is no potential for the species to occur on the project site or be affected by the project.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Talanites moodyae	Moody's gnaphosid spider	none/SA/none	Little is known and published about this species. However, it has been found in grasslands under rocks (generally serpentine) on rocky mounts, buttes, and hilltops. Only six known occurrences are reported – all from Fresno and Tulare counties.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on rocky mounts, buttes, or hilltops (usually under serpentine rocks) – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Lytta moesta	moestan blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in Fresno, Kern, Madera, Santa Cruz, Stanislaus, and Tulare counties. The CDFW reports that very little is known about the life history and behavior of this species. However, it has been collected from March to September and has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Therefore, it is considered to have some potential, albeit low, to occur on the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lytta morrisoni	Morrison's blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Therefore, it is considered to have some potential, albeit low, to occur on the project site.
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/none/none	This subspecies occurs at scattered locations in the Central Valley and adjacent foothills of the Sierra Nevada and Coast Ranges. It is entirely dependent upon its host plant (i.e., elderberry spp.) and is only found where this shrub occurs (typically in riparian vegetation associations, but occasionally in single, isolated shrubs or stands of the plant).	**Low Potential.** A large number of old-growth elderryberry shrubs occur within the project site. Though no evidence of valley elderberry longhorn beetle exit holes was found during a reconnaissance-level survey of the project site, the subspecies cannot be discounted as occurring on the project site without more thorough surveys. Therefore, it is considered to have some potential, albeit low, to occur on the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Chrysis tularensis	Tulare cuckoo wasp	none/SA/none	This species is known only from a small series of specimens that have been collected in Amador, Fresno, Monterey, and Tulare counties. Cuckoo wasps are nest parasitoids of predatory wasps and sawflies. However, the host species of this species are unknown. Adults have been found from April to June in open, sunny habitats with abundant flowers and small shrubs, where they feed on nectar.	**Low Potential.** Given that predatory wasps and sawflies (i.e., wasp's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Furthermore, the nearest known record to the project site is from immediately north of the intersection of Road 212 and Avenue 344 (less than three miles from the project site). Therefore, it is considered to have some potential, albeit low, to occur on the project site.
AMPHIBIANS				
Ambystoma californiense	California tiger salamander	FT/ST/none	This species is found in annual grassland, oak savannah, and coastal sage scrub adjacent to vernal pools, stock ponds, and ponded reaches of ephemeral streams (aquatic breeding sites). The species is patchily distributed in the Central Valley from Yolo County to Kings County, but also occurs in Alameda and Contra Costa counties south through the interior	**No Potential.** No suitable aquatic breeding habitat for the species occurs within or immediately adjacent to the project site. Furthermore, the nearest known occurrences of the species (at and near the Stone Corral Ecological Reserve east of Yettem) are more than 11 miles west of the project site. Lastly, the onsite soils are very sandy and appear to preclude the creation of burrows by all species other than valley

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			valleys of the Coast Ranges. Disjunct populations occur in Santa Barbara County and Sonoma County.	pocket gopher. Therefore, there are only marginal underground refugia for the species onsite and it is considered to have no potential to occur on the project site.
Batrachoseps regius	Kings River slender salamander	none/SA/none	This species has been found in Fresno County on the south and east sides of the North Fork of the Kings River and at Summit Meadow in the drainage of the South Fork of the Kings River. It has also been found in the drainage of the middle fork of the Kaweah River in Tulare County. It occurs in talus, under rocks and downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest above 1,100 and 8,100 feet in elevation.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species has only been recorded in talus, under rocks, under downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest between 1,100 and 8,100 feet – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Rana boylii	foothill yellow-legged frog	none/CSC/none	This species was historically distributed throughout the foothill portions of the Sierra Nevada and Coast Ranges drainages from the Oregon border to the San Gabriel River (Los Angeles County). The species requires shallow, small to moderate streams (typically perennial waters	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species requires shallow, small to moderate streams (typically perennial waters with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs – conditions that do not exist

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs).	within the project site. Therefore, the species has no potential to occur within the project site.
Lithobates pipiens	northern leopard frog (native populations only)	none/CSC/none	Historical populations of this species in California existed in scattered locations below 6,500 feet in Siskiyou and Modoc counties and in the northern Owens Valley. Individuals of unknown origin were introduced into El Dorado, Kern, Los Angeles, Merced, San Francisco, Sierra, Tehama, and Tulare counties between 1905 and 1970. Several of these introduced populations experienced rapid growth and range expansions before completely disappearing. Except for a small population that is currently present in Merced County, all of these introduced populations have perished. It has been found in grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, reservoirs (generally where there is permanent water with abundant aquatic vegetation).	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the population recorded near Orosi in Tulare County is considered to be an introduced population and is therefore not a special-status species. Therefore, native populations of this species have no potential to occur within the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Spea hammondii	Western spadefoot	none/CSC/none	This species is found in dry habitats (e.g., annual grassland, oak savannah and woodland, and coastal sage scrub) adjacent to vernal pools, stock ponds, and overflow channels of low-gradient drainages within the Central Valley and coastal California from Monterey County to San Diego County.	**No Potential.** No suitable aquatic breeding habitat for the species occurs within or immediately adjacent to the project site. Furthermore, the project site is relatively landlocked by semi-perennial rivers, sand and gravel mining operations, and agricultural uses that would preclude movement of the species onto the site from more suitable habitats located near the site (e.g., lands north of Highway 216). Consequently, the species is considered to have no potential to occur within the project site.
REPTILES				
Emys marmorata	Western pond turtle	none/CSC/none	This species historically occurred throughout most of the Pacific-slope drainages in California (below approximately 4,000 feet). The species now occurs at scattered locations throughout its former range (primarily in the central Sierra Nevada foothills, Central Valley, San Francisco Bay area, and north-central coast and Coast Ranges. It occurs in and adjacent to	**Low Potential.** Given that potentially suitable habitat is provided by the adjacent Kaweah and St. Johns rivers and the species has been recorded upstream in the Kaweah River, it cannot be discounted as occurring on the project site. Suitable aquatic habitat within the project site only occurs in the Kaweah and St. Johns rivers. However, individuals could also enter the upland portion of the site for egg-laying.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			ponds, reservoirs, or other slow-moving perennial aquatic habitats (e.g., sloughs, streams, and rivers). The species may be active year-round in some parts of its range.	Therefore, it is considered to have some potential, albeit low, to occur on the project site.
BIRDS				
Ardea herodias	great blue heron (nesting colony)	none/SA/none	This species is fairly common throughout most of California where there are shallow estuaries, or freshwater or saltwater emergent wetlands. However, it is less common along riverine and rocky coastal shores and above the foothills in the mountains. Rookeries (i.e., nesting colonies) are typically active from February to late July and occur in the tops of secluded large snags or live trees. Rookeries are sometime shared with the great egret or other large wading birds.	**No Potential.** No nesting colonies of this species were observed within or near the project site. In addition, the nearest reported nesting colony is on Dry Creek, one mile north of the confluence of Dry Creek and the Kaweah River (more than two miles from the project site). Therefore, no nesting colonies of this species occur within or immediately adjacent to the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Gymnogyps californianus	California condor	FE/SE/none	This species occurs as a reintroduced species primarily in the mountains of Ventura, Santa Barbara, Los Angeles, Monterey, and San Benito counties. However, individuals are known to be wide-ranging and occasionally occur soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may also be used.	**No Potential.** No suitable roost sites for this species occur within or near the project site. In addition, other potential attractors to the project site (e.g., large mammals and potential food sources) are not provided at or near the site. Lastly, the nearest known use areas for this species are located in more rugged country more than 13 miles southeast of the project site. Therefore, the species is considered to have no potential to occur within the project site.
Accipiter cooperii	Cooper's hawk (nesting)	none/SA/none	This species occurs as an uncommon breeding resident throughout most of the low to mid-elevation wooded portions of California where it inhabits open, interrupted, or marginal woodlands. It is seldom found in areas without dense tree stands. Nest sites are typically found in riparian or	**Low Potential.** There is suitable nesting habitat for the species (i.e., interrupted riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			deciduous trees in canyon bottoms or river flood plains.	upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Buteo regalis	Ferruginous hawk (wintering)	none/none/BCC	This species is a winter resident of the Modoc Plateau, Central Valley, and Coast Ranges. It forages in large, open tracts of grasslands, sparse scrubland, and deserts.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) on the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the project site.
Elanus leucurus	white-tailed kite (nesting)	none/CFP/none	This species is found as a resident throughout the lower elevation portions of California in low rolling grasslands with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. It requires grasslands, meadows, or marshes (for foraging) located near dense-topped trees (for nesting and roosting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Falco columbarius	Merlin (wintering)	none/SA/none	This species winters in California from September to May. It occurs in a variety of low elevation, relative flat habitats that include wooded areas, coastlines, open grasslands, savannah, and the periphery of lakes. It is less often found in open desert. It typically requires dense stands of trees for cover and roosting. It is most often found where there are substantial populations of small birds (the primary prey item).	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) on the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the project site.
Athene cunicularia	Burrowing owl (burrow sites)	none/CSC/BCC	This species is found throughout the Central Valley, in the San Francisco Bay Area, at scattered locations along the coast, and in portions of the desert regions. It is a year-round resident in annual and perennial grasslands or other vegetation communities that support sparse or non-existent tree or shrub canopies.	**Low Potential.** Though the annual grassland on the project site provides suitable foraging habitat for the species, there is no evidence of suitable burrow sites on the project site (i.e., no California ground squirrels or their burrows, or other suitable burrow surrogates were observed on the project site). However, a small number of California ground squirrel burrows were observed in the spoils materials from the adjacent sand and gravel mining operations. Therefore, there is some potential for offsite individuals to be affected by activities on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Picoides nuttallii	Nuttall's woodpecker (nesting)	none/none/BCC	This species occurs as a resident of low-elevation riparian deciduous and oak habitats (cismontane woodland) throughout much of California with the exception of the deserts, high Sierra Nevada, and redwood belt.	**Known to Occur.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) in the southeastern portion of the project site. Furthermore, the species was heard and observed in the adjacent woodland during reconnaissance-level surveys of the project site. Therefore, the species is known to occur on the project site.
Empidonax traillii	willow flycatcher (nesting)	none/SE/BCC	This species is a rare to locally uncommon, summer resident in wet meadow and montane riparian habitats at 2000 to 8000 feet in elevation in the Sierra Nevada and Cascade Range. It also occurs at scattered locations (at lower elevations) in southern California (including along the Kern, Santa Margarita, San Luis Rey, and Santa Ynez rivers). It most often occurs in broad, open river valleys or extensive mountain meadows with dense shrubby willows. Nesting occurs between mid-May and late August in northern California.	**No Potential.** Though a migrant individual was observed in the mixed oak and riparian woodland on the project site during reconnaissance-level surveys of the site, there is no suitable riparian habitat within or adjacent to the project site that could be used as nesting habitat by this species. Furthermore, there are no records in the CNDDB below 2,000 feet in elevation anywhere in the Sierra Nevada (mostly due to nest parasitism by brown-headed cowbird). Therefore, the species has no potential to occur within the project site or otherwise be affected during nesting by the project.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lanius ludovicianus	loggerhead shrike (nesting)	none/CSC/BCC	This species is found as a resident and wintering species throughout the lower elevation portions of California in grasslands, saltbush scrub, chaparral, oak savannah, and other open woodland types (generally where there are trees with dense cover for nesting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Baeolophus inornatus	Oak titmouse (nesting)	none/none/BCC	This species occurs as a common resident throughout much of California other than the deserts, high Sierra Nevada, and redwood belt. It is generally found in cismontane woodland (particularly oak or riparian woodlands) where it nests in the cavities created by woodpeckers.	**Moderate Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) in the southeastern portion of the project site. Furthermore, there are potential nest sites (i.e., woodpecker-created nest holes) in this woodland. Lastly, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have a moderate potential to occur on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Icteria virens	yellow-breasted chat (nesting)	none/CSC/none	This species is found as a summer resident mostly in low to mid-elevation coastal, valley, foothill, and desert riparian habitats (up to 4,800 feet in foothill riparian and 6,500 feet east of the Sierra Nevada). Nesting typically occurs in dense vegetation near streams.	**Low Potential.** There is suitable nesting habitat for the species (i.e., interrupted riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Chondestes grammacus	lark sparrow (nesting)	none/SA/none	This species occurs as a resident in the lowlands and foothills throughout much of California where it is found in cismontane woodland (especially oaks), open mixed chaparral, and valley and foothill grasslands with scattered trees.	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Spinus lawrencei	Lawrence's goldfinch (nesting)	none/none/BCC	This species is found as a breeding species in oak woodlands, other arid woodlands, and chaparral in the lower elevations of northern California and in riparian woodland, pinyon-juniper woodland, and lower montane communities in southern California. A local water source and a source of abundant seeds are required habitat components.	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
MAMMALS				
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST/none	This taxon is found in the San Joaquin Valley from Contra Costa County south to Kern County. It is also found in the dry interior valleys of the Coast Ranges (e.g., Salinas and Santa Clara valleys). It occurs in open, sparsely vegetated areas of low relief (typically in native or non-native grassland or alkali sink scrub).	**No Potential.** Though there is suitable habitat for the taxon on and adjacent to the project site (i.e., grassland), and it has been recorded 2.7 miles northwest and 4.8 miles southwest of the project site, there are no potential dens on the site that would be suitable for the taxon. The sandy onsite soils may preclude the creation and maintenance of larger burrows that do not collapse (hence the lack of California ground squirrel burrows). Therefore, the taxon is considered to have no potential to

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
				occur within the project site or otherwise be affected by the project.
Taxidea taxus	American badger	none/CSC/none	This species is found as a resident species at scattered localities throughout California (except in the coastal redwood region). Generally occurs in extensive, open habitats in the vicinity of abundant rodent populations.	**No Potential.** Though there is suitable habitat for the species on and adjacent to the project site (i.e., grassland), there are no potential dens on the site that would be suitable for the species. The sandy onsite soils may preclude the creation and maintenance of larger burrows that do not collapse (hence the lack of California ground squirrel burrows). Therefore, the species is considered to have no potential to occur within the project site or otherwise be affected by the project.
Antrozous pallidus	Pallid bat	none/CSC/none	This species is found as a resident in all desert, grassland, shrub, woodland, and forest habitats from sea level to approximately 6,000 feet. Day roosts are typically found in buildings, bridges, rocky outcrops, mines, caves, and trees. Night roosts are generally provided by bridges, mines, and caves.	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the project site. Therefore, it has no potential to occur on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Eumops perotis californicus	Western mastiff bat	none/CSC/none	This subspecies is found as an uncommon resident in southern California, but also occurs along the lower west slope of the Sierra Nevada and in the interior Coast Ranges as far north as the Tumey Hills (eastern San Benito County). Roosts are typically found in crevices in cliff faces, cracks in boulders, or occasionally in buildings (particularly where the roost allows for a large vertical drop).	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the project site. Therefore, it has no potential to occur on the project site.
Lasiurus blossevillii	Western red bat	none/CSC/none	This species occurs at scattered locations throughout the lowland portions of California west of the Sierra Nevada crest and desert regions (typically in riparian forest or orchards). It is less abundant at low and middle elevations in coniferous forest. Roosting sites are found in tree or shrub foliage between 2 and 40 ft above ground (typically in large cottonwoods, sycamores, walnuts, and willows).	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. The large trees associated with this woodland could serve as roost sites – particularly during migration. Therefore, there is some potential, albeit low, for the species to occur on the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site

FEDERAL

FE	Federally listed as Endangered
FT	Federally listed as Threatened
FPE	Federally proposed as Endangered
FPT	Federally proposed as Threatened
FC	Federal Candidate Species (former Category 1 candidates)
BCC	U.S. Fish and Wildlife Service designated “Birds of Conservation Concern” 2008

STATE

SE	State listed as Endangered
ST	State listed as Threatened
SR	State listed as Rare
CFP	California Department of Fish and Game designated “Fully Protected”
CSC	California Department of Fish and Game designated “Species of Special Concern”
SA	California Department of Fish and Game designated “Special Animal”

OTHER

CNPS List 1A	Plants presumed extinct in California
CNPS List 1B	Plants that are rare, threatened, or endangered in California and elsewhere
CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere
CNPS List 3	Plants about which we need more information – a review list
CNPS List 4	Plants of limited distribution – a watch list
CNPS Threat Rank 0.1	Seriously threatened in California (high degree/immediacy of threat)
CNPS Threat Rank 0.2	Fairly threatened in California (moderate degree/immediacy of threat)
CNPS Threat Rank 0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site

LIKELIHOOD OF OCCURRENCE DEFINITIONS

Known to Occur	Taxon was observed within or immediately adjacent to the project site or has previously been documented within or immediately adjacent to the project site.
High Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on more than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.
Moderate Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on less than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.
Low Potential	Taxon has not been documented within or immediately adjacent to the project site nor is it likely to occur on or near the project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
No Potential	Taxon does not occur within or immediately adjacent to the project site due to the lack of required habitat features for the taxon, or the known range of the taxon is well defined and does not include the project vicinity.

Literature Cited

Baldwin, B. and D. Goldman. 2012. The Jepson Manual: Vascular Plants of California, 2nd edition. University of California Press, Berkeley, California. 1568 pp.

Grinnell, J. and A. Miller. 1944. The Distribution of the Birds of California. Published by the Cooper Ornithological Society. Reprinted by Artemisia Press, April 1986. 617 pp.

Ingles, L. 1978. Mammals of the Pacific States: California, Oregon, and Washington. Stanford University Press, Stanford, California. 506 pp.

Jennings, M. and M. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final report submitted to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, Contract No. 8023. 255 pp.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. 342 pp.

Williams, D. 1986. Mammalian Species of Special Concern in California. Wildlife Management Division Administrative Report 86-1. 112 pp.

Zeiner, D. C., W., F. Laudenslayer, Jr., K. E. Mayer, M. White. Editors. 1990. California's Wildlife. Volume 2. Birds. State of California, Department of Fish and Game. Sacramento, California. 731 pp.

Appendix A

Standard Nine-Quadrangle CNDDB/Rarefind 3 Query for the Woodlake 7.5-Minute USGS Quad Centroid

Due to the number of occurrences generated by the CNDDB special-status plant and wildlife queries the condensed full report of occurrences have not been attached to this report, but are available as a pdf upon request to:

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916-812-2540 (cell)

Tulare Irrigation District
McKay Point Reservoir Project Biological Resources Evaluation,
Addendum No. 1
Tulare County, California
January 2021

Introduction

This report summarizes the results of year 2020 reconnaissance-level biological resources surveys, as well as other previous surveys (Bumgardner Biological Consulting 2011, 2013), conducted within and immediately adjacent to the site of the proposed McKay Point Reservoir Project (i.e., Project) in Tulare County, California (Figure 1). The Project site includes Assessor Parcel Numbers (APNs) 113-070-016 (in part), 113-080-005, 113-080-008, 113-090-001, and 113-100-002. The Project site lies 2.5 miles southwest of Lake Kaweah; 1.5 miles southeast of Bravo Lake; 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southwest of the community of Woodlake.

Project Description

The Tulare Irrigation District (TID), Consolidated Peoples Ditch Company (CPDC) and Visalia & Kaweah Water Company (VKWC)) are joint owners (Owners) of the approximately 200 acres of land adjacent to the Kaweah and St. Johns rivers that comprise the Project site. This land is commonly referred to as the McKay Point property.

The Owners propose to construct a new reservoir (i.e., McKay Point Reservoir) on the north side of the divergence of the Kaweah and St. Johns rivers near McKay Point. The McKay Point Reservoir would serve as a surface water storage/re-regulation facility (i.e., surface water management tool). The reservoir would occupy a surface area of approximately 180 acres and would have storage capacity of approximately 4,000 acre-feet. Depths of approximately 60 feet below ground surface (bgs) are proposed. Final slopes would be 3:1, horizontal:vertical (h:v), to minimize any bank erosion from wind and water.

The Project objectives include capturing and re-regulating water made available to the Owners Owners during flood releases from Lake Kaweah; capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah; capturing and re-regulating water released for the Owners during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah); capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners; allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners; allowing other entities to capture and/or re-regulate

flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests; constructing the reservoir in such a way that revenue can be obtained to offset the construction and development costs; and locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

Survey Methods

The Project site, the existing access road located on the adjacent Seaborn site, and other adjacent lands within approximately 250 feet of the sites are all considered part of the Project's biological study area (BSA) and were evaluated during the biological resources surveys in 2011, 2013, and 2020 to identify evidence of special-status plants and wildlife, rare or sensitive vegetation communities, and potential jurisdictional waters or wetlands that could be affected by the Project.

The Project was initially proposed in 2011 but was delayed. The proposed Project has since been reactivated and TID, as the lead CEQA agency, has requested that the biological surveys performed in 2011 and 2013 be updated since they are now several years old. The activities proposed for the Project site have not changed significantly since 2013. However, the sand and gravel removed from the Project site during construction of the reservoir would no longer be taken offsite to the CEMEX processing plant north of the Project site. The excavated aggregate would be processed on the Project site.

There is an existing haul road directly west of the Project site located on the Seaborn site. This road would provide ingress and egress to the Project site. Hence, in addition to updating the biological resources information for the Project site, the existing access road and the areas adjacent to it located on the Seaborn site are also addressed by this report and considered part of the BSA.

The Project site and adjacent lands were surveyed by me (Michael Bumgardner, Bumgardner Biological Consulting) on May 16, 2011 and September 18, 2013. A more recent survey of the Project site (i.e., on October 15, 2020) was again conducted by me. However, the latter survey also included the existing access road on the Seaborn site (as identified above). The surveys of the BSA were conducted on foot as random meander transects, where possible, such that all potentially affected lands could be effectively evaluated. Where random meander transects were not possible, portions of the BSA were surveyed from the nearest private property boundary or through "windshield surveys." Gross-scale mapping of the vegetation communities on the Project site was conducted given that only three discernible vegetation communities occur on the site. The latter

level of mapping of the extant vegetation communities was continued for the access road on the Seaborn site (Figure 2).

An onsite search for evidence of special-status plant and wildlife species was conducted and focused on local taxa that have been recorded in the California Natural Diversity Database (CNDDB) or California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants during the 2011 and 2013 surveys. This data was updated in 2020.

The October 15, 2020 survey of the Project and adjacent areas was conducted mostly as a "windshield survey" to achieve two purposes: (1) to confirm that no substantive changes had occurred to the Project site since the 2013 survey and (2) to identify the extant vegetation communities adjacent to the existing access road on the Seaborn site and evaluate their potential to support special-status plant and wildlife species. However, a more focused survey (i.e., linear transects on 100-foot centers) was conducted by me and Tulare Irrigation District (TID) staff Jeremy Barroll and Riley Nolan (under my direction) on October 15, 2020. The latter survey was focused on finding evidence of burrowing owl, San Joaquin kit fox, and American badger.

Lastly, a reconnaissance-level search for waters with regulatory jurisdiction under the Clean Water Act, California Fish and Game Code, and/or Porter-Cologne Water Quality Control Act was conducted within the Project site boundaries.

Analytical Methods

An updated nine-quadrangle CNDDB/Rarefind 5 report was generated for the Project site (i.e., query of the USGS 7.5-minute topographic quadrangle in which the Project site is found, as well as the immediate eight surrounding topographic quadrangles, viz. Woodlake and the surrounding Stokes Mountain, Ivanhoe, Exeter, Auckland, Rocky Hill, Shadequarter Mountain, Kaweah, and Chickencoop Canyon quads). The CNDDB contains records for special-status species, as well as sensitive natural communities, which have been reported to the California Department of Fish and Wildlife (CDFW). The Rarefind 5 report for the Project site is provided in Appendix A. Each of the species identified in the Rarefind 5 report were then evaluated in terms of their likelihood of occurrence within the BSA. This evaluation considered the known distribution and habitat requirements of the species such that one of the following findings was prepared:

- Known to Occur – species was observed within or immediately adjacent to the Project site during the May 16, 2011, September 18, 2013, or October 15, 2020 survey or has previously been documented within or immediately adjacent to the Project site.

- High Potential – species has not been documented within or immediately adjacent to the Project site but should be expected on more than 50% of visits to suitable habitat in the Project site during the appropriate season and time of day.
- Moderate Potential – species has not been documented within or immediately adjacent to the Project site but should be expected on less than 50% of visits to suitable habitat in the Project site during the appropriate season and time of day.
- Low Potential – species has not been documented within or immediately adjacent to the Project site nor is it likely to occur on the Project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
- No Potential – species does not occur within the Project site due to the lack of required habitat features for the species or the known range of the species is well defined and does not include the Project site.

The findings for each of the species identified in the Rarefind 5 report are presented in this report.

Other sources of information on special-status species in California were subsequently reviewed given that the CNDDB is not inclusive of all special-status species that may occur in an area. This review was based on my professional experience within the region and elsewhere in California, but also included review of other published sources of information on special-status species in California. These latter sources include the following:

- The Jepson Manual: Vascular Plants of California (Baldwin and Goldman 2012).
- California Native Plant Society (CNPS), Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). website http://www.rareplants.cnps.org (Accessed: October 26, 2020).
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994).
- California Herps - A Guide to the Amphibians and Reptiles of California. (Nafis 2020) available at: http://www.californiaherps.com/ (Accessed October 26, 2020).
- California Bird Species of Special Concern. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Game (Shuford and Gardali 2008).
- The Distribution of the Birds of California (Grinnell and Miller 1944).
- California Birds: Their Status and Distribution (Small 1994).

- California's Wildlife Volume II Birds (Zeiner et al. 1990).
- eBird. 2020. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: October 26, 2020).
- Mammalian Species of Special Concern in California (Williams 1986).
- Terrestrial Mammal Species of Special Concern in California (unfinished 1998 update) (Bolster 1998).
- Mammals of the Pacific States: California, Oregon, and Washington (Ingles 1978).
- Western Bat Working Group website (http://wbwg.org/western-bat-species/).
- Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998).

Species that are known or expected to occur in the vicinity of the Project site were then further evaluated in this report.

Vegetation Communities and Site Characteristics

The description of the vegetation communities within the Project site, as described in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), is still valid as the October 15, 2020 survey found no substantive changes in the type or distribution of the onsite vegetation communities have occurred since 2013. Hence, the description and mapping of the vegetation communities described in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013) are herein incorporated by reference.

The areas within the north/northeastern portion of the Seaborn site (adjacent to the existing access road) have been used most recently to support aggregate mining and processing. As such most of the northeastern portion of the property consists of developed land uses and is barren or supports no discernible vegetation communities (Figure 2). Scattered vegetation within this portion of the Seaborn site includes but is not limited to ruderal species such as lamb's-quarters [*Chenopodium album*], deer weed [*Acmispon glaber*], common bindweed [*Convolvulus arvensis*], telegraph weed [*Heterotheca grandiflora*] and various annual grasses.

The existing access road within the Seaborn site runs along the northern boundary of the site. Vegetation along the road consists almost entirely of non-native annual grassland. Though this vegetation community supports some weedy species (e.g., broadleaf filaree

[*Erodium botrys*] and common fiddleneck [*Amsinckia menziesii*]), most of the vegetative cover is composed of non-native annual grasses (e.g., wild oat [*Avena fatua*], rattail fescue [*Vulpia myuros*], bromes [*Bromus* spp.], etc.). This latter stand of vegetation encompasses approximately 41 acres.

All other land cover adjacent to the existing access road (i.e., within 250 feet of the road) is associated with various agricultural uses (orchard, row crops, etc.).

Jurisdictional Wetlands and Other Waters

Jurisdictional wetlands or other waters of the United States are areas that cannot be dredged or filled without a permit from the U.S. Environmental Protection Agency or U.S. Army Corps of Engineers (this latter permit is commonly referred to as a "Section 404" permit in reference to the section of the federal Clean Water Act that requires such permits). Actions that require issuance of a "Section 404" permit include earth-moving activities that result in fill of jurisdictional wetlands and other waters. It should be noted that such actions may also require the issuance of state permits (e.g., California Fish and Game Code Section 1602 lake and streambed alteration agreement and/or Regional Water Quality Control Board Section (RWQCB) Section 401 clean water certification).

Wetlands or other waters of the United States are identified based on three criteria, viz. (1) soil characteristics, (2) hydrology, and (3) plant species. The U.S. Army Corps of Engineers (USACE) has developed a procedure and manual for delineating wetlands that requires comprehensive evaluation of these three criteria during field environmental assessments. A formal wetland delineation was not conducted for the purposes of this report. However, no waters that are clearly subject to the jurisdiction of the USACE, CDFW, or RWQCB, other than the St. Johns and Kaweah Rivers, occur on or immediately adjacent to the Project or Seaborn sites. The only potential exception to this latter finding is that the "daylighted" groundwaters that occur within the Seaborn site may now be jurisdictional based on the Waters of the State regulations that were approved by the Office of Administrative Law and became effective on May 28, 2020. As such, a determination of whether jurisdictional waters occur within the Seaborn site is beyond the reach of this document and will be addressed elsewhere by individuals that are more familiar with the current law and regulations addressing this issue.

Habitat Conservation Plans and Other Similar Habitat Management Plans

There are no Habitat Conservation Plans (HCPs), Natural Community Conservation Plans (NCCPs), or other approved local, regional, or state habitat conservation plans that apply to the Project site.

Special-Status Plant Species

The likelihood of occurrence evaluation for special-status plants provided in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), which did not address the Seaborn site, now addresses both the Project site, the areas adjacent to the existing access road on the Seaborn site, and other areas adjacent to the Project site (i.e., BSA). No special-status plant taxa, as described in Table 1, are associated with the BSA. Nor were any special-status plant taxa observed on or immediately adjacent to the BSA during the October 15, 2020 survey. All special-status plants that occur in the region have been discounted from having any potential to occur within the BSA due to lack of suitable habitat and/or the distribution of the taxon is well known and does not include the BSA.

Special-Status Wildlife Species

The likelihood of occurrence evaluation for special-status wildlife provided in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), which did not address the Seaborn site, now addresses both the Project site, the areas adjacent to the existing access road on the Seaborn site, and other areas adjacent to the Project site . No special-status wildlife species were observed within the BSA during the October 15, 2020 survey. However, 16 special-status wildlife species that have been documented in the Project region (Table 1) are now considered to have some potential to occur in the BSA. Three (3) of these species are insects (i.e., Moestan blister beetle [*Lytta moesta*], Morrison's blister beetle [*Lytta morrisoni*], and Tulare cuckoo wasp [*Chrysis tularensis*]) that are not well known in terms of their life history and behavior, but that have been recorded in the Project vicinity in habitats like those that occur in the BSA. As such, they cannot be discounted and are considered to have some potential, albeit low, to occur in the BSA.

The previous biological resources evaluations for the Project site (Bumgardner Biological Consulting 2013, Entomological Consulting Services 2014) found evidence that a fourth special-status insect taxon (i.e., valley elderberry longhorn beetle [VELB] [*Desmocerus californicus dimorphus*]) occurs within the BSA. However, the U.S. Fish and Wildlife Service's (USFWS) review of records within the southern portion of the subspecies presumed historic range found that records for VELB's "sister subspecies" *Desmocerus californicus* had been inappropriately attributed to VELB. The USFWS subsequently removed Tulare, Kern, and Kings counties from the presumed historic range of the subspecies (USFWS 2014). VELB is therefore no longer considered a special-status species that may be affected by the Project.

Crotch bumble bee [*Bombus crotchii*] is another special-status insect species that is considered to have some potential to occur within the BSA. This finding is based on the species' historic distribution and presence of suitable habitat (e.g., relatively warm and dry sites in open grassland and scrub habitats) within the BSA. Nests of this species are often typically located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. As such, there are many places within the BSA that could be used for nesting by this species. However, given the species rapidly declining range it is not considered to have more than a low potential to occur within the BSA.

Two (2) special-status reptiles (i.e., western pond turtle [*Actinemys marmorata* formerly *Emys marmorata*] and Northern California legless lizard [*Anniella pulchra*]) are believed to have some potential, albeit low, to occur in the BSA. Regarding western pond turtle, it has been known to occur in a wide variety of still or slow-moving waters throughout California. The nearest known occurrences to the BSA are from upstream in the Kaweah River drainage. Thus, the species is considered to have some potential to occur in the aquatic habitats of the adjacent Kaweah and St. Johns rivers Lastly, the species could nest in various upland portions of the BSA.

The potential for California legless lizard to occur in the BSA is believed to be limited to the non-native annual grassland on the Project site, mainly due to the suitable soils (i.e., sands and sandy loam) that are located on the Project site. The nearest known location for the species, Kaweah Oaks Preserve, is less than 8 miles southwest of the Project site and connected via the Kaweah River corridor. Furthermore, the secretive nature of the species often results in failure to document extant occurrences. It may then occur at locations in the Project vicinity where searches for the species have simply not been conducted. As such, it is considered to have at least a low potential to occur within the BSA.

Nine (9) special-status birds are considered to have some potential to occur within the BSA. Five (5) of these latter species (Cooper's hawk [*Accipiter cooperii*], white-tailed kite [*Elanus leucurus*], loggerhead shrike [*Lanius ludovicianus*], oak titmouse [*Baeolophus inornatus*], and Lawrence's goldfinch [*Spinus lawrencei*]) are known to nest in oak or riparian woodlands. Furthermore, each of these species has been recorded nesting within less than 2 miles of the BSA. As such, each of these species, is considered to have either a low or moderate potential to nest or winter (e.g., white-tailed kite) within the BSA.

Other special-status bird species with some potential to occur in the BSA include ferruginous hawk [*Buteo regalis*], merlin [*Falco columbarius*], golden eagle [*Aquila chrysaetos*], and burrowing owl [*Athene cunicularia*].

Three (3) of the latter special-status avian species with some potential to occur within the BSA are strictly wintering species. These species (e.g., ferruginous hawk, merlin, and golden eagle) tend to be wide-ranging, often utilize fallow agricultural fields or similar open vegetation communities (e.g., annual grassland) and have substantial acreage of suitable wintering habitat within the Project vicinity. Winter occurrences of each of these species have been documented within less than 2 miles of the BSA. Therefore, these species can be expected to occur within the BSA on at least an occasional basis.

No evidence of burrowing owl (e.g., urates, regurgitated fur and feather pellets, feathers, prey remains, etc.) has been found in the BSA. In addition, no suitable burrows or burrow surrogates that could be used by the species were found within the BSA. However, California ground squirrel [*Otospermophilus beecheyi*] burrows were observed immediately offsite on the northern and eastern boundaries of the Project site. In addition, scattered California ground squirrel burrows were found in the non-native annual grassland adjacent to the existing access road along the northern boundary of the Seaborn site. However, most of these burrows had been abandoned by the ground squirrels and showed no use by any other large vertebrate species (i.e., most contained substantial cobwebs and plant debris). As such, there is potential for the species to occur adjacent to the existing access road at some point in the future and the species is considered to have at least a low potential to occur in the BSA.

Another special-status taxon that often utilizes California ground squirrel burrows is San Joaquin kit fox [*Vulpes macrotis mutica*]. The burrowing owl surveys found no evidence of this taxon in the BSA. However, this is not unexpected as the taxon does not normally range much north of Kern County on the east side of the San Joaquin Valley (i.e., it occurs principally in the “rain shadow” of the west side of the San Joaquin Valley). The nearest CNDDB occurrence of the taxon is attributed to Woodlake and is 1.5 miles northwest of the BSA. The next five nearest CNDDB occurrences are approximately 4 to 9 miles west of the BSA in the vicinity of Ivanhoe. Therefore, there is some potential for San Joaquin kit fox to occur in the BSA (mostly the western-most portions of the site), but the potential is considered low.

Designated Critical Habitat

When a species is proposed for listing as endangered or threatened under the Endangered Species Act, the USFWS and National Marine Fisheries Service (NMFS) must consider whether there are areas of habitat believed to be essential to the species' conservation. Those areas may be proposed for designation as critical habitat. Only activities that involve a federal permit, license, funding, or authorization (i.e., federal nexus) and are likely to destroy or adversely modify an area of critical habitat can be affected by the designation. In such a case, the USFWS and NMFS typically work with the appropriate federal lead agency, as well as private or other landowners (when appropriate), to amend

their project to allow it to proceed without adversely affecting the critical habitat. Thus, most projects with a federal nexus are likely to go forward, but some may be modified to minimize harm to critical habitat. Regarding the McKay Point Reservoir Project, there is no critical habitat that has been designated that includes the Project or Seaborn sites. Therefore, this issue is not addressed further in this biological resources evaluation.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
		PLANTS		
Atriplex cordulata var. *erecticaulis*	Earlimart orache	none/none/CNPS list 1B.2	This annual saltbush occurs on saline or alkaline soils in valley and foothill grassland. It is known from Kings, Kern, and Tulare counties. It blooms from August to November.	**No Potential.** No individuals of this taxon were observed within the BSA. In addition, the taxon only occurs on saline or alkaline soils in valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the taxon has no potential to occur within the BSA.
Atriplex minuscula	lesser saltscale	none/none/CNPS list 1B.1	This annual saltbush grows in sandy alkaline areas in chenopod scrub, playas, and valley and foothill grassland. It is known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties. It blooms from May to October.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on sandy alkaline soils in chenopod scrub, playas, and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Atriplex persistens	vernal pool smallscale	none/none/CNPS list 1B.2	This annual saltbush occurs in claypan and alkaline vernal pools and alkaline	**No Potential.** No individuals of this species were observed within the BSA. In

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			grasslands. It has been recorded from Colusa, Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties. It blooms from June to October.	addition, the species only occurs in claypan and alkaline vernal pools and alkaline grasslands – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Brodiaea insignis	Kaweah brodiaea	none/SE/CNPS list 1B.2	This perennial bulbiferous herb occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland. It is known only from the Tule and Kaweah river drainages in Tulare County. It blooms from April to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland – within the Tule and Kaweah river drainages. Therefore, the species has no potential to occur within the BSA.
Delphinium recurvatum	recurved larkspur	none/none/CNPS list 1B.2	This perennial herb occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland. It is known from Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, Solano, Sutter, San Luis Obispo, and Tulare counties. It blooms from March to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Diplacus pictus (formerly *Mimulus pictus*)	calico monkeyflower	none/none/CNPS list 1B.2	This annual herb occurs on granitic soils (often in disturbed areas) in broad-leafed upland forest and cismontane woodland. It has been found in Kern and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on granitic soils in broad-leafed upland forest – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Eriogonum nudum var. *murinum*	mouse buckwheat	none/none/CNPS list 1B.2	This perennial herb occurs on sandy soils in chaparral, cismontane woodland, and valley and foothill grassland. It known from only 11 occurrences – all in Tulare County. It blooms from June to November.	**No Potential.** No individuals of this taxon were observed within the BSA. The taxon occurs on sandy soils in valley and foothill grassland – conditions that exist within the BSA. However, all known records are from the Three Rivers area well upstream in the Kaweah River drainage. Therefore, the taxon is considered to have no potential to occur within the BSA.
Eryngium spinosepalum	spiny-sepaled button-celery	none/none/CNPS list 1B.2	This perennial species occurs in and vernal pools, wet valley and foothill grassland, swales, and similar wetland habitats. Known occurrences have been documented in the San Joaquin	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in alkaline areas in wet valley and foothill grassland and vernal pools – conditions that do not

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			Valley (Kern to Stanislaus counties), along the Central Coast (Monterey and San Luis Obispo counties). Blooming occurs from April to May.	exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Euphorbia hooveri (formerly *Chamaesyce hooveri*)	Hoover's spurge	FT/none/CNPS list 1B.2	This annual herb occurs in association with large vernal pools. It has been recorded in Merced, Stanislaus, Butte, Glenn, Tulare, and Tehama counties but may be extirpated in Tulare County. It blooms mostly during July, but sometimes into October if there is sufficient moisture.	**No Potential.** No individuals of this species were observed within the BSA. In addition, suitable habitat (i.e., large vernal pools) does not occur within or near the BSA. Therefore, the species has no potential to occur the BSA.
Fritillaria striata	striped adobe-lily	none/SE/CNPS list 1B.1	This perennial bulbiferous herb occurs in cismontane woodland and valley and foothill grassland (usually on clay soils). It is known from Kern and Tulare counties. It blooms from February to April.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in cismontane woodland and valley and foothill grassland (usually on clay soils) – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Glyceria grandis	American manna grass	none/none/CNPS list 2.3	This perennial rhizomatous grass occurs in bogs and fens, meadows and seeps, and marshes and swamps. It is known from El Dorado, Fresno, Humboldt, Mendocino, Mono, Placer, and Tulare counties. It blooms from June to August.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in bogs and fens, meadows and seeps, and marshes and swamps – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Helianthus winteri	Winter's sunflower	none/none/CNPS list 1B.2	This perennial shrub occurs in open, ungrazed foothill woodlands and annual grasslands on well-drained, granitic soils, generally on lower-elevation, south-facing foothill slopes. It is known from Fresno and Tulare counties where it blooms year-round.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in open, ungrazed foothill woodlands and annual grasslands on well-drained, granitic soils, generally on lower-elevation, south-facing foothill slopes. Therefore, the species has no potential to occur in the BSA.
Lasthenia chrysantha	alkali-sink goldfields	none/none/CNPS list 1B.1	This annual herb occurs in vernal pools and on alkali flats. It has been found in Fresno, Kings, Kern, Lake, Madera, Merced, Placer, Solano, Stanislaus, and Tulare counties. It blooms from February to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in vernal pools and on alkali flats. Therefore, the species has no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	none/none/CNPS list 1B.1	This annual taxon is associated with heavy soils, vernal pools, low alkaline fields and hillsides, and alkaline marshes in Colusa, Kern, Los Angeles, Merced, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, Tehama, Tulare, Ventura, and Yolo counties. It blooms from February to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, suitable habitat for the taxon (alkaline marshes and other wet alkaline habitats) does not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Mimulus norrisii	Kaweah monkeyflower	none/none/CNPS list 1B.3	This annual herb occurs on carbonate or rocky soils in chaparral and cismontane woodland. It has been found in Fresno and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on carbonate or rocky soils in cismontane woodland and chaparral – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Orcuttia inaequalis	San Joaquin Valley orcutt grass	FT/SE/CNPS list 1B.1	This grass occurs in vernal pools (typically larger or more persistent pools) within valley and foothill grassland. The remaining populations	**No Potential.** No individuals of this species were observed within the BSA. In addition, it only occurs in vernal pools in valley and foothill grassland – conditions

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			of this species occur mostly in the southeastern San Joaquin Valley (Fresno, Merced, Madera, and Tulare counties). Historically, the species also occurred in Stanislaus County. It blooms from April to September.	that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Pseudobahia bahiifolia	Hartweg's golden sunburst	FE/SE/CNPS list 1B.1	This species occurs in cismontane woodland and valley and foothill grassland (almost always on shallow, well-drained, fine-textured soils - typically on clay, acidic soils) on the north or northeast facing side of Mima mounds). It has been recorded in Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties. Blooming occurs from March to April.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in cismontane woodland and valley and foothill grassland on the north or northeast facing side of Mima mounds – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Pseudobahia peirsonii	San Joaquin adobe sunburst	FT/SE/CNPS list 1B.1	The species is known from a few mostly small occurrences along the southeastern side of the San Joaquin Valley in the interface with the Sierra Nevada foothills. It occurs on heavy clay soils in valley and foothill	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on heavy adobe clay soils in oak woodland and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			grassland and oak woodland. It has been recorded in Fresno, Tulare, Kern, and Los Angeles counties. Blooming occurs from February to April.	species has no potential to occur in the BSA.
Sagittaria sanfordii	Sanford's arrowhead	none/none/CNPS list 1B.2	This perennial species occurs in shallow, standing, fresh water and slow-moving waterways (e.g., marshes, ponds, vernal pools, lakes, reservoirs, sloughs, ditches, unlined canals, streams, and rivers) at elevations below 2000 feet. It blooms from late May to August.	**No Potential.** No individuals of this species were observed within the BSA. The species occurs in shallow, standing, fresh water and slow-moving waterways (e.g., marshes, ponds, vernal pools, lakes, reservoirs, sloughs, ditches, unlined canals, streams, and rivers). Such habitat (i.e., standing or slow-moving waters does not occur in the BSA. Therefore, the species has no potential to occur in the BSA.
Tuctoria greenei	Greene's tuctoria	FE/SR/CNPS list 1B.1	This grass occurs in the bottom of drying vernal pools in valley and foothill grassland. It is currently known from Butte, Colusa, Glenn, Merced, Modoc, Shasta, and Tehama counties, but has previously occurred in Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties where	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in vernal pools in valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			it is now believed to be extirpated. It blooms from May to September.	
INVERTEBRATES				
Branchinecta lynchi	vernal pool fairy shrimp	FT/none/none	This species occurs primarily in vernal pools (sandstone depression, grass swale, earth slump, or basalt-flow depression pools) in grassland and oak savannah of the Central Valley. However, the species also occurs at a small number of locations in the central Coast Ranges from Monterey County to Santa Barbara County as well as Riverside County.	**No Potential.** There is no suitable vernal habitat within or adjacent to the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.
Lepidurus packardi	vernal pool tadpole shrimp	FE/none/none	This species inhabits clear to turbid vernal pools and swales in the Sacramento Valley and northern San Joaquin Valley.	**No Potential.** There is no suitable vernal habitat within the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Linderiella occidentalis	California fairy shrimp	none/SA/none	Occurs primarily in vernal pools and other seasonal wetlands in grassland and oak savannah of the Central Valley. However, the species has also been recorded at scattered locations in the Coast Ranges from Mendocino County south to Ventura County.	**No Potential.** There is no suitable vernal habitat within the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.
Talanites moodyae	Moody's gnaphosid spider	none/SA/none	Little is known and published about this species. However, it has been found in grasslands under rocks (generally serpentine) on rocky mounts, buttes, and hilltops. Only six known occurrences are reported – all from Fresno and Tulare counties.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on rocky mounts, buttes, or hilltops (usually under serpentine rocks) – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within either of the two sites.
Lytta moesta	Moestan blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in Fresno, Kern, Madera, Santa Cruz, Stanislaus, and Tulare counties. The CDFW reports that little is known about the life history and	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as not occurring within the BSA. Therefore, it is

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			behavior of this species. However, it has been collected from March to September and has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	considered to have some potential, albeit low, to occur on the BSA.
Lytta morrisoni	Morrison's blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as not occurring within the BSA. Therefore, the species has some potential, albeit low, to occur within either of the two sites.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/none/none	This subspecies occurs at scattered locations in the Central Valley and adjacent foothills of the Sierra Nevada and Coast Ranges. It is entirely dependent upon its host plant (i.e., elderberry spp.) and is only found where this shrub occurs (typically in riparian vegetation associations, but occasionally in single, isolated shrubs or stands of the plant). The southern limit of its range in and near the San Joaquin Valley now only extends to Fresno County.	**No Potential.** Many old growth elderryberry shrubs occur within the Project site and observations of valley longhorn beetles and their exit holes at the site were tentatively assigned to the listed subspecies in 2014. However, review by the USFWS has subsequently resulted in the removal of Kings, Kern, and Tulare counties from the subspecies' presumed historic range. Therefore, the subspecies has no potential to occur within the BSA.
Chrysis tularensis	Tulare cuckoo wasp	none/SA/none	This species is known only from a small series of specimens that have been collected in Amador, Fresno, Monterey, and Tulare counties. Cuckoo wasps are nest parasitoids of predatory wasps and sawflies. However, the host species of this species are unknown. Adults have been found from April to June in open,	**Low Potential.** Given that predatory wasps and sawflies (i.e., wasp's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted from occurring within the BSA. Furthermore, the nearest known record to the Project site is from north of Road 212 and Avenue 344 (less than 3 miles from the Project site).

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			sunny habitats with abundant flowers and small shrubs, where they feed on nectar.	Therefore, it is considered to have some potential, albeit low, to occur within the BSA.
Bombus crotchii	Crotch bumble bee	none/SA/none	This species occurs from coastal California east to the Sierra Nevada-Cascade crest. It occurs at relatively warm and dry sites in open grassland and scrub habitats. Colonies are annual and only the new, mated queens overwinter. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees.	**Low Potential.** Given this species' historic distribution and the lack of focused species-specific surveys, it cannot be discounted from occurring on the Project site. Therefore, it is considered to have some potential, albeit low, to occur within the BSA.
AMPHIBIANS				
Ambystoma californiense	California tiger salamander	FT/ST/none	This species is found in annual grassland, oak savannah, and coastal sage scrub adjacent to vernal pools, stock ponds, and ponded reaches of ephemeral streams (aquatic breeding	**No Potential.** No suitable aquatic breeding habitat for the species (i.e., vernal pools or other seasonal wetlands) occurs within the BSA. Furthermore, the nearest known occurrences of the species (at and near the

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			sites). The species is patchily distributed in the Central Valley from Yolo County to Kings County, but also occurs in Alameda and Contra Costa counties south through the interior valleys of the Coast Ranges. Disjunct populations occur in Santa Barbara County and Sonoma County.	Stone Corral Ecological Reserve east of Yettem) are more than 11 miles west of the Project site. Lastly, the BSA is landlocked by agricultural land uses that would preclude the species from reaching the two sites from offsite wetlands that could be used by the species. Therefore, it has no potential to occur within the BSA.
Batrachoseps regius	Kings River slender salamander	none/SA/none	This species has been found in Fresno County on the south and east sides of the North Fork of the Kings River and at Summit Meadow in the drainage of the South Fork of the Kings River. It has also been found in the drainage of the middle fork of the Kaweah River in Tulare County. It occurs in talus, under rocks and downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest above 1,100 and 8,100 feet in elevation.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species has only been recorded in talus, under rocks, under downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest between 1,100 and 8,100 feet in elevation– conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Rana boylii	foothill yellow-legged frog (East/Southern Sierra Clade)	none/SE/none	This species was historically distributed throughout the foothill portions of the Sierra Nevada and Coast Ranges drainages from the Oregon border to the San Gabriel River (Los Angeles County). The species requires shallow, small to moderate streams (typically perennial waters with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs). The East/Southern Sierra Clade extends from the South Fork American River Subbasin to where the Sierra Nevada meet the Tehachapi Mountains.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species requires shallow, small to moderate streams (typically perennial waters) with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Lithobates pipiens	northern leopard frog (native populations only)	none/CSC/none	Historical populations of this species in California existed in scattered locations below 6,500 feet in Siskiyou and Modoc counties and in the northern Owens Valley. Individuals of unknown origin were introduced into El Dorado, Kern, Los Angeles,	**No Potential.** No individuals of this species were observed within the BSA. In addition, the only known population in the region, recorded near Orosi in Tulare County, is an introduced population and is therefore not a special-status species. Hence, there is no available information to

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			Merced, San Francisco, Sierra, Tehama, and Tulare counties between 1905 and 1970. Several of these introduced populations experienced rapid growth and range expansions before completely disappearing. Except for a small population that is currently present in Merced County, all these introduced populations have perished. It has been found in grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, reservoirs (generally where there is permanent water with abundant aquatic vegetation).	suggest that any native populations have the potential to occur within the BSA.
Spea hammondii	western spadefoot	none/CSC/none	This species is found in dry habitats (e.g., annual grassland, oak savannah and woodland, and coastal sage scrub) adjacent to vernal pools, stock ponds, and overflow channels of low-gradient drainages within the Central Valley and coastal California from Monterey	**No Potential.** No suitable aquatic breeding habitat for the species occurs within the BSA. Furthermore, the BSA is relatively landlocked by semi-perennial rivers, sand and gravel mining operations, and agricultural uses that would preclude movement of the species from more suitable habitats located in the Project

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			County to San Diego County.	vicinity (e.g., lands north of Highway 216). Consequently, the species is considered to have no potential to occur within the BSA.
REPTILES				
Actinemys marmorata formerly *Emys marmorata*	western pond turtle	none/CSC/none	This species historically occurred throughout most of the Pacific-slope drainages in California (below approximately 4,000 feet). The species now occurs at scattered locations throughout its former range (primarily in the central Sierra Nevada foothills, Central Valley, San Francisco Bay area, and north-central coast and Coast Ranges. It occurs in and adjacent to ponds, reservoirs, or other slow-moving perennial aquatic habitats (e.g., sloughs, streams, and rivers). The species may be active year-round in some parts of its range.	**Low Potential.** Given that potentially suitable habitat is provided by the adjacent Kaweah and St. Johns rivers and the species has been recorded upstream in the Kaweah River, it cannot be discounted from occurring within BSA. In addition, individuals could also occur in the upland portions of the BSA during egg-laying. Therefore, it is considered to have some potential, albeit low, to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Anniella pulchra	Northern California legless lizard	none/CSC/none	This species occurs as a fossorial species in sand, sandy loam, or leaf-mold substrates. It can be found in a variety of habitats that include coastal beach, chaparral, pine-oak woodland, and riparian habitats. Soil moisture is essential. It appears to be active mostly during the morning and evening, just beneath the surface of sunlight-warmed substrate. It may also be active on the surface at night when substrate temperatures remain warm for extended intervals. It should be noted that recent mitochondrial and nuclear DNA work has resulted in the species being split into five distinct species with the local species (*A. pulchra*) occurring only along the coast, in the Coastal Ranges as far south as northwestern Ventura County and in parts of the San Joaquin Valley.	**Low Potential.** No individuals of this species were observed during the reconnaissance-level surveys of the BSA. However, there is a relatively recent occurrence (2015) documented in the CNDDB from about 0.2 miles northwest of Highway 198 at Road 180, in the vicinity of Outside Creek and Johnson Slough, about 6.5 miles east of Visalia.in the Kaweah Oaks Preserve. Therefore, given the presence of suitable habitat (primarily on the Project site), the species is considered to have some potential, albeit low, to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			BIRDS	
Phalacrocorax auritus	double-crested cormorant (nesting)	none/SA/none	This species is found as a colonial nester on coastal cliffs and offshore islands, and along lake and river margins in the interior portions of California. It nests along the coast on sequestered islets, usually on ground with sloping surface, or in tall trees or snags along lake or river margins.	**No Potential.** A colonial nest site was found in a couple of snags between the southern access road and the mining pit pond on the Seaborn property (outside the BSA). It was not active at the time of the survey given the time of year (October). So, it could not be determined when it was last occupied. However, it is the only colonial nesting site for the species in the area and is outside the BSA. Therefore, the Project would not adversely affect nesting by this species.
Ardea herodias	great blue heron (nesting colony)	none/SA/none	This species is common throughout most of California where there are shallow estuaries, or freshwater or saltwater emergent wetlands. However, it is less common along riverine and rocky coastal shores and above the foothills in the mountains. Rookeries (i.e., nesting colonies) are	**No Potential.** No nesting colonies of this species have been observed within the BSA. In addition, the nearest reported nesting colony is on Dry Creek, one mile north of the confluence of Dry Creek and the Kaweah River (more than two miles from the Project site). Therefore, no known or potential nesting colonies of this species

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			typically active from February to late July and occur in the tops of secluded large snags or live trees. Rookeries are sometime shared with the great egret or other large wading birds.	occur within the BSA.
Gymnogyps californianus	California condor	FE/SE/none	This species occurs as a reintroduced species primarily in the mountains of Ventura, Santa Barbara, Los Angeles, Monterey, and San Benito counties. However, individuals are known to be wide-ranging and occasionally occur soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may be used.	**No Potential.** No suitable roost sites for this species occur within the BSA. In addition, other potential attractors to the sites (e.g., large mammals and potential food sources) are not provided at or near the BSA. Lastly, the nearest known use areas for this species are in more rugged country more than 13 miles southeast of the BSA. Therefore, the species is considered to have no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Accipiter cooperii	Cooper's hawk (nesting)	none/SA/none	This species occurs as an uncommon breeding resident throughout most of the low to mid-elevation wooded portions of California where it inhabits open, interrupted, or marginal woodlands. It is seldom found in areas without dense tree stands. Nest sites are typically found in riparian or deciduous trees in canyon bottoms or river flood plains.	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., interrupted oak woodland with dense stands of trees within the BSA. However, there are only a small number of scattered nesting season records from the Project vicinity in the eBird data base. Nonetheless, this relatively secretive species is considered to have a moderate potential to nest within the BSA.
Buteo swainsoni	Swainson's hawk (nesting)	none/ST/none	Occurs as a breeding resident in the Central Valley (primarily in the southern Sacramento and northern San Joaquin valleys), Klamath Basin, and Modoc Plateau. However, nesting pairs are also occasionally found in the Mojave Desert, Lanfair Valley (San Bernardino County), Antelope Valley (Los Angeles County), and eastern San Luis Obispo County. In the Central Valley the species nests in riparian woodland or forest stands, or oak	**No Potential.** Though suitable nesting habitat for the species occurs within the BSA (i.e., interrupted oak woodland), the nearest known nesting records for the species are more than 17 miles west of these sites in the vicinity of Traver. As such, the species is considered to have no potential to nest within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			savannah. Nest territories are located adjacent to suitable foraging habitat (e.g., grassland, suitable grain and row crop fields, alfalfa, and pastures).	
Buteo regalis	ferruginous hawk (wintering)	none/none/BCC	This species is a winter resident of the Modoc Plateau, Central Valley, and Coast Ranges. It forages in large, open tracts of grasslands, sparse scrubland, and deserts.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Elanus leucurus	white-tailed kite (nesting and wintering)	none/CFP/none	This species is found as a resident throughout the lower elevation portions of California in low rolling grasslands with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. It requires grasslands, meadows, or marshes (for foraging) located near dense-topped	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak woodland) within the BSA. However, there is only one eBird record from the nesting season in the Project vicinity. Nonetheless, there are several eBird records from the Project vicinity during the winter months. Therefore, the species is considered to have

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			trees (for nesting and roosting).	some potential, albeit low, to occur on the BSA (but mostly during the winter months).
Haliaeetus leucocephalus	bald eagle (nesting and wintering)	none/SE/BCC	The species winters throughout California at lakes, reservoirs, rivers, and some rangelands and coastal wetlands. Nesting occurs mainly in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers. Most current nest territories are in northern California, but the species also nests in various locations in the central and southern Sierra Nevada mountains and foothills, in several locations in the central Coast Ranges, inland southern California, and Santa Catalina Island. The nesting season lasts from January through August.	**No Potential.** No individuals of this species were observed during any of the reconnaissance-level surveys of the BSA. There are multiple winter eBird occurrences scattered around nearby Dry Creek and Bravo Lake (sites where public access allows for potential observations - unlike the BSA). However, the species is considered to have no potential to occur within the BSA due to the lack of suitable roost sites or abundant and suitable prey species (e.g., fish or waterfowl).
Aquila chrysaetos	golden eagle (nesting and wintering)	none/CFP/BCC	Found as a breeding resident throughout most of California (other than the valley floor of the Central Valley). Also found as a wintering species throughout most of California	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			(other than the high Sierra Nevada). Species requires open terrain for hunting (e.g., grassland, oak savannah, and early successional stages of shrub and woodland habitats). Typically nests on secluded cliffs, but may also use large, isolated trees.	from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Falco columbarius	merlin (wintering)	none/SA/none	This species winters in California from September to May. It occurs in a variety of low elevation, relative flat habitats that include wooded areas, coastlines, open grasslands, savannah, and the periphery of lakes. It is less often found in open desert. It typically requires dense stands of trees for cover and roosting. It is most often found where there are substantial populations of small birds (the primary prey item).	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Athene cunicularia	burrowing owl (burrow sites)	none/CSC/BCC	This species is found throughout the Central Valley, in the San Francisco Bay Area, at scattered locations along the coast, and in portions of the desert	**Low Potential.** The annual grassland within the BSA provides suitable foraging habitat for the species. In addition, scattered California ground squirrel burrows occur in

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			regions. It is a year-round resident in annual and perennial grasslands or other vegetation communities that support sparse or non-existent tree or shrub canopies.	the far western portion of the BSA. Though no evidence of occupation by burrowing owls was found at these burrows, it does not preclude their future use. Therefore, there is some potential, albeit low, for the species to occur within the far western portion of BSA.
Empidonax traillii	willow flycatcher (nesting)	none/SE/BCC	This species is a rare to locally uncommon, summer resident in wet meadow and montane riparian habitats (typically dense willow scrub) at 2000 to 8000 feet in elevation in the Sierra Nevada and Cascade Range. It also occurs at scattered locations (at lower elevations) in southern California (including along the Kern, Santa Margarita, San Luis Rey, and Santa Ynez rivers). It most often occurs in broad, open river valleys or extensive mountain meadows with dense shrubby willows. Nesting occurs between mid-May and late August in northern California.	**No Potential.** Though a migrant individual was observed in the mixed oak woodland on the Project site during the 2013 reconnaissance-level survey of the site, there is no suitable riparian habitat within the BSA that could be used as nesting habitat by this species (i.e., extensive, dense willow scrub). Furthermore, there are no records in the CNDDB below 2,000 feet in elevation anywhere in the Sierra Nevada (mostly due to nest parasitism by brown-headed cowbird). Therefore, the species has no potential to occur within the BSA as a nesting species.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Lanius ludovicianus	loggerhead shrike (nesting)	none/CSC/BCC	This species is found as a resident and wintering species throughout the lower elevation portions of California in grasslands, saltbush scrub, chaparral, oak savannah, and other open woodland types (generally where there are trees with dense cover for nesting).	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland with dense stands of trees) located in the southeastern portion of the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive). Therefore, the species is considered to have a moderate potential to nest within the BSA.
Vireo bellii pusillus	least Bell's vireo (nesting)	FE/SE/none	Found as a summer resident (late March to late August) in coastal valleys from Monterey County south through coastal southern California to San Diego County. Also occurs at scattered locations along the western border of the deserts. There have been recent records from the Central Valley given its recovery in southern California. It typically nests in dense willow riparian communities but is also	**No Potential.** Though there is no suitable nesting habitat for this subspecies within the BSA, and the subspecies had been extirpated from the Central Valley, it has recently been found sporadically again in the valley (e.g., one nesting record from Merced NWR in 2012). Nonetheless, the subspecies is considered to have no potential to occur within the BSA given the extremely limited number of records in the Central Valley and distance to those recent

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			occasionally found in live oak stands adjacent to drainages.	records.
Baeolophus inornatus	oak titmouse (nesting)	none/none/BCC	This species occurs as a common resident throughout much of California other than the deserts, high Sierra Nevada, and redwood belt. It is generally found in cismontane woodland (particularly oak or riparian woodlands) where it nests in the cavities created by woodpeckers.	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., oak woodland) within the BSA. Furthermore, there are potential nest sites (i.e., woodpecker-created nest holes) in these woodlands. Lastly, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have a moderate potential to occur within the BSA.
Icteria virens	yellow-breasted chat (nesting)	none/CSC/none	This species is found as a summer resident mostly in low to mid-elevation coastal, valley, foothill, and desert riparian habitats (up to 4,800 feet in foothill riparian and 6,500 feet east of the Sierra Nevada). Nesting typically occurs in dense riparian vegetation near streams.	**No Potential.** There is no dense riparian vegetation within the BSA. Though there are records from the Project vicinity in the eBird data base (i.e., multiple records from along Dry Creek Drive in the vicinity of the Kaweah Gravel Pits and a couple of records from the riparian habitat associated with Bravo Lake), the BSA does not provide the

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
				type of dense riparian habitat (e.g., willow scrub) used as nesting habitat by the species in the western United States. Therefore, the species has no potential to occur within the BSA as a nesting species.
Agelaius tricolor	tricolored blackbird (nesting)	none/CSE/BCC	The species is a resident species in annual grassland, oak savannah and freshwater marsh within the Central Valley and coastal California from Sonoma County to San Diego County. Nesting habitat typically involves emergent freshwater marsh, but may include tall, dense stands of willow, blackberry, thistle, nettles, or grasses. Grasslands or rangeland providing an abundant source of food (e.g., large numbers of grasshoppers or butterfly larvae) often are within at least three miles of nest colonies.	**No Potential.** There is a CNDDB occurrence from about 1.3 miles west-northwest of Lake Kaweah Dam, 2 miles north of the Highway 216 and 198 intersection, and 4 miles east of Woodlake. However, there is no suitable nesting habitat (e.g., vegetation that is flooded, spinous, or otherwise defended against easy access by mammalian predators) for the species within the BSA. Therefore, it is considered to have no potential to nest within the BSA.
Spinus lawrencei	Lawrence's goldfinch (nesting)	none/none/BCC	This species is found as a breeding species in oak woodlands, other arid woodlands, and chaparral in the lower	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland) located in the

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			elevations of northern California and in riparian woodland, pinyon-juniper woodland, and lower montane communities in southern California. A local water source and a source of abundant seeds are required habitat components.	southeastern portion of the Project site. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest in the BSA.
MAMMALS				
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST/none	This taxon is found in the San Joaquin Valley from Contra Costa County south to Kern County. It is also found in the dry interior valleys of the Coast Ranges (e.g., Salinas and Santa Clara valleys). It occurs in open, sparsely vegetated areas of low relief (typically in native or non-native grassland or alkali sink scrub).	**Low Potential.** Though there is suitable habitat for the taxon within the BSA (i.e., non-native annual grassland), and it has been recorded 2.7 miles northwest and 4.8 miles southwest of the Project site, surveys of the annual grassland within the BSA found no potential dens or other evidence of the taxon to suggest it occurs within the BSA. In addition, the sandy soils on the Project site may preclude the creation and maintenance of burrows that do not easily collapse (hence the lack of California ground squirrel burrows). Therefore, the

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
				taxon is considered to have only a low potential to occur in the annual grassland associated with the easternmost and northernmost portions of the BSA.
Taxidea taxus	American badger	none/CSC/none	This species is found as a resident species at scattered localities throughout California (except in the coastal redwood region). Generally, occurs in extensive, open habitats in the vicinity of abundant rodent populations.	**No Potential.** Though there is suitable habitat for the species within the BSA (i.e., non-native annual grassland), surveys have found no evidence to suggest that the species occurs within the BSA (i.e., suitable dens or diggings). In addition, the BSA is fragmented from other habitat that could be occupied by the species. Therefore, the species is considered to have no potential to occur within the BSA or otherwise be affected by the Project.
Antrozous pallidus	pallid bat	none/CSC/none	This species is found in a variety of habitats from sea level to approximately 6,000 feet. Day roosts are typically found in buildings, bridges, rocky outcrops, mines, caves, and trees. Night roosts are generally provided by bridges, mines, and caves.	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the BSA. Therefore, it has no potential to occur within the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Eumops perotis californicus	western mastiff bat	none/CSC/none	This subspecies is found as an uncommon resident in southern California, but also occurs along the lower west slope of the Sierra Nevada and in the interior Coast Ranges as far north as the Tumey Hills (eastern San Benito County). Roosts are typically found in crevices in cliff faces, cracks in boulders, or occasionally in buildings (particularly where the roost allows for a large vertical drop).	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the BSA. Therefore, it has no potential to occur within the BSA.
Lasiurus blossevillii	western red bat	none/CSC/none	The species occurs throughout the lowland portions of California west of the Sierra Nevada crest and desert regions (typically in riparian forest or orchards). It is less abundant in coniferous forest. Roosting sites are found in tree or shrub foliage between 2- and 40-feet above ground (typically in large cottonwoods, sycamores, walnuts, and willows).	**No Potential.** Though suitable habitat and roosts for the species occur within the BSA, there are no known occurrences from Tulare County. The nearest records to the BSA (2 records) are from northwestern Fresno County. Therefore, the species is considered to have no potential to occur within the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
FEDERAL				
	FE	Federally listed as Endangered		
	FT	Federally listed as Threatened		
	FPE	Federally proposed as Endangered		
	FPT	Federally proposed as Threatened		
	FC	Federal Candidate Species (former Category 1 candidates)		
	BCC	U.S. Fish and Wildlife Service designated "Birds of Conservation Concern" 2008		
STATE				
	SE	State listed as Endangered		
	ST	State listed as Threatened		
	SR	State listed as Rare		
	CSE	State Designated as Candidate for Listing as Endangered		
	CFP	California Department of Fish and Wildlife designated "Fully Protected"		
	CSC	California Department of Fish and Wildlife designated "Species of Special Concern"		
	SA	California Department of Fish and Wildlife designated "Special Animal"		
OTHER				
	CNPS List 1A	Plants presumed extinct in California		
	CNPS List 1B	Plants that are rare, threatened, or endangered in California and elsewhere		
	CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere		
	CNPS List 3	Plants about which we need more information – a review list		
	CNPS List 4	Plants of limited distribution – a watch list		
	CNPS Threat Rank 0.1	Seriously threatened in California (high degree/immediacy of threat)		
	CNPS Threat Rank 0.2	Fairly threatened in California (moderate degree/immediacy of threat)		
	CNPS Threat Rank 0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)		

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA

LIKELIHOOD OF OCCURRENCE DEFINITIONS

Known to Occur	Taxon was observed within or immediately adjacent to the Project site during the May 16, 2011, September 18, 2013, or October 15, 2020 surveys or has previously been documented within or immediately adjacent to the Project site.
High Potential	Taxon has not been documented within or immediately adjacent to the Project site but should be expected on more than 50% of visits to suitable habitat on and near the Project site during the appropriate season and time of day.
Moderate Potential	Taxon has not been documented within or immediately adjacent to the Project site but should be expected on less than 50% of visits to suitable habitat on and near the Project site during the appropriate season and time of day.
Low Potential	Taxon has not been documented within or immediately adjacent to the Project site nor is it likely to occur on or near the Project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
No Potential	Taxon does not occur within or immediately adjacent to the Project site due to the lack of required habitat features for the taxon, or the known range of the taxon is well defined and does not include the Project vicinity.

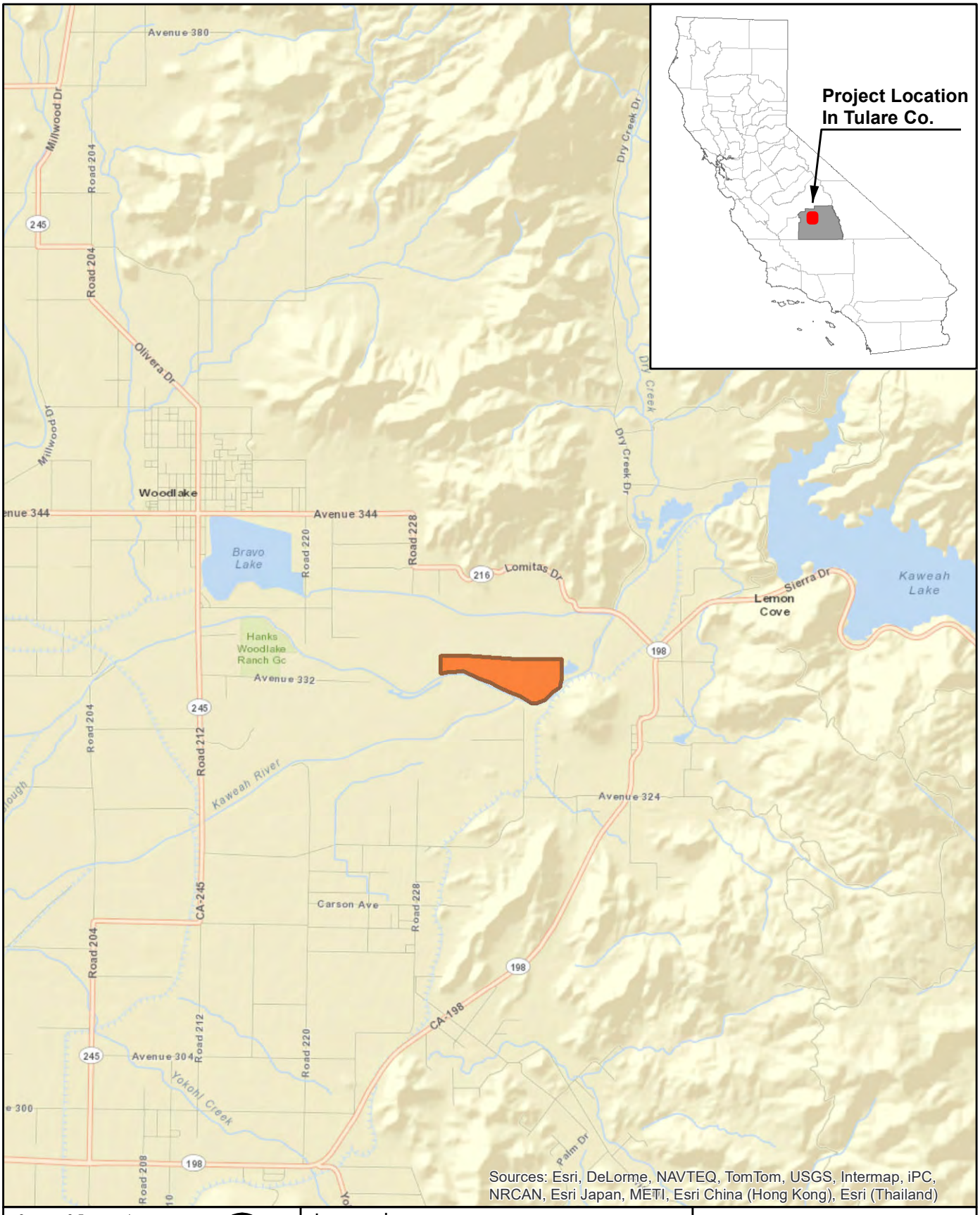
Note: This table has changed from that provided with the *Tulare Irrigation District McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013) given the following: (1) addition of special-status species that were previously undocumented in the query area, (2) addition of new occurrences of special-status species that had previously been document in the query area (3) changes to the state and/or federal regulatory status of species that had previously been documented in the query area., and (4) removal of some species from the CDFW Special Animals List. Hence, this table replaces Table 1 from the 2013 Biological Resources Evaluation.

Literature Cited

Bumgardner Biological Consulting. 2013. Tulare Irrigation District, McKay Point Reservoir Project, Biological Resources Evaluation, Tulare County, California. 37 pp.

Entomological Consulting Services. 2014. Elderberry Inventory Report for the Proposed Reservoir of the Tulare County Irrigation District at McKay Point near Visalia, CA. 12 pp.

U.S. Fish and Wildlife Service (USFWS). 2014. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To Remove the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife, 79 Fed. Reg. 55874 (September 17, 2014)



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An Employee Owned Company

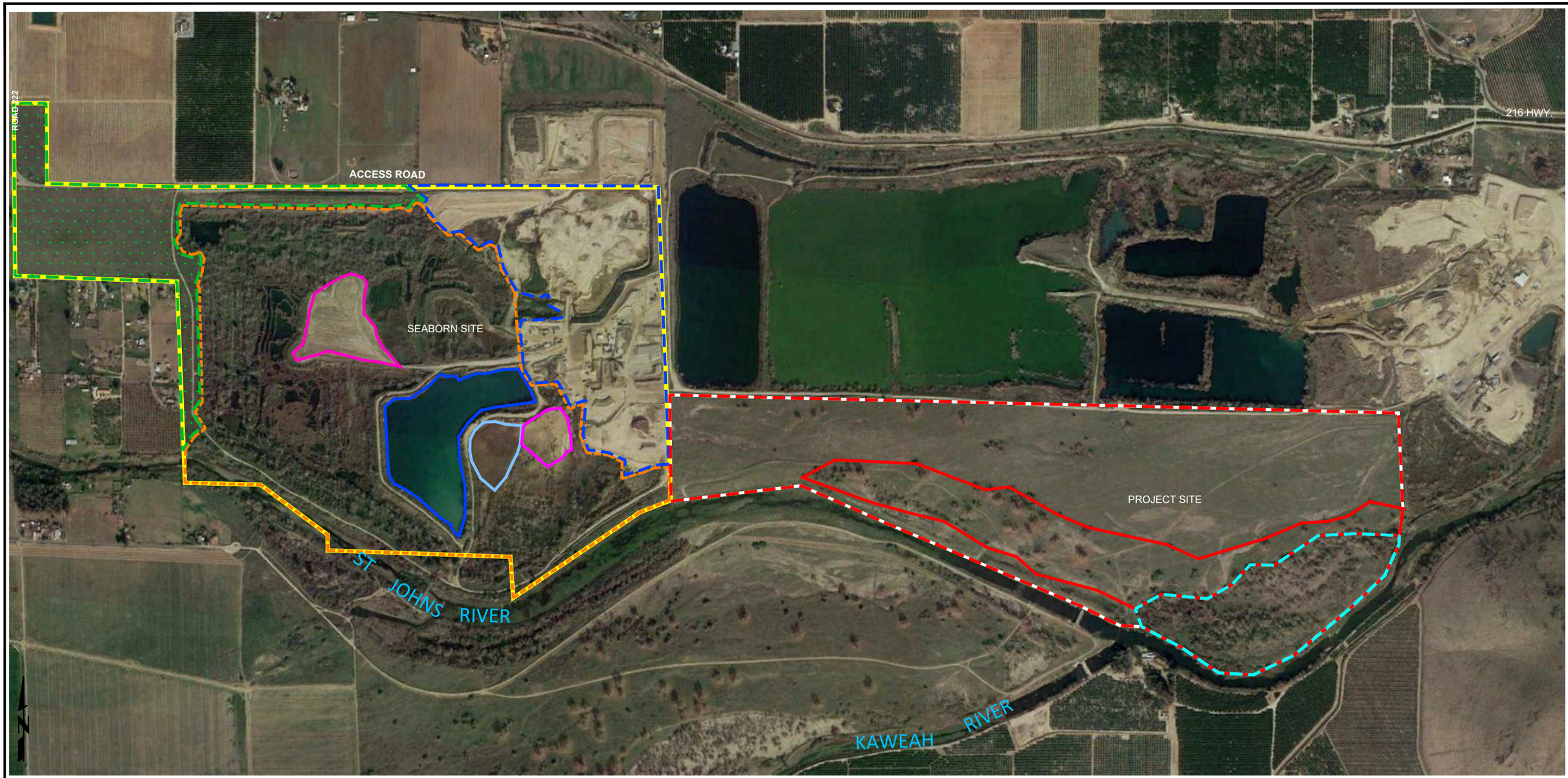
130 N. Garden Street
Visalia, CA 93291
(559) 636-1166

Legend

Project Site

McKay Point Reservoir
Tulare ID
Consolidated Peoples DC
Visalia & Kaweah WC
Figure 1 – Location Map

10/31/2013 : V:\Clients\Tulare ID-1248\124808C1-McKays Point Reservoir\GIS\Map\Revised\Location.mxd



2000 0 2000 4000

SCALE IN FEET

LEGEND

- SEABORN SITE
- ELDERBERRY SAVANNAH RIPARIAN WOODLAND
- MIXED OAK RIPARIAN WOODLAND
- NON NATIVE ANNUAL GRASSLAND
- COTTONWOOD - WILLOW RIPARIAN WOODLAND
- DREDGE POND
- DEVELOPED LAND USE
- CATTAIL MARSH
- RUDERAL
- NON - NATIVE ANNUAL GRASSLAND

DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/05/2018

SESPE CONSULTING, INC.
374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

EXISTING VEGETATION COMMUNITIES ON THE MCKAY PT. RESERVOIR SITE AND ADJACENT SEABORN SITE

SCALE: HORIZ: AS SHOWN
VERT: AS SHOWN
DRAWN BY: G.CAMUS
CHECKED BY: GS
FIGURE NUMBER 2
DATE: OCTOBER 2021

S:\TU01-Tulare Irrigation District\CAD\TU01-Tulare Bio_Figure 1_10-7-21.dwg Oct 12, 2021, 2:18pm GJC

Appendix A

Standard Nine-Quadrangle CNDDB/Rarefind 5 Query for the Woodlake 7.5-Minute USGS Quad Centroid

Due to the number of occurrences generated by the CNDDB special-status plant and wildlife queries the condensed full report of occurrences have not been attached to this report, but are available as a pdf upon request to:

Michael Bumgardner
Bumgardner Biological Consulting

michael.bumgardner@att.net

or

916-638-7368 (office)
916-812-2540 (cell)

APPENDIX E

Legal Descriptions – McKay Point Reservoir Site

TULARE COUNTY ASSESSOR'S PARCEL NUMBERS:

113-070-005	113-080-005
113-070-006	113-090-001
113-070-007	
113-070-008	

DESCRIPTION

THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION FOUR, THE NORTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION FOUR, AND SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION THREE, ALL IN TOWNSHIP EIGHTEEN SOUTH, OF RANGE TWENTY SEVEN EAST, OF THE MOUNT DIABLO BASE AND MERIDIAN.

1. INSTRUMENT : DEED (SEE EXHIBIT "A")
   DATED : APRIL 27, 1882
   GRANTOR : J. W. C. POGUE
   GRANTEE : KAWEAH CANAL AND IRRIGATION COMPANY
   RECORDED : APRIL 27, 1882 IN VOL. 3 OF DEEDS, PAGES 546, 547 & 548, TULARE COUNTY RECORDS
   DESCRIBES : 120 +/- ACRES

2. INSTRUMENT : DEED (SEE EXHIBIT "B")
   DATED : MARCH 03, 1883
   GRANTOR : KAWEAH CANAL AND IRRIGATION COMPANY
   GRANTEE : KAWEAH AND MILL CREEK WATER COMPANY
   RECORDED : MARCH 22, 1883 IN VOL. 6 OF DEEDS, PAGES 158, 159 & 160, TULARE COUNTY RECORDS
   DESCRIBES : AN UNDIVIDED ONE-THIRD INTEREST IN THE PARCELS DESCRIBED IN ITEM 1 ABOVE

3. INSTRUMENT : DEED (SEE EXHIBIT "C")
   DATED : MARCH 07, 1883
   GRANTOR : KAWEAH CANAL AND IRRIGATION COMPANY
   GRANTEE : CONSOLIDATED PEOPLES DITCH COMPANY
   RECORDED : MARCH 17, 1883 IN VOL.6 OF DEEDS, PAGES 123, 124 & 125, TULARE COUNTY RECORDS
   DESCRIBES : AN UNDIVIDED ONE-THIRD INTEREST IN THE PARCELS DESCRIBED IN ITEM 1 ABOVE

4. INSTRUMENT : DEED (SEE EXHIBIT "D")
DATED : APRIL 08, 1892
GRANTOR : KAWEAH CANAL AND IRRIGATION COMPANY
GRANTEE : TULARE IRRIGATION DISTRICT
RECORDED : APRIL 14, 1892 IN VOL.54 OF DEEDS, PAGE 438
: THROUGH PAGE 446, INCLUSIVE, TULARE COUNTY
: RECORDS
DESCRIBES : AN UNDIVIDED ONE-THIRD INTEREST IN THE PARCELS
: DESCRIBED IN ITEM 1 ABOVE (AND OTHER LANDS)

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APPENDIX C

Air Quality, Health Risk, and Climate Change Impact Assessment
(Sespe Consulting, Inc., 2021)

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SESPE CONSULTING, INC.
A Trinity Consultants Company
3990 Old Town Ave. Suite A203 • San Diego, CA 92110 • Office (619) 894-8669 • Fax (805) 667-8104

AIR QUALITY, HEALTH RISK, AND CLIMATE CHANGE IMPACT ASSESSMENT

Tulare Irrigation District
McKay Point Reservoir Project

November 23, 2021

EXECUTIVE SUMMARY

This Air Quality, Health Risk, and Climate Change Impact Assessment (Report) has been prepared to quantify and determine the significance of air quality, health risk, and climate change impacts associated with the proposed excavation, construction, and operation of the McKay Point Reservoir (the Project). The Project location is provided in Figure 1 (Appendix A).

The following Project features would affect air emissions and were assessed.

- Excavation of approximately 110 acres, removal of approximately 16.5 million gross tons of material, and 11.55 net million tons during the excavation phase of the Project. The excavation phase also involves the installation of a slurry wall. For the purposes of this analysis, the excavation is assumed to last 23 years and have a maximum annual excavation rate of approximately 920,000 tons and an annual maximum production rate of approximately 650,000 tons finished product for offsite shipment.
- Construction of inflow and outflow channels, a weir (powered by electricity), and a floating barge pump (powered by a diesel generator).
- Operation of the reservoir, and the associated activities including off-road engine use, vehicle travel, and minor road/landscape maintenance.

Directly adjacent to the Project site there has been an aggregate mining and processing facility that has operated on the Seaborn site since the early 1950s (Figure 2, Appendix A). The emissions data provided by the previous operators was used to calculate the baseline for this Project. Project emissions were estimated by subtracting emissions occurring at the Seaborn site (baseline) from predicted emissions with the Project (future). Baseline emissions were estimated using historical aggregates production records. As a feature of the Project design, the processing rate of the excavated aggregate would be managed such that it would not exceed baseline activity levels.

This analysis uses San Joaquin Valley Unified Air Pollution Control District (SJVAPCD) approved methods in combination with current best practices, including methods from the Health Risk Assessment (HRA) Guidelines (OEHHA, 2015), to quantify the impacts associated with the Project. Methods or guidance provided by the San Diego Air Pollution Control District (SDPACD) and South Coast Air Quality

Management District (SCAQMD) were also used in cases where SJVAPCD guidance was outdated or inapplicable. Use of SDAPCD and SCAQMD guidelines are discussed in the Report Sections 2.4.2 and 3.1.4, respectively. Project emissions are compared to applicable significance thresholds and analyzed with EPA AERMOD and HARP2 HRA modeling software.

The Report has the following findings with respect to Air Quality and Greenhouse Gasses (GHG), which address the specific impact statements within the California Environmental Quality Act (CEQA) Guidelines Appendix G Environmental Checklist Form (California Code of Regulations, Title 14):

1. Air Quality

a) The Project would NOT conflict with or obstruct implementation of any applicable air quality plan. Potential conflicts with applicable air quality plans have been analyzed and ruled out (see Section 2.5.1).

The Project would be required to comply with regional air quality rules promulgated by the SJVAPCD and participate in reducing air pollutant emissions. Aggregate production, which would occur during the Project excavation phase, is proportional to population growth, which is a factor that is accounted for in air quality plans. The Project would not obstruct implementation of applicable SJVAPCD air quality plans and therefore be less than significant.

b) The Project would NOT result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard (see Section 2.5.2).

Table ES-1 presents Project annual emissions for each criteria pollutant and the associated significance criteria established by SJVAPCD. As required by CEQA, the level of significance is determined by the net change (or increment) between pre-project environmental conditions (baseline) and post-project (future) environmental conditions. Because regulatory requirements now require cleaner engines and the use of new technology, the Project source emission values shown in Table ES-1 are at times a negative value. Negative values represent a reduction in emissions from baseline due to cleaner engines or new technologies. This is a beneficial impact resulting from the Project. As shown in Table ES-1, Project emissions do not exceed the SJVAPCD significance criteria and are therefore less than significant.

Table ES-1 Annual Project Emissions and Comparison to APCD Significance Criteria

Criteria Pollutant	Project Permitted Sources (tons/yr)	Permitted Sources Significance Threshold (tons/yr)	Exceeds Permitted Sources Threshold?	Project Permit Exempt Sources (tons/yr)	Permit Exempt Sources Significance Threshold	Exceeds Permit Exempt Threshold?
ROG	-0.08	10	No	-0.35	10	**No**
CO	-0.27	100	No	2.20	100	**No**
NO_X	-0.66	10	No	-5.10	10	**No**

Criteria Pollutant	Project Permitted Sources (tons/yr)	Permitted Sources Significance Threshold (tons/yr)	Exceeds Permitted Sources Threshold?	Project Permit Exempt Sources (tons/yr)	Permit Exempt Sources Significance Threshold	Exceeds Permit Exempt Threshold?
PM_{10} (total)	-0.02	15	No	14.37	15	**No**
$PM_{2.5}$	-0.03	15	No	5.93	15	**No**
SO_X	-0.01	27	No	-0.10	27	**No**

Source: Appendix C.

Note: Negative values result when the Project emissions are less than the baseline emissions and represent emissions reductions due to newer technology and lower emission equipment.

Impact analysis for a project's potential to exceed or contribute to exceedance of an ambient air quality standard (AAQS) normally involves modeling emissions to predict the concentration of pollutant(s) at the property line. However, SJVAPCD has established a screening level of 100 lb/day that is considered overly conservative such that when emissions are below the screening level, it can be assumed that the emissions would not result in a significant impact. SJVAPCD allows emission reduction from the implementation of mitigation measures to be included in the screening analyses. Project emissions with mitigation measures, as necessary, are compared to the 100 lb/day screening level as shown in Table ES-2, and the necessary mitigation measures are discussed below.

Table ES-2 Project On-site Daily Emissions and Model Screening Level Comparison

Criteria Pollutant	CO lbs/day	NO_x lbs/day	PM_{10} lbs/day	$PM_{2.5}$ lbs/day	SO_x lbs/day
Baseline	163	457	260	80	3.2
Excavation	119	221	529	160	0.40
Project	-45	-236	269	80	-2.8
Screening Criteria	100	100	100	100	100
Exceeds Criteria?	**No**	**No**	**Yes**	**No**	**No**

Source: Appendix C.

As shown in Table ES-2, PM_{10} emissions increases associated with the Project may exceed the screening level for PM_{10}. Therefore, the following mitigation measure would be required in order to reduce PM_{10} emissions below the screening thresholds.

Mitigation Measure AQ-1: Unpaved Road Fugitive Dust Control: *Roads upon which material is hauled to the on-site plant for processing shall be controlled by methods that will achieve 90% reduction of fugitive dust. This can be achieved by frequent watering, use of chemical dust suppressants, or a combination of watering and chemical dust suppressants. Other methods which achieve 90% reduction of fugitive dust may be acceptable with Lead Agency approval.*

Mitigated analysis was performed assuming that unpaved roads were controlled at a level of 90% by application of chemical dust suppressants or other equivalent methods. Mitigated results are shown in Table ES-3.

Table ES-3 Mitigated On-site Daily Emissions and Model Screening Level Comparison

Criteria Pollutant	CO (lb/day)	NOx (lb/day)	PM_{10} (lb/day)	$PM_{2.5}$ (lb/day)	SOx (lb/day)
Baseline	163.1	457.1	260.1	79.8	3.2
Excavation	118.5	220.8	344.9	120.7	0.4
Project	-44.6	-236.3	84.8	40.8	-2.8
Screening Criteria	100	100	100	100	100
Exceeds Criteria?	**No**	**No**	**No**	**No**	**No**

Source: Appendix C

c) The Project would not expose sensitive receptors to substantial pollutant concentrations (see Section 2.5.3).

Table ES-4 presents health risk assessment results for the Project and compares them to applicable thresholds.

Health risk is determined based on the change in conditions associated with the implementation of the Project. Emissions sources present in the baseline cease to operate, and emissions from the Project are introduced. Therefore, baseline risk is modeled as negative risk (emissions going away), and Project risk is modeled as positive (new emissions). In many cases, Project emissions end up being lower than those in the baseline, due to newer technologies and updated regulations. In such cases, risk to receptors may be reduced, as the Project results in a reduction of emissions. In cases where risk to a receptor is greater in the baseline than in the Project, the risk is represented as a negative number.

Table ES-4 Project Health Risk Impacts and Comparison to Significance Thresholds

Receptor Figure Label – Type	Receptor Model ID #	Excess Cancer Cases per Million People Exposed	Chronic Hazard Index	Acute Hazard Index
1 – Residence	396	-22.1	0.0	0.000
2 – Residence	397	-16.4	0.0	0.020
3 – Residence	398	4.4	0.23	0.031
4 – Residence	399	3.9	0.14	0.059
5 – Residential	400	1.9	0.08	0.065
6 – Residential	401	-0.2	0.03	0.094
7 – Residential	402	1.9	0.09	0.075
8 – Elementary School	403	-0.4	0.04	0.059
9 – Residential	404	-3.1	0.03	0.099
10 – Residential MEIR (TID Owned)	405	18.4	0.59	0.33

Receptor Figure Label – Type	Receptor Model ID #	Excess Cancer Cases per Million People Exposed	Chronic Hazard Index	Acute Hazard Index
11 – Residential	406	-55.2	0	0.000
12 – Residential	407	-52.4	0	0.000
13 - Residential	408	-1.8	0.001	0.035
14 – Worker, Cemex Facility MEIWR	409	0.76	0.07	0.25
15 – PMI	519	N/A	N/A	0.46
Significance Threshold	**N/A**	**20**	**1.0**	**1.0**
Threshold Exceeded?	**N/A**	**No**	**No**	**No**

Source: Appendix E.

Note: These receptors represent locations of highest exposure. Discrepancies between table and appendix values may exist due to rounding. Negative values represent risk levels that when compared to baseline levels are less than the baseline level – resulting in a beneficial impact.
MEIR: Maximum Exposed Individual Receptor; MEIW: Maximum Exposed Individual Worker; PMI: Point of Maximum Impact

As demonstrated in Table ES-4, the Project does not result in exceedances of the significance thresholds and therefore the Project impacts would be less than significant.

d) The Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people (see Section 2.5.4).

Baseline conditions include similar sources to the Project sources that could cause odor. Based on SJVAPCD records, the previous operations did not receive complaints about odor in the past from a substantial number of people. The Project would have similar or upgraded emission controls compared to the Seaborn facility, and in general the Project is further away from receptors than the Seaborn facility. SJVACPD provides a screening table of facilities that are considered sources of significant odors. As seen in the Table 34, aggregate mining and processing facilities are not included in SJVAPCD for potential significant odor generating sources. In addition, SJVAPCD has regulations that require facilities not to present a nuisance to the adjacent areas. Odor complaints are addressed under the SJVAPCD nuisance rule (Rule 4102). The Project would comply with SJVAPCD rules and regulations. Therefore, Project impact related to odor is less than significant.

2. Greenhouse Gasses (GHGs)

a) The Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment (see Section 3.5.1).

"It is widely recognized that no single project could generate enough GHG emissions to noticeably change the global climate temperature. However, the combination of GHG emissions from past, present, and future projects could contribute substantially to global climate change. GHG emissions, and their associated contribution to climate change, are inherently a cumulative impact issue. Therefore, project-level impacts of GHG emissions are treated as one-in-the-same as cumulative impacts." (SJVAPCD, 2015, p. 111). As recognized by SJVAPCD in the preceding quote, climate change is a cumulative effect and no single project is large enough to impact climate change. Thus, the Project would not, by itself, either directly or indirectly result in a significant impact on the environment due to generation of GHG emissions.

This concept is also reflected in California Air Resources Board's (CARB's) 2017 Scoping Plan, which regulates fuels at a level in the supply chain above the Project, such that the Project has no choice but to use energy in California that is already regulated. The Project therefore does not have its own emissions, but is simply a location in which GHG emissions are taking place as a result of fuel that is already regulated. Therefore, the Project itself cannot have a significant impact on the environment.

b) The Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. Potential conflicts with applicable air quality plans have been analyzed and ruled out (see section 3.5.2).

Project emissions of GHGs are presented in Table ES-5 below, primarily for purposes of disclosure. SJVAPCD guidance on impact analysis and threshold determination for GHGs is outdated and the methods used in SCAQMD which are more recent were used to evaluate significance of Project GHG emissions. Specifically, SCAQMD excludes emissions from sectors that are required to participate in the Cap-and-Trade Program administered by the California Air Resources Board (CARB) as discussed in the *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Project* (SCAQMD, 12/12/2014).[1] The Project would emit GHGs from fuel burned in engines. Transportation fuel suppliers and importers are required to report emissions under the Cap-and-Trade which is designed to reduce GHG emissions as needed to achieve emissions reductions described in related planning documents which primarily consists of the Assembly Bill (AB) 32 Scoping Plan. Thus, the emissions reductions will occur at a level in the supply chain above the Project which will have no choice but to use fuels with GHG intensities that are consistent with the current Scoping Plan.

[1] http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2014

Table ES-5 Project GHG Emissions

Source	CO_2e (MT/yr)
Baseline Emissions	1,280
Future Emissions (Max Year)	2,283
Total Project Emissions	1,003
Screening Criteria (SCAQMD)	10,000
Project Exceeds Screening Criteria?	**No**

Source: Appendix C.

Note: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds.

In summary, GHG emissions from the Project are less than the SCAQMD GHG screening criteria. In addition, each Project source would emit GHGs in amounts consistent with the AB 32 Scoping Plan. Therefore, the Project impact related to GHG emissions is less than significant.

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Air Quality and Climate Change Impact Assessment

Tulare Irrigation District
McKay Point Reservoir Project

November 23, 2021

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1.0 INTRODUCTION

This Air Quality and Climate Change Impact Assessment (AQCCIA) presents technical information and analysis describing reasonably foreseeable changes to the environment that would occur with the McKay Point Reservoir Project (Project) located near Lemon Cove, California (Figure 1, Appendix A).

The Project is within a mining resource zone of regional significance (CGS, 2018). Accordingly, there are aggregate mining operations in the immediate vicinity of the Project site. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility was located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 miles to the southwest of the Project site. See Figure 2 (Appendix A) which shows the regional Project site setting.

The potential air quality impacts are analyzed for the following three phases: excavation of the site for the reservoir (the excavation phase); construction of the reservoir (the construction phase); and, operation of the reservoir (the operation phase).

The Excavation Phase

The excavation phase would involve excavating approximately 110 acres in order to provide a pit of sufficient size to allow the reservoir to be constructed. The excavation is anticipated to occur up to approximately a 23-year period and approximately 16.5 million gross tons of raw material would be excavated. The raw aggregate material would be excavated and processed onsite by West Coast Aggregate (WCA). Processing of the raw material would include a wash/screen plant and a crush/recycle plant. The production of Portland Cement Concrete (PCC) grade aggregate would produce approximately a total 11.55 million net tons of PCC grade aggregate.

Sand and gravel (aggregate) mining and processing activities have been conducted at the adjacent Seaborn site since the late 1940's. During the ten-year period of 1997 to 2006, the average net tonnage produced on the Seaborn site was 535,903 tons. The peak year during that period was 2005, with 650,673 tons produced on the Seaborn site. Based on this historic data, 500,000 tons annually was chosen as a conservative representation of the average year in the baseline, and 650,000 tons annually was chosen to represent the maximum year in the baseline.

The excavation, storage and production of PCC grade aggregate would be managed by WCA such that the baseline maximum production rate of the processed aggregate by WCA would not exceed the baseline production rates previously being done at the mining operation located on the Seaborn site. Once processed, approximately 70 percent of the excavated materials would be of marketable quality, which is referred to as net tons. This means a year's excavation of 920,000 gross tons would produce approximately 650,000 net tons of processed marketable construction-grade aggregate. Therefore, the number of on-road trucks transporting the material offsite on public roads to WCA's customers would not result in an increase to the baseline number of trucks used at the Seaborn site.

The crush/recycle plant (powered by a diesel generator) would be used to break up oversized pieces of rock prior to processing in the wash/screen plant. The crush/recycle plant would also be used to recycle used concrete and asphalt brought in from offsite. WCA would also import materials to be blended with the aggregate if required by their customers. For the purposes of this analysis, it was assumed that when recycling and/or blending activities were taking place, the excavation and processing of aggregated would be reduced such that the total emissions associated with excavation/processing of aggregate combined with the emissions associated with the transport and processing/blending of recycled materials and additives would not result in an increase to baseline. The Project would be managed such that this would be the case.

A slurry wall, needed to minimize groundwater seepage into the pit, would also be installed around the perimeter of the site during the early stage of the excavation phase to allow for dry mining techniques during excavation. The slurry wall would remain after excavation and become part of the reservoir.

The Construction Phase

The reservoir construction phase would include installation of following:

- Inflow and outflow channels;
- Electrically operated weir;
- Floating barge pump (diesel);
- Energy dissipation pools;
- 10,000-gallon diesel fuel storage tank with secondary containment; and
- Two diesel-fired generators.

Due to the low volatility of diesel, the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD) does not consider diesel tank emissions to be sufficiently consequential to require permitting; therefore, diesel storage tank emissions were not considered in this analysis (see Section 2.1.3.2).

The Operation Phase

The reservoir operation phase would involve the proposed basin being filled an average of two times per year for a total usable yearly volume of 9,100 acres-feet. Approximately 3,580 acres-feet would flow by gravity into the adjacent St. Johns River and the remaining 5,520 acres-feet could be pumped out at a maximum flow rate of 160 cubic feet per second (cfs). Operation phase emissions would result from the two diesel generators used by the pump, a backhoe used for site maintenance, and onsite trucks used for water spray, refueling of the diesel generator, other minor site or equipment maintenance.

2.0 AIR QUALITY

This AQCCIA was prepared using current best practices including the Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD, 2015) and the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA, 2015). Methods or guidance provided by the San Diego Air Pollution Control District (SDPACD) and South Coast Air Quality Management District (SCAQMD) were also used in cases where SJVAPCD guidance was outdated or inapplicable. Use of SDAPCD and SCAQMD guidelines are discussed in Sections 2.4.2 and 3.1.4 respectively.

2.1 Regulatory Setting

Both the state and the federal government have established health-based criteria called Ambient Air Quality Standards (AAQS) for six air pollutants. These "criteria pollutants" are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter ($PM_{2.5}$ and PM_{10}), each of which is described more fully In Appendix B (Characteristics of Air Pollutants). The regulatory status of the criteria pollutants within the SJVAPCD and AAQS which are presented in Table 1. Many constituents in air emissions other than criteria pollutants result in health effects and are regulated as toxic air contaminants (TACs) using health risk assessment methods (i.e., as opposed to comparing concentration of criteria pollutant to an AAQS). Diesel particulate matter (DPM) and respirable crystalline silica (RCS) are two TACs of concern associated with Project sources and are also discussed in Appendix B.

2.1.1 Federal

2.1.1.1 Criteria Pollutants

The Clean Air Act (CAA) is the comprehensive Federal law that regulates air emissions from stationary and mobile sources. Congress established much of the basic structure of the CAA in 1970, and made major revisions in 1977 and 1990. "The Clean Air Act in a Nutshell: How It Works" (EPA, 2013) contains a thorough yet concise summary of how US EPA implements the CAA. Table 1 presents Federal and State AAQS. Table 2 identifies how the CAA applies to The Project.

Table 1 State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3) [8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM_{10}) [9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$) [9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)	—	

Pollutant	Averaging Time	California Standards[1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemi-luminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemi-luminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectro-photometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1,300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[10]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: CARB, May 4, 2016.

Up to date as of December 9, 2020. See footnotes on following page.

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µ g/m3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the US EPA for further clarification and current National policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method, which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard, may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
6. Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the US EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the US EPA.
8. On October 1, 2015, the National 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the National annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing National 24- hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour National standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the National 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the National 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the National standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour National standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 National standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour National standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour National standard to the California standard the units can be converted to ppm. In this case, the National standard of 75 ppb is identical to 0.075 ppm.
12. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The National standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Table 2 Applicability of US EPA Activities under the CAA to the Project

US EPA Activity	Applicable to Project Sources?
Establish air quality standards.	Yes, see **Impact AQ-2**.
Designate quality of air in attainment areas.	No, the Project is not an attainment area.
Administrate state implementation plans.	No, the Project is not a SIP.
Require additional programs in nonattainment areas.	Yes, the Project would comply with SJVAPCD programs and rules that address nonattainment.
Provide guidance on control techniques.	No, the Project would employ standard controls.
Regulate interstate air pollution.	No, the Project is not a state.
Require plans to maintain clean air after a nonattainment area meets the standard.	Yes, the Project would comply with SJVAPCD programs and rules that maintain attainment.
Preserve clean air in attainment areas.	Yes, the Project would comply with SJVAPCD programs and rules that preserve attainment.
Adopt National standards for new stationary sources.	Yes, new stationary sources at the Project that have an applicable New Source Performance Standard (NSPS) are discussed in this subchapter.

US EPA Activity	Applicable to Project Sources?
Adopt National standards or guidelines for consumer and commercial products.	No, the Project does not buy products that emit air pollutant from vendors outside the country.
Adopt National standards for new vehicles and engines, and fuels.	No, the Project does not manufacture vehicles, engines, or fuels.
Regulate emissions from oil drilling on the Outer Continental Shelf.	No, the Project is not drilling oil or located on the Outer Continental Shelf.
Regulate hazardous air pollutants.	Yes, the Project is subject to the NESHAP for engines as discussed in this subchapter.
Protect visibility in National parks by regulating regional haze.	No, the Project is approximately 10 miles from the boundary of Sequoia National Park but does not include a major stationary source.
Control acid rain by regulating NO_2 and SO_2 emissions from power plants.	No, the Project does not include a power plant or other major source of combustion pollutants.
Protect stratospheric ozone by regulating ozone-depleting compounds (e.g., chlorofluorocarbons).	No, the Project would purchase refrigerants and other classes of products from a U.S. vendor.
Regulate major sources of air pollution by administrating a Federal operating permit program.	No, the Project is a minor source that does not require a Federal operating permit.

New Source Performance Standards – Title 40, Code of Federal Regulations (CFR), Part 60

Subpart OOO (Nonmetallic Mineral Processing Plants) is applicable to new, modified, or reconstructed nonmetallic mineral processing facilities (with certain exceptions, such as fixed sand and gravel plants and crushed stone plants with capacities of 25 tons per hour or less, or portable sand and gravel plants and crushed stone plants with capacities of 150 tons per hour or less). Subpart OOO restricts emissions from affected facilities equipped with capture systems used to capture and transport particulate matter to a control device. Emissions are prohibited in excess of 0.032 grams per dry standard cubic meter (g/dscm) (0.014 grains per dry standard cubic feet [gr/dscf]), and from exhibiting visible emissions based on quarterly monitoring. Subpart OOO also prohibits the discharge of any fugitive emissions from affected facilities without capture systems and the discharge of fugitive emissions escaping capture systems that exhibit greater than 7 percent opacity (12 percent for crushers without capture systems).

Subpart IIII (Stationary Compression Ignition Internal Combustion Engines) is applicable to new, modified, or reconstructed stationary engines and would apply to the generators. However, the requirements would be superseded by application of the best available control technology (BACT) which will be more stringent, and particularly near 2030 when the generators are expected to be installed.

Regulations Affecting New Diesel Engines

US EPA regulates emissions from new non-road (i.e., off-road, portable, and stationary) internal combustion engines by tiered standards (e.g., compression-ignition engines in 40 CFR 89.112, 40 CFR 1039.101, and 40 CFR 1039.102). Emissions from new non-road engines are regulated using standards that apply by model year, class of vehicle, and fuel type (e.g., heavy-heavy duty diesel engines in 40 CFR 86.004-11, 40 CFR 86.007-11, and 40 CFR 86.099-11). These regulations affect manufacturers but are relevant to the Project because diesel engines are the primary source of Project emissions besides dust.

Engine tiers are emissions standards that were phased-in by size and model year between 1996 and 2015. Tier 0 engines are engines that were built before the applicable engine tier standard came into effect for each engine size. Although the regulations require Tier 4 Final engines in 2015, manufacturing has not kept up with demand in the 100 to 174 hp and 750+ hp size categories. Table 3 presents the emissions factors for each tier.

Table 3 Engine Tier Emissions Standards

Engine Tier	NOx + NMHC (g/hp-hr)	NMHC (g/hp-hr)	Nox (g/hp-hr)	CO (g/hp-hr)	PM (g/hp-hr)
1	Ns	1.0	6.9	8.5	0.40
2	4.9	Ns	Ns	2.6	0.15
3	3.0	Ns	Ns	2.6	0.15
4 Interim	3.0	Ns	Ns	2.6	0.015
4 Final	Ns	0.19	0.3	2.6	0.015

Notes: ns = no standard; and 1.341 hp/kW is used to convert kW in the regulation to hp in this table.

Regulations Affecting Sources of Hazardous Air Pollutants

The Federal Clean Air Act Amendments (CAAA) Section 112(k) requires the EPA to reduce hazardous air pollutant (HAP) risks in urban areas. The EPA's strategy for reducing these risks is discussed in the *Integrated Urban Air Toxics Strategy*. Among the major new programs are the operating permits program (Title V) and provisions to phase out ozone-depleting substances (Title VI). Existing programs that have seen major changes due to the amendments include attainment provisions for the National Emissions Standards for Hazardous Air Pollutants (NESHAP) program.

The provisions in Title I that address the control of HAP emissions, or air toxics, include provisions for the promulgation of NESHAP, or maximum achievable control technology (MACT) standards, as well as several related programs to enhance and support the NESHAP Program. The activities and responsibilities required under Section 112 directly affect not only the EPA but State and local regulatory agencies as well. In addition to air quality agencies administering the majority of Section 112, the storage of acutely hazardous materials above threshold quantities is administrated under Section 112® by the State Office of Emergency Management (OEM) through the local Certified Unified Permitting Agencies (CUPAs).

The Project's generators to be installed would be subject to the Reciprocating Internal Combustion Engine (RICE) NESHAP (40 CFR 63, Subpart ZZZZ). The engines would need to meet BACT when installed. Such engines would require monitoring and recordkeeping under this NESHAP.

2.1.2 State

The California Air Resources Board (CARB) coordinates and oversees both state and federal air pollution control programs in California. CARB oversees activities of local air districts and is responsible for incorporating air quality management plans developed by each air district into the State Implementation Plan (SIP) for Federal EPA approval. CARB maintains air quality monitoring stations throughout the State in conjunction with local air districts. Data collected at these stations are used by CARB and EPA to classify areas as "attainment" or "nonattainment" with respect to each pollutant and to monitor progress towards attaining air quality standards. ARB has divided the State into 15 air basins. Significant authority for air quality control is delegated to local air districts that regulate emissions from stationary sources and develop attainment plans.

2.1.2.1 Criteria Pollutants

The State of California began to set California ambient air quality standards (CAAQS) in 1969. The CAAQS are generally more stringent than the NAAQS. In addition to the six criteria pollutants covered by the NAAQS, there are CAAQS standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. These standards are also listed in Table 1.

Originally, there were no deadlines for the air districts to meet the CAAQS, or to be in "attainment" with the CAAQS. However, the California Clean Air Act (CCAA) provided a timeframe and a planning structure to promote their attainment levels. The CCAA required air districts that did not have air quality in their air basins that met the standards (nonattainment areas) in the State to prepare attainment plans and proposed to classify each such area on the basis of the submitted plan. The attainment plans require a minimum 5 percent annual reduction in the emissions of nonattainment pollutants unless all feasible measures have been implemented. The Tulare County area of the San Joaquin Valley Air Basin (SJVAB) is currently classified as a nonattainment area for three criteria pollutants: O_3, PM_{10}, and $PM_{2.5}$.

2.1.2.2 Toxic Air Contaminants

The CARB Statewide comprehensive air toxics program was established in the early 1980s. The Toxic Air Contaminant Identification and Control Act (AB 1807, 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987) requires a Statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Under AB 1807, CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community." AB 1807 also requires CARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds. The list of Toxic Air Contaminants (TACs) includes all federal HAPs plus the following pollutants: 1,2-dibromoethane, 1,2-dichloroethane, hexavalent chromium, cadmium, inorganic arsenic, nickel, inorganic lead, diesel particulate matter, and environmental tobacco smoke (17 CCR § 93000 and §93001).

Under AB 2588, facilities are required to report air toxic emissions, ascertain health risks and notify nearby residents of significant risks. In September 1992, the Hot Spots Act was amended by Senate Bill 1731, which required facilities that pose a significant health risk to reduce their risk through a risk management plan. The emissions inventory and risk assessment information from this program is incorporated into this AQCCIA as discussed in Section 3.4.

In July 2007, CARB adopted an airborne toxic control measure (ATCM) for in-use off-road diesel vehicles (13 CCR § 2449 et seq.). This regulation required that specific fleet average requirements be met for NO_x emissions and for particulate matter emissions. Where average requirements cannot be met, BACT requirements apply. The regulation also included several recordkeeping and reporting requirements.

After a series of revisions and amendments, the Final Regulation Order, effective November 30, 2018, establishes a tier-based phase out schedule that is outlined in Table 4 for small fleets (cumulative horsepower of up to 750) and large fleets (cumulative horsepower of greater than 750).

Table 4 Portable Engine ATCM Phase-Out Schedule

Engine Certification	Engines Rated 50 to 750 bhp		Engines Rated >750 bhp
	Large Fleet	Small Fleet	
Tier 1	1/1/2020	1/1/2020	1/1/2022
Tier 2 built prior to 1/1/2009	1/1/2022	1/1/2023	1/1/2025
Tier 2 built on or after 1/1/2009	NA	NA	1/1/2027
Tier 3 built prior to 1/1/2009	1/1/2025	1/1/2027	NA
Tier 3 built on or after 1/1/2009	1/1/2027	1/1/2029	NA
Tier 1, 2, and 3 flexibility engines	December 31 of the year 17 years after the date of manufacture. This provision shall not apply to any engine operation before the effective date of this regulation.		

Source: (CARB, 2018).

The CARB ATCM for Stationary Compression Ignition Engines (17CCR § 93115 et. seq.) contains tables of emissions standards that vary based on the size, use, and existence of the engine. Specifically, new engines have to meet emissions standards for all pollutants while existing engines comply by reducing emissions of DPM by 85% or more. Engines used in agricultural operations have separate requirements as well.

Because the Project is located on an alluvial deposit, and naturally occurring asbestos (NOA) is not found in alluvium, the following ATCM for construction, grading, quarrying and surface mining operations applies to the Project:

- Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations (17 CCR § 93105) requires the implementation of mitigation measures to minimize emissions of asbestos-laden dust unless an exemption in the ATCM applies. Applicable to this Project, the ATCM states that the "APCO may provide an exemption for crushing, screening and conveying equipment, stockpiles, and off-site material transport at a sand and gravel operation if the operation processes only materials from an alluvial deposit."

On July 26, 2017, Governor Brown approved Assembly Bill No. 617 ("AB 617"). AB 617 added and amended various sections of the California Health and Safety Code. The intent of AB 617 is to develop a collaborative relationship between CARB and local air districts to facilitate community participation, provide a science-based foundation supporting the identification of communities with high cumulative exposure burdens, accelerate the development and use of advanced air monitoring methods and equipment, and support the use of new mobile and stationary source technology. Specific communities have been identified as priority disadvantage communities that are currently subject to AB 617 requirements. The Project is not located in an identified community at this point. If in the future it is identified as being in a disadvantaged community subject to AB 617, the Project would comply with the requirements set forth in AB 617, as applicable.

2.1.3 San Joaquin Valley Unified Air Pollution Control District

The 1976 Lewis Air Quality Management Act established the San Joaquin Valley Unified Air Pollution Control District (SJVAPCD or District) and other air districts throughout the state. The Federal Clean Air Act Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

The CCAA provides the SJVAPCD with the authority to manage transportation activities and regulate stationary source emissions. Indirect sources of pollution are those sources related to a stationary facility or development project (see Rule 9510) but otherwise outside the Air District authority to regulate. An example of this would be the motor vehicles at an intersection, a mall, and on highways. As a State agency, CARB regulates motor vehicles and fuels for their emissions.

The SJVAPCD has adopted several attainment plans to achieve State and Federal air quality standards. The SJVAPCD continuously monitors the region's progress implementing attainment plans and periodically reports to CARB and the EPA. Finally, SJVAPCD periodically revises attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the CCAA and Clean Air Act Amendments (CAAA).

2.1.3.1 Air Quality Management Plans

The following are State plans that have been adopted by the SJVAPCD.

Ozone Plans:

Extreme 1-Hour Ozone Attainment Demonstration Plan

This plan, adopted by the SJVAPCD board in 2004, sets forth measures and emission reduction strategies designed to attain the Federal 1-hour ozone standard by November 15, 2010. This plan was approved by the EPA on March 8, 2010; however, the EPA's approval was subsequently withdrawn effective November 26, 2012, in response to a decision issued by the U.S. Court of Appeals for the Ninth Circuit (Sierra Club v. EPA, 671 F.3d 955) remanding EPA's approval of these State Implementation Plan revisions. Concurrent with EPA's final rule, CARB is withdrawing the Plan. On May 6, 2014, the SJVAPCD submitted a formal request to the U.S. EPA, asking that the EPA determine the SJVAB has attained the Federal 1-hour ozone standard which was revoked in 1997.

2007 8-Hour Ozone Plan

This plan sets forth measures and a "dual path" strategy to attain the federal 8-hour ozone standard for the SJVAB by reducing emissions on ozone and particulate matter precursors. The plan also includes provisions for improved pollution control technologies for mobile and stationary sources, as well as an increase in State and federal funding for incentive-based measures to reduce emissions. All local measures were to be adopted by the SJVAPCD before 2012. This plan was approved by the EPA on March 1, 2012. On November 26, 2012, however, the EPA withdrew its determination that the plan satisfied the Clean Air Act requirements regarding emission growth caused by growth in vehicle-miles traveled. All other determinations in the EPA's March 1, 2012, rule approving the plan remain unchanged and in effect.

2016 Ozone Plan for 2008 8 Hour Ozone Standard

In order to meet the December 31st, 2031 deadline for attainment, this plan incorporates emissions reduction strategies for stationary sources including regulatory actions; incentive programs; technology advancement programs; policy and legislative activities; public outreach, education, and communication; and undefined strategies under "black box" provisions. The plan demonstrates that existing regulations go above and beyond the Federal Reasonably Available Control Technology (RACT) requirement. The plan also emphasizes that mobile source emissions, which fall under state and federal jurisdiction, make up over 85% of the Valley's NOx emissions. For this reason, the District requested that CARB and EPA adopt and implement strategies so that sources outside District authority would be controlled enabling the standard to be met without the need for "black box" provisions. Moreover, the plan states that CARB and EPA action will be essential to attainment with the AAQS.

2020 Reasonable Available Control Technology (RACT) Demonstration for the 2015 8-Hour Ozone Standard

The 2020 RACT Demonstration (The Demonstration) includes a comprehensive evaluation of all NOx and VOC District rules to ensure that each rule meets or exceeds RACT. District rules were reviewed and compared to federal, state, and local regulations. State suggested control measures and technology clearinghouses were revised to ensure major sources and EPA Control Technique Guidelines sources in the jurisdiction of the SJVAPCD were subject to RACT. The Demonstration fulfills the federal Clean Air Act requirements and demonstrates that all federal RACT requirements are satisfied by SJVAPCD rules.

Particulate Matter Plans:

2007 PM_{10} Maintenance Plan

On October 25, 2007, CARB approved the SJVAPCD's 2007 PM_{10} Maintenance Plan and Request for Redesignation with modifications to the transportation conformity budgets. On September 25, 2008, the EPA redesignated the SJVAB to attainment for the PM_{10} NAAQS and approved the PM_{10} maintenance plan.

2012 $PM_{2.5}$ Plan

The US EPA set the first $PM_{2.5}$ standard in 1997 and in 2005 designated the Valley as nonattainment for the 1997 standard. The 1997 standard has two limits of attainment: an annual average of 15 µg/m³ and a 24-hour average of 65 µg/m³. The SJVAPCD adopted the 2008 $PM_{2.5}$ Plan in April 2008 to demonstrate how the Valley

would come into attainment of the 1997 $PM_{2.5}$ standard by no later than April 2015. US EPA subsequently lowered the 24-hour standard to 35 µg/m³ in 2006 and re-issued the nonattainment designation for the San Joaquin Valley in 2009. Through continued implementation of the 2008 $PM_{2.5}$ Plan, the San Joaquin Valley was expected to be in attainment of the 1997 annual standard by 2015.

The 2012 $PM_{2.5}$ Plan builds on the prior $PM_{2.5}$ plans and demonstrates attainment of the newer 2006 24-hour $PM_{2.5}$ standard by the federal attainment deadline of 2019, with the majority of the Valley actually experiencing attainment ahead of 2019. The SJVAPCD, in collaboration with CARB, based this attainment demonstration on comprehensive analysis, careful evaluation, and a sound scientific foundation. Using the SJVAPCD Governing Board's guiding principles adopted in February 2012, this plan emphasizes public health as the number one priority in meeting federal ambient air quality standards (NAAQS).

The 2012 $PM_{2.5}$ Plan is a multifaceted strategy that utilizes a combination of conventional and innovative control strategies to reduce emissions of $PM_{2.5}$ and other pollutants that form $PM_{2.5}$. The San Joaquin Valley's successes in adopting regulations and other strategies that have improved the San Joaquin Valley's air quality provide the foundation for the Plan. In developing the Plan, the SJVAPCD claims to have left "no stone unturned" in evaluating all sources of emissions for potential strategies to reduce emissions.

In addition to reducing direct emissions of $PM_{2.5}$, the 2012 $PM_{2.5}$ Plan focuses on reducing oxides of nitrogen (NO_x) emissions, which is a predominant pollutant not only in the formation of $PM_{2.5}$ in the San Joaquin Valley, but is also the focus of SJVAPCD's ozone reduction strategies. This overlapping significance and emphasis on reducing NO_x emissions helps to address both of the San Joaquin Valley's biggest air quality challenges, $PM_{2.5}$ and ozone. Along with comprehensive efforts at the local level to reduce emissions, reducing mobile source emissions that are not under the direct authority of SJVAPCD are critical to attaining the standard, and the 2012 $PM_{2.5}$ Plan includes State and federal measures that will provide significant new emissions reductions in the coming years. As outlined below, the plan's comprehensive control strategy includes regulatory actions, incentive programs, technology advancement, policy and legislative positions, public outreach, participation and communication, and additional strategies.

2015 Plan for the 1997 $PM_{2.5}$ Standard

The 2015 Plan for the 1997 $PM_{2.5}$ Standard was adopted on April 16, 2015, and addresses the EPA annual $PM_{2.5}$ standard of 15 µg/m3 as well as the EPA 24-hour $PM_{2.5}$ standard of 65 µg/m3 both of which were established in 1997. The plan's strategy focuses on attaining the standard quickly, as well as prioritizing $PM_{2.5}$ emissions that pose the most health risk to residents.

2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard

The 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard was adopted by the District on September 15, 2016. This plan addresses the $PM_{2.5}$ NAAQS of 12 µg/m³ with an attainment deadline of December 31, 2021, established in 2012. This plan demonstrates the impracticability of attainment before the deadline and requests the area be reclassified from moderate to serious nonattainment.

2018 Plan for the 1997, 2006 and 2012 $PM_{2.5}$ Standards

Adopted on November 15, 2018, the plan includes significant incentive-based control measures as well as control measures for stationary and area industrial sources. The plan also calls on CARB to act in order to achieve reductions of mobile sources.

SB 656 Particulate Matter Control Measure Implementation Schedule

Senate Bill (SB) 656 was enacted in 2003 and codified as Health and Safety Code Section 39614. SB 656 seeks to reduce exposure to PM_{10} and $PM_{2.5}$ and make further progress toward attainment of the NAAQS and CAAQS for PM_{10} and $PM_{2.5}$. SB 656 required CARB, in consultation with local air districts, to develop and adopt lists of "the most readily available, feasible, and cost-effective" particulate matter control measures. Subsequently, air districts were required to adopt implementation schedules for relevant control measures. In June 2005, the SJVAPCD adopted its SB 656 Particulate Matter Control Measure Implementation Schedule, and has adopted each relevant strategy into their rules.

2.1.3.2 SJVAPCD Rules and Regulations

The following SJVAPCD rules and regulations are applicable to Project sources. Rule summaries are provided to clarify applicability, and excludes rules that do not apply which are numerous and exhaustive.

Regulation I (General Provisions):

Rule 1160 (Emission Statements)

Rule 1160 requires owners/operators of stationary sources that emit NO_X or ROG to submit annual emission inventories. More information can be found in the Air Resources Board's "Instructions for the Emission Data System Review and Update Report" document (California Air Resources Board, 1988).

Regulation II (Permits):

Rule 2010 (Permits Required)

Rule 2010 requires, prior to construction, any newly proposed air-polluting facilities to first obtain an Authority to Construct from the Air Pollution Control Officer. Prior to operation of the new facility, the SJVAPCD also requires that any new facility obtain a Permit to Operate from the Air Pollution Control Officer. Permits to Operate must be posted and maintained on or near the source of the air pollution.

Rule 2201 (New and Modified Stationary Source Review)

Rule 2201 establishes SJVAPCD's program to limit emissions at new and modified sources so that there is no net increase in emissions within the SJVAB. Rule 2201 uses BACT and mechanisms such as emissions offsets, to ensure that AAQS are met or maintained. Criteria pollutants are regulated under this Rule, including VOC, NO_x, SO_x, PM_{10}, $PM_{2.5}$, and CO. Under Rule 2201, BACT is required if the emissions of a regulated pollutant would exceed two pounds per day. In addition, emission offsets to mitigate an increase in emissions from a new or modified stationary source would be required if the facility's emissions exceed the following amounts:

- 20,000 pounds per year of NO_x or VOC;

- 200,000 pounds per year of CO;
- 54,750 pounds per year of SO_x; or
- 29,200 pounds per year of PM_{10}.

Project equipment that would be subject to this rule includes stationary sources such as diesel engines and processing units of the aggregate plant, and stockpiles.

This rule also includes significance thresholds for Federal Major Modifications at Major Source facilities. The previous facility in the baseline was not a Major Source. This facility is functionally equivalent, and therefore there is no reason to believe this facility would be a Major Source. Additionally, the annual emissions of this facility in the Project do not exceed offset thresholds. Determination of Major or Non-Major Source is based on emissions calculated and discussed in Sections 2.4.6, 2.4.4, and 2.4.5.

Rule 2280 (Portable Equipment Registration)

Rule 2280 outlines the procedure and requirements associated with the registration of portable emissions units. Sand and gravel screening, rock crushing, and RAP crushing operations are among operations eligible for registration of portable equipment, if a portable diesel-fired engine will be used to power processing equipment. Rule 2280 would be applicable to the Project if temporary construction requires equipment (such as a generator set) under Rule 2280.

Regulation III (Fees):

Regulation III contains rules related to District fees. The Project may be subject to fees related to permitting, air toxics, dust, ozone, as well as others.

Regulation IV (Prohibitions):

Rule 4001 (New Source Performance Standards)

Rule 4001 codifies the SJVAPCD's adoption and incorporation of Federal New Source Performance Standards (NSPS) as set forth in 40 CFR Part 60. NSPS apply to a variety of stationary sources, including asphalt plants and aggregate processing plants. However, this Project does not trigger the thresholds to be subject to this rule. If subject to this rule, the regulation imposes emissions standards for relevant pollutants and requires that specified emission performance standards, control equipment, and monitoring devices be installed at all new, modified, or reconstructed facilities to limit emissions. The regulation includes test methods, monitoring, notification, and recordkeeping requirements. The aggregate plant is subject to 40 CFR Part 60, Subpart OOO, which is discussed above in Section 2.1.1.1.

Rule 4002 (National Emission Standards for Hazardous Air Pollutants)

Rule 4002 incorporates the National Emission Standards for Hazardous Air Pollutants (NESHAPs) as set forth in 40 CFR Part 61, and the NESHAPs for source categories as set forth in 40 CFR Part 63. 40 CFR Part 61 includes emission standards for several known toxic air pollutants, such as beryllium, mercury, and vinyl chloride. 40 CFR Part 63 regulates NESHAP by source categories. Both regulations also include test methods and

procedures, as well as monitoring, notification, and recordkeeping requirements. These requirements would be applicable to diesel engines used by the Project.

Rule 4101 (Visible Emissions)

Rule 4101 prohibits emissions of visible air contaminants from any potential source of air contaminants. The rule prohibits air contaminants, other than water vapor, from resulting in greater than Number 1 on Ringelmann Chart (i.e., 20 percent opacity) for a combined period of more than 3 minutes of any hour.

Rule 4102 (Nuisance)

To protect the public health, Rule 4102 prohibits any person from discharging such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. Odors are typically addressed under this rule.

Rule 4201 (Particulate Matter Concentration)

To protect the ambient air quality, Rule 4201 establishes a particulate matter emission standard. A release or discharge of dust, fumes, or total suspended particulate matter emissions into the atmosphere from any single-source operation may not exceed 0.1 gr/dscf. Rule 4201 includes test methodology to determine the particulate concentration in an exhaust stream.

Rule 4202 (Particulate Matter Emission Rate)

Rule 4202 limits particulate matter emissions and applies to any source operation that emits or may emit particulate matter. The rule specifies allowable emissions rates based on process weight rate calculations.

Rule 4301 (Fuel Burning Equipment)

Rule 4301 limits the emission of air contaminants from fuel burning equipment. Included in this rule are requirements that fuel burning equipment not discharge:

- Combustion contaminants exceeding 0.1 gr/dscf at 12% carbon dioxide;
- Discharge greater than 200 lbs per hour of sulfur compounds;
- Discharge greater than 140 pounds per hour of nitrogen compounds; or,
- Discharge greater than 10 pounds per hour of combustion contaminants.

Rule 4623 (Storage of Organic Liquids)

Rule 4623 limits VOC emissions from the storage of organic liquids. The rule applies to any tank of organic liquid with a capacity of 1,100 gallons or greater, and requires that such tanks include VOC control systems. The rule includes maintenance, recordkeeping, and testing requirements. However, tanks exclusively receiving and/or storing an organic liquid with a true vapor pressure (TVP) less than 0.5 pound per square inch absolute (e.g., diesel fuel, lubricating and hydraulic oils) are exempt from all other requirements of the rule except for complying with the provisions for (1) TVP and API gravity testing, (2) recordkeeping, and (3) test methods.

Regulation VIII (Fugitive PM_{10} Prohibitions):

The rules under Regulation VIII are intended to reduce ambient concentrations of particulate matter (PM_{10} or larger) and were developed pursuant to EPA guidance for Serious PM_{10} Nonattainment Areas. These rules are applicable to specified anthropogenic sources. Applicability of each rule is discussed below and requirements are presented for rules that apply to the Project. Rule 8081 is omitted because it only applies to agricultural sources.

Rule 8011 (General Requirements)

Rule 8011 contains resources referenced by other rules in Regulation VIII including definitions of terms (74), exemptions (4), general requirements related to road dust controls (4), test methods for visual opacity (2) and surface stabilization (6) included as appendices to the Rule, a recordkeeping requirement, and provision allowing operators to implement a Fugitive PM_{10} Management Plan (FPMP) that is designed to achieve 50% control efficiency that has been approved by the APCO.

Rule 8021 (Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities)

Rule 8021 prohibits construction, demolition, excavation, extraction, or other earthmoving activities unless the appropriate requirements are sufficiently implemented to limit visible dust emissions (VDE) to 20% opacity.

Rule 8031 (Bulk Materials)

Rule 8031 requires any facility that performs outdoor handling, storage, and transport of bulk materials to use appropriate methods as listed in Rule 8031 to limit VDE to 20 percent opacity or to comply with the conditions for a stabilized surface as defined in Rule 8011 (General Requirements). Appropriate methods to limit VDE listed in Rule 8031 include:

- Applying water or chemical/organic stabilizers/suppressants;
- Constructing and maintaining sufficient barriers to obstruct wind;
- Storing materials on stabilized surfaces; covering bulk materials with tarps, plastic, or other suitable material; limiting on-site vehicle speed;
- Loading haul trucks to limit VDE;
- Applying water on the top of loads to limit VDE;
- covering haul trucks with tarps or other covers to limit VDE; and
- Maintaining haul trucks to prevent spillage or loss of bulk materials.

Rule 8041 (Carryout and Trackout)

The purpose of Rule 8041 is to prevent or limit fugitive dust emissions from carryout and trackout on paved public roads or the paved shoulders of paved public roads. Facilities subject to Rules 8021, 8031, 8061, or 8071 must also comply with this rule. Rule 8041 requires that affected facilities prevent and/or clean up carryout and trackout at the end of each workday. Cleanup of carryout and trackout is accomplished by manually sweeping and picking up, operating a rotary brush or broom accompanied by sufficient wetting to limit VDE to 20% opacity, operating a PM_{10}-efficient street sweeper that has a pick-up efficiency of at least 80%, or flushing with water if curbs and gutters are not present and where the use of water will not result in a source of trackout material or other adverse impacts, such as a water quality violation under the National Pollutant Discharge

Elimination System program. Rule 8041 requires that owners/operators of sites with paved interior roads use a trackout control device to reduce carryout and trackout. Rule 8041 prohibits the use of blower devices, dry rotary brushes, or brooms for removal of carryout and trackout on public roads.

Rule 8051 (Open Areas)

The purpose of Rule 8051 is to limit fugitive dust emissions from open areas. The rule applies to any open area having 0.5 acre or more within urban areas, or 3.0 acres or more within rural areas, and that contains at least 1,000 square feet of disturbed surface area. Whenever open areas are disturbed or vehicles are used in open areas, an owner/operator must implement one or a combination of control measures to comply with the conditions of a stabilized surface at times and to limit VDE to 20 percent opacity. Control measures to be used include applying and maintaining water or dust suppressant(s) to unvegetated areas or establishing vegetation on previously disturbed areas; or paving, applying, and maintaining gravel, or applying and maintaining chemical/organic stabilizers/suppressants. Where open areas are disturbed due to trespass, such activities should be prevented by posting "No Trespassing" signs or installing physical barriers such as fences.

Rule 8061 (Paved and Unpaved Roads)

The purpose of Rule 8061 is to limit fugitive dust emissions from paved and unpaved roads by implementing control measures and design criteria. This rule applies to any new or existing public or private paved or unpaved road, road construction project, or road modification project. Rule 8061 requires that new or modified paved roads have certain specifications based on the road's existing or projected annual average daily trips (AADT). Requirements include minimum paved or stabilized shoulder widths, as well as curbing, intersection, and median specifications. The rule prescribes requirements for maintenance of public paved roads, including specifications for PM_{10}-efficient sweepers and road cleanup. Rule 8061 also includes requirements for unpaved road segments. Unpaved road segments with 26 or more AADT must stabilize road surfaces by application of water, chemical dust suppressant, washed gravel, or similar measures. In addition, the visible dust emissions associated with such areas is limited to 20 percent opacity. Unpaved roads with fewer than 26 AADT are exempt from some requirements of this rule.

Rule 8071 (Unpaved Vehicle/Equipment Traffic Areas)

This rule limits fugitive dust emissions from unpaved vehicle and equipment traffic areas. Unpaved vehicle and equipment traffic areas with 50 or more AADT must stabilize road surfaces by application of water, chemical dust suppressant, washed gravel, or similar measures. In addition, the visible dust emissions associated with such areas is limited to 20 percent opacity. Unpaved vehicle and equipment traffic areas with less than 50 AADT are exempt from Rule 8071.

2.1.3.3 CEQA Guidance

The SJVAPCD Air Quality Modeling: Permitting and CEQA webpage[2] links to documents prepared by the District and others and notes that modeling guidance provided by the SJVAPCD is dated and may not be the best approach if one is trying to use currently accepted methods such as those employed by OEHHA. For this reason,

[2] http://valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm#modeling_guidance

the Report has been written with the Air Toxics Hotspots Program Guidance Manual for the Preparation of Risk Assessments (OEHHA, 2015).

2.1.4 Tulare County General Plan Air Quality Policies

The Tulare County General Plan has a number of policies for air quality. General Plan policies that apply to the Project are listed below.

AQ-1.1 Cooperation with Other Agencies

The County shall cooperate with other local, regional, Federal, and State agencies in developing and implementing air quality plans to achieve State and federal Ambient Air Quality Standards. The County shall partner with the SJVAPCD, Tulare County Association of Governments (TCAG), and the California Air Resource Board to achieve better air quality conditions locally and regionally.

AQ-1.2 Cooperation with Local Jurisdictions

The County shall participate with cities, surrounding counties, and regional agencies to address cross-jurisdictional transportation and air quality issues.

AQ-1.3 Cumulative Air Quality Impacts

The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to propose alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.

AQ-1.4 Air Quality Land Use Compatibility

The County shall evaluate the compatibility of industrial or other developments, which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.

AQ-1.5 California Environmental Quality Act (CEQA) Compliance

The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonable mitigated when feasible.

AQ-1.7 Support Statewide Climate Change Solutions

The County shall monitor and support the efforts of CalEPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code § 38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

AQ-4.1 Air Pollution Control Technology

The County shall utilize the BACM and RACM as adopted by the County to support SJVAPCD air quality attainment plans to achieve and maintain healthful air quality and high visibility standards. These measures shall be applied to new development approvals and permit modifications as appropriate.

AQ-4.2 Dust Suppression Measures

The County shall require developers to implement dust suppression measures during excavation, grading, and site preparation activities consistent with SJVAPCD Regulation VIII – Fugitive Dust Prohibitions. Techniques may include, but are not limited to, the following:

1. Site watering or application of dust suppressants,
2. Phasing or extension of grading operations,
3. Covering of stockpiles,
4. Suspension of grading activities during high wind periods (typically winds greater than 25 miles per hour), and
5. Re-vegetation of graded areas.

AQ-4.3 Paving or Treatment of Roadways for Reduced Air Emissions

The County shall require that all new roads be paved or treated to reduce dust generation where feasible as required by SJVAPCD Regulation VIII, Rule 8061- Paved and Unpaved Roads. For new projects with unpaved roads, funding for roadway maintenance shall be adequately addressed and secured.

AQ-4.5 Public Awareness

The County shall promote public awareness of the seriousness and extent of the existing air quality problems

2.2 Environmental Setting

The environmental setting includes the physical setting against which changes that would occur with the Project are compared in order to determine the Project's potential air quality impact. The environmental setting also includes factors that influence the setting such as meteorology, geography, and the locations of emission sources and receptors. Frequency and severity of high pollutant concentrations in the air as well result in adverse health effects which are also part of the physical setting and the primary reason for regulating air pollutants. Air quality standards are set at levels where that will protect health, including the health of sensitive populations. Descriptions of regional and Project site air quality are provided in this section.

2.2.1 Regional Setting

The Project site is located in the San Joaquin Valley within the central portion of the San Joaquin Valley Air Basin (SJVAB) under the jurisdiction of the SJVAPCD. The SJVAPCD's jurisdictional area is shown on Figure 3 (Appendix A).

Air pollution is directly related to several factors including a region's topographic features. The SJVAB is defined by the Sierra Nevada Mountain range in the east (8,000 to 14,000 feet in elevation), the Coast Range in the

west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the Pacific Ocean at the Carquinez Strait, where the San Joaquin-Sacramento Delta empties into San Francisco Bay.

Although marine air generally flows into the basin from the San Joaquin River delta, the region's topographic features restrict air movement within the basin. The Coast Range hinders wind access into the valley from the west, the Tehachapi Mountains prevent southerly passage of air, and the Sierra Nevada Mountain range to the east is a barrier to air movement. These topographic features result in weak air flow, which becomes blocked vertically by high barometric pressure over the valley. As a result, the SJVAB is susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500 to 3,000 feet).

During the summer season, wind usually originates at the north end of the Valley, through Tehachapi Pass into the Southeast Desert Air Basin (Figure 4, Appendix A). During the winter, wind occasionally originates in the south end of the Valley and flows in a north-northwesterly direction. Also, during the winter months, the Valley experiences light, variable winds, less than 10 miles per hour (mph). Low wind speeds combined with low inversion layers in the winter create a climate conducive to the accumulation of CO and PM_{10} (County of Fresno, 2011).

According to Western Regional Climate Center (WRCC), the Lemon Cove Station (044890) located within 1 mile from the Project site, is the nearest climatological monitoring station. Based on the period of record (1/1/1899 to 1/20/2015), average monthly temperature has ranged from a minimum of 36.9° Fahrenheit (F) to a maximum of 99.3° F. December and January are typically the coldest months with July and August the warmest (WRCC, 2015).

The annual rainfall totals approximately 14.4 inches and mostly occurs between November and April (WRCC, 2015). Summer rainfall is minimal and generally limited to scattered thundershowers over the Sierra Nevada Mountain range.

SJVAPCD, together with CARB, maintains ambient air quality monitoring stations in the Tulare County area. Data collected at permanent monitoring stations are used by the US EPA to classify regions as "attainment" or "nonattainment," depending on whether the regions met the requirements stated in the primary federal and state AAQS. The San Joaquin Valley is a single air quality nonattainment area. The attainment status in Tulare County area and the SJVAB is shown in Table 5.

Table 5 San Joaquin Valley Attainment Status

Pollutant	Federal Designation[a]	State Designation[b]
Ozone - One hour	No Federal Standard[f]	Nonattainment/Severe
Ozone - Eight hour	Nonattainment/Extreme[e]	Nonattainment
PM_{10}	Attainment[c]	Nonattainment
$PM_{2.5}$	Nonattainment[d]	Nonattainment

Pollutant	Federal Designation[a]	State Designation[b]
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead (Particulate)[h]	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Vinyl Chloride[h]	No Federal Standard	Attainment

Source: San Joaquin Valley Unified APCD (SJVAPCD, 2020)

a. See Code of Regulations (CFR) 40 CFR, Part 81
b. See CCR Title 17 Sections 60200-60210
c. On September 25, 2008, the EPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.
d. The Valley is designated nonattainment for the 1997 federal $PM_{2.5}$ standards. The EPA released final designations for the 2006 $PM_{2.5}$ standards in December 2008 (effective in 2009), designating the Valley as nonattainment for the 2006 $PM_{2.5}$ standards.
e. Though the SJVAB was initially classified as "nonattainment/Serious" for the 1997 8-hour ozone standard, the EPA approved a reclassification to "extreme nonattainment" on May 5, 2010 (effective June 4, 2010).
f. Effective June 15, 2005, the EPA revoked the federal 1-hour ozone standard, including associated designations and classifications. However, the EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

2.2.2 Local Setting

McKay Point, the Project site, is approximately 200 acres located adjacent to where the Lower Kaweah River and St. Johns River diverge. The Project is approximately one mile northwest of the community of Lemon Cove and west of the intersection of State Routes 198 and 216 in Tulare County, California.

SJVAPCD maintains ambient air quality monitoring stations throughout the SJVAB in order to measure compliance with NAAQS/CAAQS. Not all air pollutants are monitored at each station; thus, data from the closest representative station that monitors a specific pollutant are used is reported in Table 6.

The closest ambient air quality monitoring station to the Project site is the Visalia station. This station is located approximately 13.6 miles west-southwest of the Project site and measures O_3, PM_{10}, and $PM_{2.5}$. The station is constructed to monitor at a "neighborhood scale", defined by the EPA as a station covering an area between 0.5 and 4.0 square kilometers (0.3 to 2.5 miles) in range. Data is collected for the purpose of observing a representative concentration for the neighborhood within which the monitoring station is located.

Air quality at the Project site is expected to be better than air quality at the Visalia monitoring station because the monitoring station is located within an urban area where there are more emissions sources. The Project site and surrounding lands are characterized as rural with few air emissions sources and so one would expect fewer hot spots and/or near field exposures as compared to more urban areas where there are many sources and where ambient measurements are collected. Regional pollutant (e.g., ozone and $PM_{2.5}$) concentrations measured at the Visalia station conservatively represent concentrations on-site because these amounts are

added to Project concentrations and to cumulative concentration is compared to the AAQS in order to determine the Project's impact.

Ambient concentrations and number of days when the primary air quality standards were exceeded are presented in Table 6 and Table 7. Carbon monoxide and sulfur dioxide are not presented in these tables because the pollutants are not currently monitored within Tulare County and concentrations measured at all monitoring stations within SJVAB have been less than State or Federal standards over the past five years. Ozone levels exceeded the State one-hour and eight-hour standards and the federal eight-hour standard in each of the past five years. PM_{10} levels exceeded only the state standard in the last five years. $PM_{2.5}$ levels exceeded the federal standard for the past five years. A summary of all ambient air quality standards is presented in Table 1.

Table 6 Ambient Air Quality in the Project Area

Concentration and Averaging Period	Ambient Air Quality Standard	2015	2016	2017	2018	2019
Ozone 1-hr	0.09 ppm (State, max.)	0.110	0.098	0.109	0.112	0.093
Ozone 8-hr	0.070 ppm (State, max.)	0.079	0.080	0.083	0.085	0.084
	0.070 ppm (Fed., 4th high)	0.091	0.083	0.092	0.095	0.082
NO_2 1-hr	0.18 ppm (State, max.)	0.0623	0.0575	0.0581	0.0692	0.0707
	0.100 ppm (Fed., 98th %ile)	0.0456	0.0459	0.0556	0.0529	0.055
NO_2 Annual	0.030 ppm (State) 0.053 ppm (Fed.)	0.009	NA	0.010	0.010	0.009
PM_{10} 24-hr	50 µg/m^3 (State, max.)	140.3	132.5	145.7	159.6	418.5
	150 µg/m^3 (Fed., 2nd high)	67.3	137.1	144.8	153.4	411.1
PM_{10} Annual	20 µg/m^3 (State)	NA	NA	46.9	52.0	46.3
$PM_{2.5}$ 24-hr	35 µg/m^3 (Fed., 98th %ile)	45.8	40.7	74.6	63.4	45.5
$PM_{2.5}$ Annual	12 µg/m^3 (State, max.)	NA	15.5	16.8	17.4	12.2
	12.0 µg/m^3 (Fed., 3 Yr Avg.)	17.6	16.2	15.7	16.1	15.5

*Data Not Available

Source: Trends Summary for O_3, PM_{10}, $PM_{2.5}$ and Top 4 Summary for NO_2. (CARB, 2020).

Max. = Maximum. Hr = Hour. Fed. = Federal. ppm = parts per million. µg/m3 = micrograms per cubic meter.

4th high = Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.

2nd high = Not to be exceeded more than once per year on average over 3 years.

98th %ile = 98th percentile of: 1-hour daily maximum concentrations for the 1-hr NO_2 NAAQS; and of 24-hour average concentrations for PM_{10} and $PM_{2.5}$, averaged over 3 years.

ND – insufficient data available to determine. NA – data are not available from the listed sources.

Carbon monoxide and sulfur dioxide are not presented in these tables because the pollutants are not currently monitored within Tulare County and concentrations measured at all monitoring stations within the Air Basin have been less than State or federal standards over the past five years.

Table 7 Number of Days Exceeding Air Quality Standards

Monitoring Site	Year	Days Exceeding State 1-Hour O_3	Days Exceeding State 8-Hour O_3	Days Exceeding Federal 8-Hour O_3	Days Exceeding State 24-Hour PM_{10}[a]	Days Exceeding Federal 24-Hour $PM_{2.5}$[a]
Visalia	2015	9	52	49	59.4	ND
	2016	1	19	18	68.8	ND
	2017	9	65	61	89.3	135.9
	2018	8	58	53	94.0	164.4
	2019	0	26	22	ND	115.8

Source: Trends Summary (CARB, 2020).

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and 3 days, respectively. "Numbers of days exceeding the standards" are mathematical estimates.

ND – insufficient data available to determine.

2.2.3 Health Effects Setting

NAAQS/CAAQS and Reference Exposure Levels (REL) that are used for health risk assessment are designated for each pollutant at a level where no "adverse health effect" would occur to sensitive populations. The OEHHA relies upon the definition of "adverse health effect" published by American Thoracic Society (ATS). ATS published a definition in 1985 and then amended the definition in 2000 to address issues not covered by the 1985 definition. From the 1985 definition, "adverse respiratory health effect" means:

> *Medically significant physiologic or pathologic changes generally evidenced by one or more of the following:*
> 1. *Interference with the normal activity of the affected person or persons;*
> 2. *Episodic respiratory illness;*
> 3. *Incapacitating illness;*
> 4. *Permanent respiratory injury; and/or*
> 5. *Progressive respiratory dysfunction* (OEHHA, 2004).

As discussed by OEHHA, the 2000 ATS publication (see copy in Appendix B) recommended that the following "dimensions" of adverse effects be considered when determining an adverse health effect:

1. *Biomarkers: These should be considered; however, it must be kept in mind that few biomarkers have been validated sufficiently to establish their use for defining a point at which a response becomes adverse, consequently, not all changes in biomarkers should necessarily be considered adverse.*
2. *Quality of life: In recent years, decreased health-related quality of life has become widely accepted as an adverse health effect. The review committee concluded that reduction in quality of life, whether in healthy persons or persons with chronic respiratory disease, should be considered as an adverse effect.*

3. *Physiological impact: The committee recommended that small, transient reductions in pulmonary function should not necessarily be regarded as adverse, although permanent loss of lung function should be considered adverse. The committee also recommended that reversible loss of lung function in conjunction with symptoms should be considered adverse.*
4. *Symptoms: Air pollution-related symptoms associated with reduced quality of life or with a change in clinical status (i.e., requiring medical care or a change in medications) should be considered adverse at the individual level. At the population level, the committee suggested that any detectable increase in symptom frequency should be considered adverse.*
5. *Clinical outcomes: Detectable effects of air pollution on clinical measures should be considered adverse. More specifically, the ATS committee cited as examples increases in emergency department visits for asthma or hospitalizations for pneumonia, at the population level, or an increased need to use bronchodilator medication, at the individual level. The committee recommended that: "no level of effect of air pollution on population-level clinical indicators can be considered acceptable."*
6. *Mortality: Increased mortality should clearly be judged as adverse.*
7. *Population health versus individual risk: The committee concluded that a shift in risk factor distribution, and hence the risk profile of an exposed population, should be considered adverse when the relationship between the risk factor and the disease is causal, even if there is no immediate occurrence of obvious illness* (OEHHA, 6/2004).

Based on these recommendations, many health outcomes found to be associated with criteria pollutants could be considered adverse, including pulmonary function changes accompanied by symptoms, pulmonary function changes and respiratory symptoms that reduce quality of life, large changes in pulmonary function, clinical outcomes such as emergency department visits for asthma, hospitalization for respiratory and cardiovascular disease, and mortality. In addition, outcomes such as increase in airway reactivity and inflammation may be considered adverse if they signify increases in the potential risk profile of the population.

> *With regard to sensitivity, the 1970 Clean Air Act recognized that some persons were so ill as to need controlled environments, e.g., persons in intensive care units or newborn infants in nurseries; the act stated that the standards might not necessarily protect such individuals. It further stated, however, that the standards should protect "particularly sensitive citizens such as bronchial asthmatics and emphysematics who in the normal course of daily activity are exposed to the ambient environment.* (ATS, 2000).

Finally, according to ATS, research now shows that some highly susceptible individuals may respond to common exposures at or close to natural background pollutant levels that are often unavoidable.

2.3 Significance Thresholds

Determination of whether impacts exceed the Significance Thresholds is performed using the threshold criteria and methodologies established by the lead agency and/or air district.

2.3.1 CEQA Guidelines Appendix G

As stated, in the Appendix G Environmental Checklist, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations:

Would the project:

a) *Conflict with or obstruct implementation of applicable air quality plan?*
b) *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?*
c) *Expose sensitive receptors to substantial pollutant concentrations?*
d) *Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

The SJVAPCD guidelines, rules and regulations that were considered in the following determinations are discussed below in Section 2.3.2.

2.3.2 SJVAPCD Guidance

SJVAPCD recommends that application of the GAMAQI criteria when evaluating project specific impacts on air quality within the SJVAB. The SJVAPCD identifies threshold criteria that separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be temporary. The long-term emissions are mainly related to the activities that will occur indefinitely as a result of project operations. In addition, CEQA states another condition that could establish a project as having a significant effect on the environment is effects that are considered "cumulatively considerable." Threshold criteria for Project construction impacts, Project operations, and cumulative impacts are discussed below.

SJVAPCD Rules and Regulations

SJVAPCD recommends that air quality assessments reflect emission reductions achieved through compliance with SJVAPCD rules and regulations. The applicable SJVAPCD rules and regulations are provided in Section 2.1.4.

Regional Impacts from Criteria Pollutant Emissions

The quantities of pollutants above which SJVAPCD believes would have a significant effect on air quality are presented in Table 8. Impacts from construction, operational non-permitted equipment and activities, and operational permitted equipment and activities are evaluated independently from one another. The threshold criteria are applied on a calendar year basis. For construction emissions, the annual emissions are evaluated on a rolling 12-month period.

Localized Impacts from Criteria Pollutants and Toxic Air Contaminants

The thresholds of significance for Ambient Air Quality are based on the CAAQS and NAAQS. A project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of

an ambient air quality standard by exceeding any CAAQS/NAAQS. The standards are listed above in Table 1. Significance thresholds used by SJVAPCD are presented in Table 8.

Table 8 SJVACPD Threshold Criteria for Assessing Impacts

Criteria Pollutants			
Pollutant	Construction Phase [b] (ton/yr)	Operation Phase Permit-Required [c] (ton/yr)	Operation Phase Permit-Exempt [c] (ton/yr)
CO	100	100	100
NOx	10	10	10
ROG	10	10	10
SOx	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
Recommended Toxic Air Contaminants (TACs), Odor Thresholds[b]			
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 20 in 1 million Chronic & Acute Hazard Index ≥ 1.0 (project increment)		
Odor	More than one confirmed complaint per year averaged over a three-year period, or three unconfirmed complaints per year averaged over a three-year period. (Screening distance is one mile for HMA plants.)		
Ambient Air Quality Standards [d]			
Screening Criteria	100 lb/day of any criteria pollutant after implementation of mitigation measures.		
Modeling Criteria	If modeling is required because emissions exceed the screening criteria (100 lb/day), then the project would have a significant impact on an AAQS if the project concentration plus background concentration measured at the closest air monitoring station exceeds the most stringent AAQS or Significant Impact Level (SIL) in cases where background concentration already exceeds or nearly exceeds the AAQS.		

a Based on SJVAPCD "Air Quality Thresholds of Significance – Criteria Pollutants". (San Joaquin Valley Air Pollution Control District, 2015)

b Based on SJVAPCD "Recommended Thresholds of Significant Impact". (San Joaquin Valley Air Pollution Control District, 2012)

c Based on SJVAPCD "Ambient Air Quality Standards & Valley Attainment Status" (San Joaquin Valley Air Pollution Control District, n.d.)

d Based on SJVAPCD "Guidance for Assessing and Mitigating Air Quality Impacts". (SJVAPCD, 2015)

Screening Threshold for On-Site Emissions

In addition to the CAAQS/NAAQS, the GAMAQI contains Ambient Air Quality Screening Tools. Impacts require a detailed assessment when on-site emission increases from construction activities or operational activities exceed the 100 pounds per day (lb/day) screening level for each criteria pollutant evaluated after implementation of enforceable mitigation measures. Under such circumstance, the SJVAPCD recommends that an ambient air quality analysis be performed. An ambient air quality analysis uses air dispersion modeling to determine if emission increases from a project will cause or contribute to a violation of the ambient air quality standards.

For stationary source projects, the GAMAQI states that on-site construction emissions, on-site operational emissions from permitted equipment and activities, and on-site operational emissions from non-permitted equipment and activities each would be screened separately by comparison the 100 lb/day threshold.

Odors

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine if potential odors would have a significant impact. Rather, projects must be assessed on a case-by-case basis.

SJVAPCD GAMAQI recommends that all available pertinent information should be considered in order to qualitatively determine if a significant impact is likely to occur. SJVAPCD recommends that applicable information regarding the characteristics of the odor source be disclosed. Consideration of such parameters assists in evaluating the potential for odor impacts as a result of the proposed Project.

SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. These are presented in Table 9. Table 9 is used as a screening tool to qualitatively assess a project's potential to adversely affect area receptors. This list of facilities is not all-inclusive; however, aggregate mining and processing is not one of the facilities identified by the District as a potential source of significant odors.

Table 9 Screening Levels for Potential Odor Sources

Type of Facility	Distance (miles)
Wastewater Treatment Facilities	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating Operations (e.g., auto body	1
Food Processing Facility	1
Feed Lot/Dairy	1
Rendering Plant	1

Source: (SJVAPCD, 2015, p. 103).

Cumulative Impacts

By its very nature, air pollution has a cumulative impact. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Instead, a project's emissions may be

individually limited, but cumulatively considerable when taken in combination with past, present, and future development within the San Joaquin Valley Air Basin.

When assessing whether there is a new significant cumulative effect, SJVAPCD recommends that whether or not the incremental effects of the project are cumulatively considerable be evaluated. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects [14 CCR § 15064(h)(1)].

If the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located, then the project's incremental contribution to a cumulative effect is not cumulatively considerable (CEQA Guidelines §15064(h)(3)).

Cumulative Impacts Associated with Criteria Pollutants from Permitted Sources

SJVAPCD's attainment plans demonstrate that project-specific net emissions increase below NSR offset requirements will not prevent the District from achieving attainment. Consequently, emission impacts from sources permitted consistent with NSR requirements are not individually significant and are not cumulatively significant.

Cumulative Impacts Associated with Criteria Pollutants from Non-Permitted Sources

When determining cumulative significance, air quality impacts from all non-permitted equipment and activities emissions sources are to be considered when determining if project-specific emissions impacts would be individually significant. The SJVAPCD concludes that when activities and emissions from non-permitted sources are individually significant, they are also cumulatively significant.

Cumulative Impacts Associated with Toxic Air Contaminants

Impacts from TACs are localized impacts. SJVAPCD has established thresholds of significance for TACs that are extremely conservative and protective of health impacts on sensitive receptors. Because impacts from TACs are localized and the thresholds of significance for TACs have been established at such a conservative level, risks over the individual thresholds of significance are also considered cumulatively significant. No other cumulative risk thresholds apply.

2.4 Methodology

Guidelines and emissions thresholds established by the SJVAPCD in the GAMAQI (SJVAPCD, 2015) are used to assess impacts in this AQCCIA. The SJVAPCD also requires evaluation of cumulative air quality impacts, which are further discussed in Section 2.5.

2.4.1 Assumptions and Project Design Features

The impact assessment incorporated the following general assumptions:

- The excavation and associated equipment would operate in compliance with applicable air quality regulations.
    - Authorities to Construct and Permits to Operate would be obtained from the SJVAPCD for the portable crush/recycle and wash/screen plants at which time the equipment would be required to utilize Best Available Control Technology (BACT). It is anticipated that the plant would be equipped with water sprays at key emissions points.
    - Diesel engines would comply with applicable State regulations (i.e., air toxic control measures (ATCM)). This includes labeling of off-road equipment with registration numbers assigned by CARB, establishment of an idling policy, and limiting idle time to less than five minutes (13 CCR §2449).
    - A fugitive emission control plan would be implemented to comply with SJVAPCD Regulation VIII, "Fugitive PM_{10} Prohibition" and would include the following measures:
        i. The area to be excavated will be irrigated or sprayed by water trucks when visible dust is observed during excavation activities.
        ii. A water truck will be utilized to wet down the haul road from the excavation to the plant site as necessary to meet SJVAPCD fugitive dust requirements.
        iii. Records demonstrating compliance with fugitive dust requirements will be maintained for those days that a control measure was implemented and include the type of control measure(s) used, the location and extent of coverage, the date, the amount, and frequency of dust suppressant applied (Rule 8011, Section 6.2).
        iv. Limit visible dust emissions to 20 percent opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour and comply with the conditions for stabilized surface areas (Rule 8021, Section 5.0; Rule 8031, Section 5.0).
        v. Stabilize disturbed areas that are greater than 0.5 acres in size and which remain inactive for seven (7) days (Rule 8021, Section 5.2).
        vi. Stabilize stockpile surfaces (Rule 8031, Section 5.0).
        vii. Maintain a stabilized surface on the unpaved haul road (Rule 8021, Section 5.2).
        viii. During high wind conditions, cease excavation and other earthmoving activities that disturb the soil whenever visible dust emissions exceed 20 percent opacity. Continue operation of water trucks/control devices when activities cease, unless unsafe to do so. (Rule 8021, Section 5.4).
        ix. Prevent unauthorized vehicle disturbance of open areas by posting signs or installing physical barriers such as fences, gates, posts, and/or other appropriate barriers to effectively prevent access to the area(s) (Rule 8051, Section 5.0).

- The portable crush/recycle plant / diesel generator would be eligible registration in the CARB Portable Equipment Registration Program (PERP).

- The Project is located in Tulare County, which is among the counties listed as containing serpentine and ultramafic rock (OPR, 2000). However, the Project site is located on an alluvial deposit which does not contain serpentine or ultramafic rock and no NOA has been found on the Project site or in the vicinity of the Project.

- The Project would not store hazardous substances or acutely hazardous substances in quantities that would be subject to chemical accident prevention provisions of the CAA or the implementing regulation (40 CFR Part 68).

- Electricity is currently provided to the Project site by Southern California Edison (SCE).

Project Design Features

Project design features are aspects/activities of the Project that are already included in the design of the Project and will be implemented. The impact assessment incorporated the following Project design features:

- The Project will be managed such that there will be no increase in the production rate of aggregates from the baseline level. Therefore, the number of trucks traveling offsite on public roads will not increase from baseline.
- The Project will be managed so that when recycling and/or blending activities were taking place, the excavation and processing of aggregated would be reduced such that the total emissions associated with excavation/processing of aggregate combined with the emissions associated with the transport and processing/blending of recycled materials and additives would not result in an increase to baseline.
- The number of employees will not exceed the number of employees required for previous aggregate operations (baseline).
- The number of delivery and other non-aggregate trucks would be included in the total number of trucks coming/going from the site such that the total number of trucks would not exceed baseline.
- A slurry wall would be constructed as early as feasible during the excavation phase of the Project, to facilitate dry mining techniques.
- Activities associated with the Project will comply with all applicable rules and regulations.

2.4.2 Emissions Calculations Methodologies

Emissions from combustion sources associated with the Project including on- and non-road diesel engines are calculated in Appendix C using the methods presented below.

Emissions from dust sources associated with excavation phase of the Project including excavation/grading activities, aggregates processing (screen/wash plant & crush/recycle plant), stockpile/loadout areas, travel on

onsite unpaved roads, and wind erosion of stockpile areas are calculated in Appendix C using the methods presented below.

Non-Road Engines

Non-road engine emissions in off-road vehicles and dewatering pumps were calculated using the CalEEMod default method and emissions factors. Engine emissions rates decrease over time as the fleet is turned over and controls are implemented to comply with CARB regulations (i.e., In-Use Off-Road and Portable Engine ATCMs). Appendix A of the CalEEMod User Manual contains the following equation for quantifying off-road engine emissions.

$$Emissions_{DieselEx} = \sum_{i} (EF_i \times Pop_i \times AvgHP_i \times Load_i \times Activity_i)$$

Where:

EF = Emission factor in grams per horsepower-hour (g/bhp-hr)
Pop = Population, or the number of pieces of equipment.
AvgHP = Maximum rated average horsepower.
Load = Load factor.
Activity = Hours of operation.
i = Equipment type.

Emissions factors for the baseline were estimated based CalEEMod Appendix D Table 3.4: Off-road Emissions Factors. Baseline emissions factors were based on the 2005 operating years, and future emissions factors were based on the 2020 operating year. These assumptions are conservative as the majority of the baseline period takes place prior to 2005 (when engines had higher emissions) and the future excavation takes place after 2020 (when engines will have lower emissions).

The Project would use electricity currently being provided by SCE to power the wash/screen plant and a diesel generator to power a portable crush/recycle plant. The generators would need to be large enough to start the plant which is the mode of operation when peak power is used. Once each unit is in motion, inertia of the moving parts reduce the power required to continue steady-state operation. In order to minimize power required for start-up, equipment would be started in stages.

It is common for generators servicing aggregates plants to operate normally at 50% load with near 100% load occurring only temporarily during start-up as discussed above. Similarly, the electric motor rating are peak power requirements during start-up. For instance, a crusher with a 400 horespower (hp) electric motor normally operates at half that power level.

Given the above observations, it is assumed that a 1,015-horsepower generator would be needed for the portable crush/recycle plant. Furthermore, it is assumed that a 1,015-horsepower generator would be eligible for initial registration in the CARB Portable Equipment Registration Program (PERP) as a minimum standard that must be achieved in order to obtain a stationary source permit from SJVAPCD. Current PERP eligibility requirements can be found here: http://www.arb.ca.gov/portable/portable.htm.

On-Road Engines

Travel emissions rates for on-road trucks (T7 tractor vehicle class) were calculated from the Tulare County fleet emissions inventory reported by the online version of EMFAC2021. Emissions reported in grams per vehicle miles traveled (VMT) were multiplied by total VMT to determine emissions. A vehicle speed of 15 miles per hour was used to determine emissions rates for on-road trucks traveling on-site. On-road emissions onsite were conservatively omitted from the baseline model, as a majority of the haul route utilized in the baseline will also be used in the future. Emissions from on-road engines were calculated using the equation from Appendix A of the CalEEMod User Manual presented below.

$$Emissions_{Pollutant} = VMT \times EF_{Running,Pollutant}$$

Where:

Emissions $_{Pollutant}$ = Emissions from vehicle running for each pollutant.
VMT = Vehicle miles traveled.
$EF_{Running, Pollutant}$ = Emission factor for running emissions for each pollutant.

Excavation

Fugitive dust emissions generated during excavation, material processing, and material handling were calculated using the following methods.

Quarrying fugitive emissions were estimated using the San Diego Air Pollution Control District (SDAPCD) Default quarrying emissions factor of 0.021 lbs PM_{10} per ton of material quarried, as the SJVAPCD does not specify an emissions factor for quarried material.

Material dropping from the excavator to haul trucks and from the haul trucks to the ground emit fugitive dust. Material drop emissions were calculated using the CalEEMod default methodology which is based on the following emissions factor equation from AP-42 Section 13.2.4.

$$EF = k(0.0032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where: E = emission factor (lb/ton).
k = particle size multiplier (dimensionless: 0.35 for PM_{10}).
U = mean wind speed, (miles per hour [mph]).
M = material moisture content (%).

Moisture content of twelve percent (12%) is used which is the default value in CalEEMod and reflects the fact that materials are watered as necessary to control dust (i.e., no additional control efficiency for watering is applied to this source). The mean wind speed of 4.92 miles per hour (mph) is used based upon the mean wind speed for Tulare County in Table 1 of CalEEMod User's Guide Appendix D. Material drops from vehicles would continue to occur at the aggregate plant feed hopper in amounts equal to or less than those that occurred in

the baseline. Material drops also occur in processing plants and quantification of in-plant material drop emissions are discussed later in this subchapter.

Aggregates Processing Plants

Aggregates processing on the Project site would take place at an aggregate wash/screen plant, and as needed to crush larger pieces of aggregate at the crush/recycle plant. Plant equipment is briefly described below:

- Wash/Screen Plant (grid powered by SCE)
  - 1 hopper;
  - 1 wet screen;
  - 2 sand screws; and
  - 11 Conveyors.
- Crush/Recycle Plant (portable engine powered by diesel generator)
  - A hopper;
  - 2 crushers;
  - 2 screens; and
  - 15 conveyors.

Stockpile/Loadout Areas

Emissions from sources in these areas are calculated using the SJVAPCD's uncontrolled emissions factor of 5.27 lb-PM_{10}/acre-day and recommended 80% control efficiency for watering of stockpiles containing greater than one percent material smaller than 3/8-inch (SJVAPCD, 2013).

Travel on On-site Unpaved Roads

Road dust emissions are calculated using the CalEEMod and AP-42 emissions factor equations (Appendix E). AP-42 Section 13.2.2 (November 2006) contains the following emissions factor equation for vehicles traveling on unpaved roads at industrial sites:

$$E_{ext} = \left[k \left(\frac{s}{12} \right)^{0.9} \times \left(\frac{W}{3} \right)^{0.45} \right]$$

Where: E_{ext} = annual particulate emission factor (having units matching the units of k),
k = particle size multiplier units of interest (e.g., 1.5 lb/VMT for PM_{10}),
s = surface material silt content (%),
W = average weight (tons) of the vehicles traveling the road,

Unpaved road emissions were calculated for on-road trucks traveling on the Project site to haul material to the processing plants and processed product for export. The control efficiency for watering unpaved roads was assumed to be 80 percent based on AP-42 13.2.2 – Unpaved Roads, Figure 13.2.2-2 of AB-42. The silt content of the unpaved roads was assumed to be 4.8 percent per AP-42 Table 13.2.2-1 (Sand and Gravel Processing). Off-road truck weight (40 tons empty, 90 tons full) was obtained for a representative 50-ton capacity truck

from the Caterpillar Performance Handbook. On-road trucks were assumed to be 40 tons full and 15 tons empty with a capacity of 25 tons. Annual emissions were adjusted for rainfall, assuming 51 days a year exceeding 0.01 inch of rainfall (CAPCOA, 2013).

AP-42 Section 13.2.1 (January 2011) contains the following emissions factor equation for paved roads:

$$E_{ext} = [k(sL)^{0.91} \times (W)^{1.02}]$$

Where: E_{ext} = annual particulate emission factor (having units matching the units of k),
k = particle size multiplier units of interest (e.g., 0.0022 lb/VMT for PM_{10}),
sL = road surface silt loading (grams per square meter) (g/m2),
W = average weight (tons) of the vehicles traveling the road,

Processing and screening equipment emissions of PM_{10} and $PM_{2.5}$ were calculated using factors provided in Section 11.9.2 of AP-42 and the PM Calculator posted on the US EPA website. Emission factors for controlled sources were used because processing equipment would have water spray bars installed to reduce the particulate emissions.

Slurry Wall

The slurry wall would be installed during the excavation phase of the Project. The slurry wall will decrease the flux of groundwater between the reservoir/excavation pit and surrounding aquifer. Slurry walls are underground walls made of bentonite (clay) mixtures that are installed to inhibit groundwater flow. In this case, the slurry wall would be installed around the reservoir perimeter to decrease groundwater seepage flowing into the reservoir during excavation and construction phases, and to keep the reservoir in a relatively dry condition when not being used for storage. The slurry wall would be installed from elevations above the groundwater levels and extend upwards into the Reservoir's perimeter berm as needed to contain water stored in the Reservoir above groundwater levels and downwards into natural lower permeability material.

The slurry wall will be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. The general sequence of slurry wall construction activities, which were analyzed as part of the Project excavation phase in this report, would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the WCA operations for processing as appropriate.

- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Suitable durable excavated granular material will be used, or more suitable material will be obtained from the WCA operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill material displaces the bentonite slurry in the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400 feet and its width is typically 3 feet.
- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road.
- A road safety berm will also be constructed along the inside of the road facing the excavation area.
- As the excavation of the reservoir is deepened an access ramp will be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction; however, emissions from source (mobile equipment, dust, etc.) required to construct the slurry wall were incorporated into the analysis of the excavation phase emissions.

2.4.3 CEQA Baseline for Excavation Phase

In the past, mining has occurred on the adjacent Seaborn facility. The excavated materials were hauled by truck to the onsite processing plant during 1997 to 2006, the facility baseline was conservatively estimated at 500,000 tons per year average and 650,000 tons per year maximum. This means that over the course of the 10-year period, the average net tonnage mined was 500,000, whereas the maximum year in this period involved the excavation of 650,000 net tons. Table 10 presents the equipment associated with baseline excavation.

Based of communications with the Seaborn site operators, the baseline number of employees was 7 to 12 and the equipment used was the standard equipment typically used for aggregate excavation and operations. The Project would have either the same or less employees and the same standard aggregate mining equipment would be used as in the baseline. Because the Project site aggregates processing plant would not increase production rate above baseline levels, the number of trips and Vehicle Miles Traveled (VMT) by on-road trucks delivering product to the market would not change from baseline levels and continued operation of these existing sources of air emissions would not be an effect of the Project. For the purposes of this analysis, the baseline emissions are the average annual baseline activity levels.

Baseline for Non-Road Engines

Baseline haul distance from the excavation to the processing plant was assumed to be 0.3 miles. This average trip length is half of the longest haul path on the Seaborn site. Loader, excavator and haul truck activity levels were based on haul distance and cycle time analysis (Appendix C). The skid steer, telehandler, de-watering

pumps, and water trucks were assumed to have fixed operational hours. Baseline equipment activity is summarized in Table 10.

Table 10 Baseline Equipment and Activity for Excavation

Equipment	HP	Annual Operating Hours	Max Daily Operating Hours
988 Loader	540	502	14
982 Loader	400	502	14
980 Loader	390	502	14
390 Excavator	530	511	14
Two Haul Trucks	600	1044	14
Skid Steer	65	626	2
Telehandler/Aerial Lift	402	626	2
Water Truck	402	2503	14
Recycle Generator Set	1015	148	14

Source: Appendix C.

Excavation equipment emission factors in the baseline were obtained from the CalEEMod Appendix D Table 3.4: Off-road Emissions Factors for the year 2005. Average annual emissions in the baseline are summarized in Table 11.

Table 11 Excavation Exhaust Emissions During the Baseline Period

Period	Units	ROG	CO	NO_X	SO_2	PM_{10} (diesel)	$PM_{2.5}$ (diesel)
Annual	Tons	1.7	6.1	17.5	0.13	0.67	0.67
Max Daily	lbs	43.7	163.1	457.1	3.24	16.63	16.63
Max Hourly	lbs	3.2	12.0	33.3	0.24	1.24	1.24

Source: Appendix C.

Baseline for On-Road Engines

The Production rate or the amount of material produced by the Project would remain unchanged from the baseline level. Thus, off-site haul trucks and associated emissions would not be increased above baseline.

In general, diesel engine emissions from all modes of operation decrease in the future due to phase-in of CARB engine regulations. This primarily affects cancer risk, which is a multi-year impact.

Baseline Emissions Summary

Table 12 presents baseline emissions for each emissions source associated with the baseline activity. Sources are broken out into two categories, Stationary Sources and Permit Exempt sources. PM_{10} and $PM_{2.5}$ emissions in Table 12 include both fugitive emissions and engine exhaust emissions.

Table 12 Baseline Annual Emissions Summary

Baseline Emissions (tons/yr)							
		ROG	**CO**	**NO_X**	**SO_2**	**PM_{10} Total**	**$PM_{2.5}$ Total**
Stationary Sources	Recycle Plant Fugitive Ems.					0.12	0.03
	Recycle Engine	0.12	0.45	1.26	0.0084	0.04	0.04
	Aggregates Plant Fugitive Ems.					0.03	0.01
	Aggregates Storage					0.38	0.11
Permit Exempt Sources	Excavation Fugitive Ems.					7.5	2.2
	Excavation Offroad Engines	0.86	3.21	8.74	0.06	0.34	0.34
	Aggregates Transfer/Drops					0.62	0.18
	Off-Road Vehicle Haul	0.72	2.48	7.49	0.055	5.6	1.4
	Total Emissions	**1.7**	**6.1**	**17.5**	**0.1**	**14.6**	**4.3**

Source: Appendix C.

2.4.4 Project Construction Phase Emissions

The construction phase of the Project would begin prior to excavation with installation of site security features. The remainder of reservoir features would be constructed approximately 15 to 23 years after the excavation begins.

- Site security features and on-site construction office (prefabricated trailer) including an access gate and perimeter road.
- Inflow channel consisting of a weir, chute, and dissipation pool and Outflow Channel consisting of a weir each requires an excavator, backhoe, water truck, loader, compactor, cement trucks, cement pumps, and cranes.
- Generator building and floating barge pump, including an aboveground diesel tank, would require an excavator, water truck, backhoe, compactor, trencher and cement trucks.

Combustion emission sources at the reservoir during construction consist of off-road mobile and portable diesel fueled equipment. The off-road equipment emissions were calculated using emissions factors in Appendix D of the CalEEMod User's Guide.

2.4.4.1 Site Security Features and On-site Office

Zero emissions are assessed for installation of site security fence and the on-site office (which is assumed to be prefabricated) because emissions from these activities are negligible.

2.4.4.2 Inflow and Outflow Channels

The engineering design of the reservoir was prepared by Provost & Pritchard Consulting Group (P&P). The following design information was obtained from P&P.

The inflow and outflow structures would require excavation and grading to prepare the sites for form installation. These structures are assumed to be constructed using the average units in the 2025 off-road fleet. Inflow/outflow grading consists of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards, and the placement of approximately 9,000 cubic yards of rip-rap. Excavated soils are assumed to be spread onsite. Table 13 lists the approximate equipment activity levels for grading of the in/out flow channels.

Table 13 In/Out-Flow Grading

Description	Equipment	HP	Rate	Quantity	# of 8-hour Days
Clear and Grub, Haul Roads	Dozer	165	1 hr/ac	3 ac	1
Canal Excavation and Spreading	Tractor	530	15 cy/load	20,000 cy @ 3 loads/hr	56
Final Shaping of Canal	Grader	200	0.5 hr/ac	3 ac	1
Placing of Rip-Rap	Excavator	184	1 cy/bucket	9,000 cy @ 20 buckets/hr	56
Hauling of Rip-Rap	Dump Truck	300	10 cy/Haul	9,000 cy @ 4 hauls/hr	28
Dust Control	Water Truck	230	2 hr/day	56 days	14

Source: Provost & Pritchard Consulting Group, 3/18/2015 (Appendix B).

Construction of the in/out-flow building would consist of finish grading and minor excavation of approximately 600 cubic yards and the placement of approximately 1,100 cubic yards of concrete. Excavated soils are assumed to be spread onsite. Table 14 lists the approximate equipment activity levels for construction.

Table 14 In/Out-Flow Building

Description	Equipment	HP	Rate	Quantity	# of 8 Hour Days
Minor Excavation, Structural Compaction	Excavator	184	1 cy/bucket	500 cy @ 20 buckets/hr	3
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hr	100 cy	3
Concrete Placement (Pump)	Generator	84	20 cy/hr	1,100 cy	7
Placing of Box Culvert	Crane	250	N/A	N/A	10

Source: Provost & Pritchard Consulting Group, 3/18/2015 (Appendix B).

2.4.4.3 Generator Building and Floating Barge Pump

Construction of the generator/barge pump would consist of finish grading and minor excavation as well as excavation and placement of the barge pump discharge pipes. Table 15 lists the approximate equipment activity levels for construction of the generator/barge pump.

Table 15 Generator/Barge Pump

Description	Equipment	HP	Rate	Quantity	# of 8 Hour Days
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hr	50 cy	2
Pipe Trench Excavation, Backfill, and Compaction	Excavator	184	200 ft/ 8 hr	1200 ft	6
Concrete Placement (Pump)	Diesel Generator	84	N/A	N/A	1
Dust Control, Soil Conditioning	Water Truck	230	1 hr/day	8 days	1

Source: Provost & Pritchard Consulting Group, 3/18/2015 (Appendix B).

2.4.4.4 Construction Phase Emissions Summary

Construction emissions were determined using CalEEMod version 2016.3.2. In order to account for various potential construction timelines, construction activities were assumed to take place within the same year. This assumption is conservative, as the Project is likely to spread out construction activities, reducing annual emissions from the estimate made in this analysis. Table 16 presents emissions from the construction phase of the Project.

Table 16 Project Construction Emissions

Activity	ROG (tpy)	CO (tpy)	NO_X (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Project Construction	0.048	0.29	0.49	0.001	0.022	0.018

Source: Appendix D.

2.4.5 Excavation Phase Emissions

For the purposes of this analysis, excavation was assumed to occur for approximately 23 years, and the maximum annual production rate (920,000 tons gross, 650,000 tons net) was assumed to occur in the first year of the Project. Slurry wall installation is also assumed to take place at the beginning of the excavation phase, and is expected to take 1 year. By modeling the maximum year and slurry wall installation in the first year of the excavation phase, the model is conservative, as modeled receptors are assumed to be infants and more sensitive to emissions. The average year (720,000 tons gross, 500,000 tons net) was modeled for every year after the first year.

2.4.5.1 Slurry Wall

The slurry wall will be designed by a qualified professional and installed by a qualified contractor. Slurry wall installation includes the following activities:

- Creation of a perimeter access road that would also serve as a leveling surface for the construction of the slurry wall.
- Creation of an approximately 60- to 80-foot-deep slurry wall surrounding the excavation/reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow.
- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate reservoir area.

It is anticipated construction would take approximately 6 months and would include the following on-site facilities. After completion of the slurry wall these facilities would be demobilized from the site:

- Vehicle and equipment parking areas.
- A fill material stockpile area.
- Equipment storage area.
- A bentonite slurry mixing pond (see further discussion below on the slurry wall construction activities).
- A slurry wall backfill mixing area that would be moved along with the construction of the slurry wall so it is always adjacent to the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the WCA operations for processing as appropriate.
- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Suitable excavated granular material will be used, or more suitable material will be obtained from the WCA operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill materials displaces the bentonite slurry

in the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400 feet and its width is typically 3 feet.

- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road.
- A road safety berm will also be constructed along the inside of the road facing the excavation area.
- As the excavation of the reservoir pit is deepened an access ramp will be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

In summary, slurry wall installation consists of clearing and grubbing approximately 26 acres, excavating approximately 112,000 cubic yards of native soil, and pouring of the slurry wall into the excavated trench. For the purposes of this analysis, soil excavated and transported for the slurry wall construction would be considered part of the total excavated material, such that the average site tonnage excavated (including slurry wall excavation) does not exceed baseline levels in the max year. Slurry wall materials imported to the site would substitute for exported material such that haul truck activity on-site and off-site would also not increase above baseline levels. Table 17 lists the approximate equipment activity levels for construction.

Table 17 Slurry Wall Excavation and Installation

Description	Equipment	HP	Rate	Quantity	# of 8 Hour Days
Clear/Grub, Haul Road, Construction Ponds	Dozer	165	1 hr/ac	26 ac	4
Slurry Wall Excavation	Excavator	429	1.7 cy/bucket	109,000 cy @ 25 buckets/hr	321
Haul Excavated Soil to Mixing Site and Return with Slurry Mix	Dump Truck	300	10 cy/haul	119,000 cy @ 4 hauls/hour	372
Plug Mill for Sieving Native Soils	Generator	100	4 hr/day	401 days	201
Mixing and Moving Slurry Mix	Loader	349	3 cy/bucket	119,000 cy @ 20 buckets/hr	248
Construction Slurry Pump	Generator	84	N/A	N/A	321
Dust Control	Water Truck	230	2 hr/day	401 days	100
Material Imports	On-Road Trucks	n/a	14 trips/day at 14.7 VMT/trip	60,000 tons in 4,800 trips	372

Source: Provost & Pritchard Consulting Group, 9/15/2014 (Appendix B).

2.4.5.2 Excavation Activity

Excavation activity would be limited to historical levels in the baseline. Accordingly, dust emissions related to excavation would not increase. However, the excavation emissions would change locations from the Seaborn site to the Project site which is immediately adjacent to the Seaborn site. The HRA included this change in location.

Excavation Phase Non-Road Engines

Table 18 presents the size, type and hours of operation for equipment that would be involved in excavating the reservoir.

Table 18 Excavation Equipment

Equipment	HP	Operating Hours per Year	Max Daily Operating Hours
988 Loader	540	502	14
982 Loader	400	502	14
980 Loader	390	502	14
390 Excavator	530	511	14
Haul Truck	600	1044	14
Haul Truck	600	1044	14
Dewatering Pump	30	3754	12
Dewatering Pump	30	3754	12
Skid Steer	65	626	2
Telehandler/Aerial Lift	402	626	2
Water Truck	402	2503	14

Source: Appendix B.

Annual hours of operation for the loaders, excavator, and haul trucks were determined based upon cycle time analysis using methods in the Caterpillar Performance Handbook (Appendix C).

The skid steer, telehandler, water trucks and dewatering pumps were assumed to have fixed operational hours. Up to two portable pumps, with 30 hp diesel engines, would be used to dewater the excavations. The pumps would operate continuously to keep the excavation dry.

Excavation Phase On-Road Engines

The amount of material produced by the Project would remain unchanged from the baseline level. Thus, off-site travel activity levels and associated emissions would be unaffected by the Project. Emissions from engines in trucks traveling on-site to export and import materials were calculated and incorporated into the HRA.

The number of employees would be either be less or remain unchanged from baseline condition with the Project. In general, diesel engine emissions from all modes of operation decrease in the future due to phase-in of CARB engine regulations. This primarily affects cancer risk which is a multi-year impact.

Excavation Phase Aggregates Processing Plant

The aggregates processing plant emission rate were calculated for both the aggregate screen/wash plant and crush/recycle plant (Appendix C). The screen/wash plant consists mostly of wet screening and material handling, and therefore only has fugitive emissions associated with dry feed materials. The wash/screen plant is run on grid electricity. The crush/recycle plant would be run using a portable diesel generator, and the associated fugitive and engine emissions were calculated for incorporation in the HRA (Appendix C).

Excavation Phase Stockpile/Loadout Area

The stockpile area would not increase from baseline levels with the Project. Emissions from a stockpile area two acres in size was attributed to the stockpile area at the Seaborn site in the baseline and for the Project. Emissions were calculated using the emissions factor and control efficiency recommended in Stationary Source Policy 1610 (SJVAPCD, 2013).

Excavation Phase Travel on Roads

Emissions from travel on roads depend upon the number of trips, length of the road, weight and speed of the vehicle and road surface condition.

Road lengths in the baseline at the Seaborn site were determined based on aerial photography on Google Earth taken during the baseline period. Half of the longest haul path was chosen as a representative road length in the baseline. Similarly, half of the longest haul path on the McKay site was chosen as the average haul trip for the purposes of this analysis.

Excavation Phase Emissions Summary

For emissions calculations, the Project is assumed to operate within the annual maximum production rate of 650,000 tons/yr for the first year, and then the average production rate 500,000 tons/yr for the following 22 years. Although the length of the excavation phase would be between 15 to 23 years, the actual length of this phase of the Project is dependent on the amount of high-quality aggregate is located in the pit area and the market demand. For the emission calculations it was assumed that it would take 23 years for the excavation of the pit for the reservoir to be completed. Assuming 30 percent waste factor, the maximum amount of material that would be excavated is approximately 920,000 gross tons/yr. In order to conservatively model air quality impact, the maximum excavation rate is assessed in the first year, concurrently with the installation of the slurry wall. Slurry wall installation emissions and Project excavation maximum annual emissions are shown in Table 19 and Table 20 respectively.

Table 19 Slurry Wall Installation Emissions Summary

Tons/Year					
ROG	**CO**	**NO_X**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
0.34	2.34	3.26	0.01	0.28	0.17

Source: Appendix C.

Table 20 Excavation Phase Emissions Summary

Project Emissions (tons/yr)							
		ROG	**CO**	**NO_X**	**SO_2**	**PM_{10} Total**	**$PM_{2.5}$ Total**
Stationary Sources	Crush/Recycle Plant Fugitive Ems.					0.12	0.03
	Recycle Engine	0.040	0.18	0.60	0.00083	0.01	0.01
	Wash/ Screen Plant Fugitive Ems.					0.03	0.01
	Aggregates Storage					0.38	0.11
Permit Exempt Sources	Excavation Fugitive Ems.					9.8	2.8
	Excavation Offroad Engines	0.34	2.09	3.30	0.0074	0.1	0.1
	Aggregates Transfer/Drops					0.8	3.1
	Off-Road Vehicle Haul	0.40	2.67	3.68	0.0069	17.4	3.8
	De-watering Pumps	0.14	0.77	0.76	0.0013	0.0	0.0
	On-Road Vehicle Haul	0.00090	0.010	0.14	0.00082	0.1	0.0
Total Project (Future) Emissions		**0.9**	**5.7**	**8.5**	**0.02**	**28.7**	**10.1**
Baseline Emissions		**1.7**	**6.1**	**17.5**	**0.1**	**14.6**	**4.3**
Project Emissions (net increase or decrease from baseline emissions)		**-0.8**	**-0.4**	**-9.0**	**-0.1**	**14.1**	**5.7**

Source: Appendix C.

2.4.6 Operation Phase Emissions

The following assumes that on average the proposed basin could be filled two times per year for a total usable yearly volume of 9,100 acres-feet. Approximately 3,580 acres-feet can flow by gravity into the St. Johns River and the remaining 5,520 acres-feet can be pumped out at a maximum flow rate of 160 cubic feet per second. Table 21 lists the approximate equipment activity levels for operations. Table 22 lists the resulting emissions totals from Project operation.

Table 21 Project Operations

Non-Road Sources	**Equipment**	**HP**	**Rate**	**Quantity**	**# of 8 Hour Days**
Pumping	Generator	600	160 cfs	7,700 ac-ft	73
Minor Site Maintenance	Backhoe	108	N/A	N/A	20
On-Road Sources	**Equipment**	**Vehicle Miles Traveled / Year**			
Support Trucks	Spray Truck	380			
Support Trucks	Pickup	2,080			
Support Trucks	Fuel Truck	450			

Source: Provost & Pritchard Consulting Group, 3/18/2015 (Appendix B).

Table 22 Project Operation Emissions

Activity	ROG (tpy)	CO (tpy)	NOX (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)
Generators	0.031	0.28	0.09	0.0014	0.0031	0.0031
Backhoe	0.007	0.10	0.04	0.0002	0.0006	0.0006
Support vehicles	0.004	0.02	0.01	0.0001	0.0002	0.0002
Total	**0.042**	**0.40**	**0.15**	**0.0017**	**0.0039**	**0.0039**

Source: Appendix C.

2.4.7 Health Risk Assessment

A HRA was performed using current best practices including methods from the HRA Guidelines (OEHHA, 2015). The four steps involved in the risk assessment process are: 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization. These four steps were used to assess health risk for the Project and each is discussed in the sections below.

Hazard Identification and Quantification

For air toxics sources, hazard identification involves the pollutant(s) of concern emitted by a facility, and the types of adverse health effects associated with exposure to the chemical(s), including whether a pollutant is a potential human carcinogen or is associated with other types of adverse health effects. Appendix A of the HRA Guidelines includes a list of TACs that are used for HRA in California.

DPM is the primary toxic constituent emitted by mining projects. DPM has an assigned cancer potency factor (CPF) and a non-cancer reference exposure level (REL) that are used to evaluate the risk from the DPM concentration present.

Fugitive emissions were generally speciated into constituent TACs based on SJVAPCD speciation profiles. San Diego Air Pollution Control District (SDAPCD) speciation profiles were also used when speciation data was not available from SJVACPD. The resulting mass of each TAC was used as input along with the dispersion coefficients to predict the ground level concentration (GLC) of each TAC which could then be used to evaluate the dose received by each receptor along each exposure pathway and, in the case of non-cancer risk, on each target organ, which was performed using HARP2 as discussed in the following subsections.

TACs incorporated in the HRA can be found in Table 23. Specific speciation profiles for road-based emissions, aggregates processing emissions, storage emissions, and excavation emissions can be found in Appendix C. Diesel emissions were evaluated for diesel particulate matter.

Table 23 Toxic Air Contaminants Incorporated in HRA

CAS	Chemical Name
7429905	Aluminum
7440382	Arsenic

CAS	Chemical Name
7440393	Barium
7440417	Beryllium
7440439	Cadmium
18540299	Hexavalent Chromium
7440473	Chromium
7440484	Cobalt
7440508	Copper
7439921	Lead
7439965	Manganese
7440020	Nickel
7782492	Selenium
1175	Silica, Crystalline
7440666	Zinc

Source: Appendix C

The HRA considered whether health risk from asbestos should be quantified. It was determined based on review of available maps (California Department of Conservation, Division of Mines and Geology, 2000) and language in the Asbestos ATCM's (17CCR §93105 and §93106) that allows the APCO to exempt sand and gravel facilities operating in alluvial deposits, that asbestos is unlikely to exist within, or upstream from, the Project site. Therefore, asbestos was excluded from the HRA.

Exposure Assessment

The purpose of exposure assessment is to estimate the extent of public exposure to emitted substances. For the Hot Spots program, in practice this means estimating exposures for those emitted substances for which potential cancer risk or noncancer health hazards for acute, repeated 8-hour, and chronic exposures will be evaluated. This involves emission quantification, modeling of environmental transport, evaluation of environmental fate, identification of exposure routes, identification of exposed populations, and estimation of short-term (e.g., 1-hour maximum), 8-hour average, and long-term (annual) exposure levels.

Hot Spots Analysis and Reporting Program (HARP2) software developed by CARB can be used to model ground level concentrations at specific off-site locations. HARP2 incorporates the US EPA-approved dispersion model, American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). AERMOD is a steady-state plume model based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. CARB recommends AERMOD for Hot Spots risk assessments (OEHHA, 2015).

In this HRA, the air dispersion modeling was performed separately from HARP2 using AERMOD View by Lakes Environmental, Version 10.0.1 running AERMOD executable Version 2112. Output from the Lakes software program were imported to HARP2 (dated 2021) which was then used to perform the risk characterization

portion of the HRA. The process of using air dispersion modeling results as the basis of HRA follows these four steps:

1. Air dispersion modeling is used to estimate annual average and maximum one-hour ground level concentrations (GLC). The air dispersion modeling results are expressed as an air concentration or in terms of (Chi over Q) for each receptor point. (Chi over Q) is the modeled downwind air concentration (Chi) based on an emission rate of one gram per second (Q). (Chi over Q) is expressed in units of micrograms per cubic meter per gram per second, or ($\mu g/m^3$)/(g/s). (Chi over Q) is sometimes written as (X/Q) and is sometimes referred to as the dilution factor.

2. When multiple substances are evaluated, the X/Q is normally utilized since it is based on an emission rate of one gram per second. The X/Q at the receptor point of interest is multiplied by the substance-specific emission rate (in g/s) to yield the substance-specific GLC in units of $\mu g/m^3$. The following equations illustrate this point.

   $$GLC = \left(\frac{X}{Q}\right) \times Q_{Substance}$$

   $$\frac{X}{Q} = (Chi\ over\ Q)\ in\ \left(\frac{{}^{\mu g}/_{m^3}}{{}^{g}/_{s}}\right), from\ model\ results\ with\ unit\ emission\ rate$$

   $$Q_{Substance} = substance\ emission\ rate\ \left({}^{g}/_{s}\right)$$

3. The applicable exposure pathways (e.g., inhalation, soil contact, fish consumption) are identified for the emitted substances, and the receptor locations are identified. This determines which exposure algorithms are ultimately used to estimate dose. After the exposure pathways are identified, the fate and transport algorithms are used to estimate concentrations in the applicable exposure media (e.g., soil or water) and the exposure algorithms are used to determine the substance-specific dose.

4. The dose is used with cancer and noncancer health values to calculate the potential health impacts for the receptor. An example calculation using the high-end point-estimates for the inhalation (breathing) exposure pathway can be found in Appendix I of the HRA Guidelines (OEHHA, 2015).

AERMOD was used as described above to calculate a X/Q for each source-receptor combination by setting the emission rate for each source in the model to one gram per second (1 g/s). Other parameters used in AERMOD describe overall control of the model domain and functionality (e.g., coordinate system, terrain, non-default options, etc.), receptors (e.g., location, height), sources (e.g., size, location, exhaust velocity, temperature, operating schedule), meteorology (files provided by SJVAPCD), and output file options.

The Control Pathway of AERMOD was set to provide output in units of concentration; and both wet and dry plume depletion were disabled. The non-regulatory default option of flat terrain was selected as well as the beta option “Adjusted Friction Velocity (u*) in AERMET (ADJ_U*)” as discussed above. Pollutant/averaging

options were set to PM_{10} with averaging times of 1-hour and the period of the meteorological data file (i.e., five years). The rural dispersion coefficient was used and exponential decay was excluded.

Receptors were modeled at a flagpole height of 1.5 m. Fourteen (14) discrete receptors, 441 grid receptors, and 179 plant boundary receptors were modeled for a total of 634 receptors. The discrete receptors are shown on Figure 7 (Appendix A) and Table 24. The receptor grid was used to make the contoured plots of health risk shown in Figure 7 Appendix A.

Sources that existed during the baseline period and those proposed by the Project are illustrated on Figure 6a and 6b (Appendix A) and source parameters are summarized in Table 25. Project and baseline sources were included in the model. Project sources were assigned positive emissions values and baseline sources were assigned negative values so that the HRA result represent the change in health risk with the Project.

A wind rose showing the frequency of direction and speed of wind at the Visalia Airport (2007 through 2010) was produced from wind data obtained from the SJVAPCD website (Figure 5, Appendix A). The U-star adjusted (ADJ_U*) wind data file was chosen from the SJVAPCD website for the Project because it is a mining project and similar to the project discussed in the EPA Memo on this topic (EPA, 2016). Visalia Airport (Station No. 93144) is about 19 miles west-southwest of the Project.

Output of the dispersion model in the form of plotfiles, one for each combination of source and averaging period, that contain X/Q values were then used in HARP2 with the emissions rates presented above and other human exposure parameters discussed below to predict the acute, non-cancer chronic, and cancer risk at each receptor. The modeling files are provided in Appendix F.

Table 24 Discrete Receptors

Figure ID Number	Model ID Number	UTM Coordinates	Description
1	396	314147m E, 4029689m N	Residence
2	397	314961m E, 4030517m N	Residence
3	398	315839m E, 4030375m N	Residence
4	399	316657m E, 4030352m N	Residence
5	400	317361m E, 4030179m N	Residence
6	401	318513m E, 4029741m N	Residence
7	402	318199m E, 4028391m N	Residence
8	403	317302m E, 4027693m N	Sequoia Union Elementary School
9	404	316265m E, 4028364m N	Residence
10	405	316611m E, 4028986m N	Residence (owned by TID)
11	406	314180m E, 4029952m N	Residence
12	407	314516m E, 4030398m N	Residence
13	408	314946m E, 4028025m N	Residence
14	409	317360m E, 4029626m N	Cemex Facility Worker

Note: Project is in UTM Zone 11N.

Once emissions exit the source, the substances emitted will be dispersed in the air. The emission plume may contain both vapor phase substances and particulates. A semivolatile organic toxicant can partition into both vapor and particulate phases. Particulates can deposit on vegetation, on soil, and in water at a rate that is dependent on the particle size. A deposition rate of 0.05 m/s is conservative and was used for the Project HRA. The following algorithms are used to estimate concentrations in environmental media including air, soil, water, vegetation, and animal products.

Table 25 Emissions Source Parameters for Baseline and Project

AERMOD ID	Description	Src Grp ID	Type	UTM	Size [a]	Other Parameters
BMINE	Baseline excavation area	1	Area Poly	314323.56 m E, 4030149.56 m N	365,208 m^2	Release Height = 0m Initial Vertical Dim. = 1.39m
BONHL	Baseline onsite off-road truck haul	2	Line Volume	315088.27 m E, 4029989.87 m N	500 m	Plume Height: 5.1 Plume Width: 9.0
BPILE	Baseline storage area	3	Area	315105.22 m E, 4029954.44 m N	10,000 m^2	Release Height = 0m Initial Vertical Dim. = 1.39m
BPLTGN	Baseline crush/recycle plant generator	4	Point	315263.12 m E, 4030032.93 m N	Dia. = 0.254m	Temp. = 787K (fixed) Flow = 6,420 cfm Vert. Release
BSBPLT	Baseline rock processing plant	5	Volume	315261.87 m E, 4030006.07 m N	10,000 m^2	Release Height = 4.15 m Initial Vertical Dim. = 0.97 m
DEWTR	Dewatering pumps	6	Volume	317096.15 m E, 4029547.27 m N	25 m^2	Release Height = 2.0 m Initial Vertical Dim. = 0.23 m
EXCAV	Mckay site excavation	7	Area	316585.08 m E, 4029236.65 m N	10,000 m^2	Release Height = 0m Initial Vertical Dim. = 1.39m
MONHL	Mckay On-site Offroad truck haul	8	Line Volume	315967.80 m E, 4029538.88 m N	965 m	Plume Height: 5.1 Plume Width: 9.0
MPILE	Mckay Storage area	9	Area	316557.63 m E, 4029339.53 m N	10,000 m^2	Release Height = 0m Initial Vertical Dim. = 1.39m
MPIT	Mckay pit area, transfer/drop ems.	10	Area Poly	317356.16m E, 4029590.54 m N	323,440 m^2	Release Height = 0m Initial Vertical Dim. = 1.39m
MPLNT	Mckay rock processing plant	11	Volume	316606.45 m E, 4029489.68 m N	10,000 m^2	Release Height = 4.15m, Init. Dim.= 0.97
MPLTGN	Mckay crush plant generator	12	Point	316577.86 m E, 4029518.19 m N	Dia. = 0.254m	Temp. = 787K (fixed) Flow = 6,420 cfm Vert. Release
MXHL	Mckay on-site on-road truck haul	13	Line Volume	315402.13 m E, 4029648.33 m N	2,576.6 m	Plume Height: 5.1 Plume Width: 9.0
RESGEN	Generator, reservoir pump	14	Point	316667.00 m E, 4029190.00 m N	Dia. = 0.254m	Temp. = 787K (fixed) Flow = 6,420 cfm Vert. Release

[a] Flat terrain was used so each source has base elevation of zero meters.

[b] Haul road parameters by EPA methods (EPA, 2012).

[c] Initial dimensions by EPA methods (EPA, 1995).

Determination of the concentration in air is made using X/Q and the emissions rate (g/s) as discussed above. The concentration of the substance in soil (Cs) is a function of the deposition, accumulation period, chemical specific soil half-life, mixing depth, and soil bulk density. For simplicity and health protection, the Tier 1 default

assumes 70-year soil deposition for the accumulation period at end of 70-year facility lifetime. The water pathway is evaluated as if a standing water body (e.g., pond or lake) is impacted by facility emissions and is used as a source for drinking water by food-producing animals or humans, or is a source of angler-caught fish. The average concentration of the substance in water (Cw) is a function of direct deposition (material carried in by surface run-off may occur as well but is not modeled). Concentrations in vegetation, animal products, angler caught fish, and mother's milk are predicated on the concentrations estimate to be in the air, water, and soil. The Project HRA includes air, soil ingestion, home grown produce, and mother's milk as pathways of exposure. Detailed discussion of the methodologies used to determine the concentrations in various media to which receptors may be exposed is located in Subchapter 5.3 of the HRA Guidelines.

Once the concentrations of substances are estimated in air, soil, water, plants, and animal products, they are used to evaluate estimated exposure to people. Exposure is evaluated by calculating the daily dose in milligrams per kilogram body weight per day (mg/kg/d). The HRA Guidelines describe the algorithms used by HARP2 to calculate this dose for exposure through inhalation, dermal absorption, and ingestion pathways. All chemicals are assessed for exposure through inhalation. Emissions of semi-or non-volatile multi-pathway substances (e.g., earth metals in fugitive dust), the soil ingestion pathway and the dermal soil exposure pathway are also assessed. The mother's milk pathway is used depending on the multi-pathway substance released. The Project HRA assessed each of these pathways.

Inhalation Dose

The dose through the inhalation route is estimated for cancer risk assessment and noncancer hazard assessment. Both residential and offsite worker exposures are considered. Since residential exposure includes near-continuous long-term exposure at a residence and workers are exposed only during working hours (i.e., 8 hours/day), different breathing rate distributions are used.

Exposure through inhalation is a function of the breathing rate, the exposure frequency, and the concentration of a substance in the air. For residential exposure, the breathing rates are determined for specific age groups, so inhalation dose (Dose-air) is calculated for each of these age groups, 3rd trimester, 0<2, 2<9, 2<16, 16<30 and 16-70 years. OEHHA used the mother's breathing rates to estimate dose for the 3rd trimester fetus assuming the dose to the fetus during the 3rd trimester is the same as the mother's dose. These age-specific groupings are needed in order to properly use the age sensitivity factors for cancer risk assessment. Tier 1 evaluations and the Project HRA use the high-end point estimate (i.e., the 95th percentiles) breathing rates for the inhalation pathway in order to avoid underestimating cancer risk to the public, including children. The following equation is used to determine dose for the inhalation pathway.

$$Dose_{Air} = C_{Air} \times \left\{\frac{BR}{BW}\right\} \times A \times EF \times 10^{-6}$$

Where:

$Dose_{Air}$ = Dose through inhalation (mg/kg/d)

C_{Air} = Concentration in air (µg/m^3)

{BR/BW} = Daily breathing rate normalized to body weight (L/kg body weight-day)

A = Inhalation absorption factor (unitless)
EF = Exposure frequency (unitless), days/365 days
10^{-6} = Micrograms to milligrams conversion, liters to cubic meters conversion

As discussed above, recommended values for the breathing rate normalized to body weight term, {BR/BW}, are the 95th percentile high-end point estimate that is used for Tier 1 HRAs like the Project HRA. This term has several values that are needed to assess cancer risk for each age bins designated in the HRA Guidelines (i.e., third trimester, 0 to 2, 2 to 16 and 16 to 70 years). These values as well as parametric model distributions used for Tier 3 and Tier 4 stochastic analysis are provided in the HRA Guidelines. The inhalation absorption factor, A, is recommended to be assigned a value of one (i.e., 100% of dose is absorbed) but may also be assigned the value determined by the toxicological study upon which the REL for the substance is based. Exposure frequency is recommended to be 350 days for residential exposures. Table 26 presents the mean and high-end point estimates for residential intake rates that were assumed in the Project HRA.

For worker exposure, the HARP2 default assumes working age begins at 16 years, and that exposures to facility emissions occur during the work shift, typically up to 8 hours per day during work days. Breathing rates that occur over an 8-hour period vary depending on the intensity of the activity, and are used to estimate the inhalation dose. The 8-hour breathing rates may also be used for cancer risk assessment of children and teachers exposed at schools during school hours. The Project HRA used a more conservative approach and instead applied residential exposure characteristics at the nearby school, Sequoia Union Elementary School.

Table 26 Point Estimates of Residential Daily Breathing Rates by Age Group

Estimate	3rd Trimester[1] (L/kg BW-day)[2]	0<2 Years (L/kg BW-day)	2<16 Years (L/kg BW-day)	16<30 Years (L/kg BW-day)
Mean (65%ile)[3]	225	658	452	210
High-End (95%ile)	361	1090	745	335

Source: (OEHHA, 2015, pp. 5-25).

1 3rd trimester breathing rates based on breathing rate of pregnant women using the assumption that the dose to the fetus during the 3rd trimester is the same as that to the mother.

2 Values are in units of liters of air per kilogram of body weight per day.

3 Mean values were not used in the HRA and are provided for informational purposes only.

Exposed workers may be engaged in activities ranging from desk work, which would reflect breathing rates of sedentary/passive or light activities, to farm worker activities, which would reflect breathing rates of moderate intensity. OEHHA recommends default (Tier 1) point estimate 8-hour breathing rates in L/kg-8-hrs based on the mean and 95th percentile of moderate intensity activities, 170 and 230 L/kg-8-hrs, respectively, for adults 16-70 years old.

Non-cancer health risks were determined in HARP2 by dividing the GLC of each pollutant at each receptor by the corresponding reference exposure level (REL, units of µg/m^3) resulting a hazard index (HI). The HIs for pollutants affecting each target organ were then summed to determine the total HI for each target organ. The target organ with the greatest HI is reported as the non-cancer health risk at each receptor. Worker chronic non-cancer health risk results were multiplied by a Worker Adjustment Factor (WAF) of 4.2 which represents

the amount overlap between the Project operating schedule and the worker's work schedule; both of which are assumed to be 8 hr/day, 5 days/wk. The mean and high-end intake rates for workers were 170 and 230 liters per kilogram per 8-hours (L/kg-8-hrs). Workers were assumed to be exposed for 25 years as recommended in the HRA Guidelines (OEHHA, 2015, pp. 5-26).

Annual residential dose was calculated by HARP2 using the GLC (mg/m^3), the intake rate (L/kg-day), 350 days/yr exposure frequency, and an assumption that the entire mass of pollutants inhaled is absorbed into the body of the individual exposed (i.e., no pollutants are exhaled). A fraction of time at home (FAH) of 85% was applied for individuals of any age. Annual worker dose was calculated the same way and adjusted to 250 days/yr exposure frequency by multiplying the result by 0.68.

Inhalation dose of each pollutant at each receptor for each year was then multiplied in HARP2 by the inhalation cancer slope factor for the pollutant to estimate annual cancer risk in units of excess cancer cases per million individuals exposed. The total cancer risk from inhalation was then calculated by summing the annual risk from each pollutant and year of exposure. Residential cancer risk assumed exposure duration of 30 years as recommended by OEHHA (OEHHA, 2015, pp. 8-1) and the OEHHA Derived Method intake rate for all exposure pathways and all ages which is more conservative than the recommended Risk Management Policy (RMP) (95/80%ile combination for inhalation pathway and 65%ile for other pathways), and RMP Derived Method (95/80%ile combination for two dominant exposure pathways and 65%ile for other pathways). The RMP 95/80%ile combination refers to applying the 95^{th} percentile intake rate for ages less than two years and the 80^{th} percentile intake rate for ages over two years whereas the OEHHA Derived Method uses 95%ile intake rate for all ages and results in greater risk estimates which is conservative.

Ingestion Pathway

The average concentration of pollutants in soil is a function of the deposition, accumulation period, chemical specific half-life, mixing depth, and soil bulk density. For simplicity and health protection, the HARP2 default 70-year soil deposition for the accumulation period was assumed. As discussed above, the conservative deposition rate (0.05 m/s) was applied. Equations and parameters used to estimate the concentration of pollutant in the soil from the GLC can be found in the HRA Guidelines (p. 5-6 to 5-8).

The exposure dose through residential soil ingestion varies by age and was calculated for each age group. The dose is calculated by HARP2 based on the concentration in soil, pollutant specific gastrointestinal relative absorption fraction (GRAF, unitless), soil ingestion rate (mg/kg-day), and exposure frequency using the equation presented in the HRA Guidelines (p. 5-43). For simplicity, GRAF was assigned a value of one which represents the entire mass of pollutant being absorbed. Soil ingestion rates vary by age and the high-end point estimates shown in Table 27 were used.

Table 27 Soil Ingestion Rate Point Estimates by Age Group

Estimate	3rd Trimester[1] (mg/kg BW-yr)[2]	0<2 Years (mg/kg BW-yr)	2<16 Years (mg/kg BW-yr)	16<30 Years (mg/kg BW-yr)
Mean (65%ile)[3]	0.7	20	3	0.7
High-End (95%ile)	3	40	10	3

Source: (OEHHA, 2015, pp. 5-44).

1 3rd trimester is assumed to be the mother's soil ingestion rate.

2 Values are in units of milligrams of pollutant ingested per kilogram of body weight per year.

3 Geometric mean (GM) values were not used in the HRA and are provided for informational purposes only.

Dermal Pathway

Exposure through dermal absorption (dose-dermal) is a function of the soil or dust loading of the exposed skin surface, the amount of skin surface area exposed, and the concentration and availability of the pollutant. The annual dermal load (ADL) is a composite of the body surface area per kg body weight, exposure frequency, and soil adherence to the skin. High-end point estimates of ADL for individuals located in a mixed climate were used.

Table 28 Annual Dermal Loading Point Estimates by Age Group

Estimate	3rd Trimester[1] (mg/kg BW-yr)[2]	0<2 Years (mg/kg BW-yr)	2<16 Years (mg/kg BW-yr)	16<30 Years (mg/kg BW-yr)
Mean (65%ile)[3]	1,100	2,200	5,700	1,100
High-End (95%ile)	2,400	2,900	8,100	2,400

Source: (OEHHA, 2015, pp. 5-37).

1 3rd trimester based on ADL of mother normalized to body weight assuming exposure to the mother and feus are the same.

2 Values are in units of milligrams of pollutant on skin per kilogram of body weight per year.

3 Mean values were not used in the HRA and are provided for informational purposes only.

High-end ADL was combined with the concentration of pollutant in soil, the fraction absorbed across skin (pollutant-specific factor), the exposure duration (i.e., 70 years) and the averaging time (i.e., 70-year lifetime) using equations presented in the HRA Guidelines (p. 5-41) to estimate the dermal dose for each residential receptor. Worker receptors used the adult ADL and omitted exposure duration and averaging time from the calculation.

Mother's Milk Pathway

Estimates of the concentration of pollutants in a mother's milk require the use of the air, water, and soil environmental fate evaluations. Infants would be exposed to the pollutants in concentrations equal to the concentrations at which the mother is exposed from birth up to 25 years of age when the infant is born. The exposed infant is assumed to be fully breastfed for the first year of life. The summed average dose daily dose (mg/kg-day) from all pathways is calculated for the nursing mother using equations in the HRA Guidelines (p. 5-59). Breast milk intake rates of 101 and 139 g/kg-day are used by HARP2.

Dose-Response Assessment

Dose-response assessment is the process of characterizing the relationship between exposure to an agent and incidence of an adverse health effect in exposed populations. In quantitative carcinogenic risk assessment, the dose-response relationship is expressed in terms of a potency slope that is used to calculate the probability or risk of cancer associated with an estimated exposure. Cancer potency factors (CPF) are expressed as the 95th percent upper confidence limit of the slope of the dose response curve estimated assuming continuous lifetime exposure to a substance. Typically, potency factors are expressed as units of inverse dose (e.g., (mg/kg BW/day)$^{-1}$) or inverse concentration (e.g., (µg/m3)$^{-1}$). It is assumed in cancer risk assessments that risk is directly proportional to dose and that there is no threshold for carcinogenesis. (OEHHA, 2015).

For noncarcinogenic effects, dose-response data developed from animal or human studies are used to develop acute, 8-hour, and chronic noncancer Reference Exposure Levels (RELs). The acute, 8-hour and chronic RELs are defined as the concentration at which no adverse noncancer health effects are anticipated even in sensitive members of the general population, with infrequent one-hour exposures, repeated 8-hour exposures over a significant fraction of a lifetime, or continuous exposure over a significant fraction of a lifetime, respectively. The most sensitive health effect is chosen to develop the REL if the chemical affects multiple organ systems. Unlike cancer health effects, noncancer health effects are generally assumed to have thresholds for adverse effects. In other words, injury from a pollutant will not occur until exposure to that pollutant has reached or exceeded a certain concentration (i.e., threshold) and/or dose. The acute, 8-hour, and chronic RELs are air concentrations intended to be below the threshold for health effects for the general population (OEHHA, 2015).

The actual threshold for health effects in the general population is generally not known with any precision. Uncertainty factors are applied to the Lowest Observed Adverse Effects Level (LOAEL) or No Observed Adverse Effects Level (NOAEL) or Benchmark Concentration values from animal or human studies to help ensure that the chronic, 8-hour and acute REL values are below the threshold for human health for nearly all individuals. Table 29 summarizes the health values that were used in the dose-response assessment.

Table 29 Health Values for TACs Potentially Emitted by Project

CAS	TAC Name	Inh. Cancer URF (µg/m^3)$^{-1}$	Inh. Cancer Slope Factor (mg/kg-d)$^{-1}$	Oral Cancer Slope Factor (mg/kg-d)$^{-1}$	Acute REL (µg/m^3)	Inh. Chronic REL (µg/m^3)	Inh. Chronic REL 8HR (µg/m^3)	Oral Chronic REL (µg/m^3)
9901	DieselExhPM	3.00E-04	1.10E+00			5.00E+00		
85101	PM_{10}	(No health values for non-TACS like PM_{10} so risk from speciates of PM_{10} was assessed.)						
7440382	Arsenic	3.30E-03	1.20E+01	1.50E+00	2.00E-01	1.50E-02	1.50E-02	3.50E-06
7726956	Bromine							
7440439	Cadmium	4.20E-03	1.50E+01			2.00E-02		5.00E-04
7782505	Chlorine				2.10E+02	2.00E-01		
7440508	Copper				1.00E+02			
7439921	Lead	1.20E-05	4.20E-02	8.50E-03				
7439965	Manganese					9.00E-02	1.70E-01	

CAS	TAC Name	Inh. Cancer URF $(\mu g/m^3)^{-1}$	Inh. Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$	Oral Cancer Slope Factor $(mg/kg\text{-}d)^{-1}$	Acute REL $(\mu g/m^3)$	Inh. Chronic REL $(\mu g/m^3)$	Inh. Chronic REL 8HR $(\mu g/m^3)$	Oral Chronic REL $(\mu g/m^3)$
7439976	Mercury				6.00E-01	3.00E-02	6.00E-02	1.60E-04
7440020	Nickel	2.60E-04	9.10E-01		2.00E-01	1.40E-02	6.00E-02	1.10E-02
7782492	Selenium					2.00E+01		5.00E-03
7440622	Vanadium				3.00E+01			
1175	Silica, Crystln					3.00E+00		

Source: HARP2 output file type PolDB.csv.

Note: Greyed cells contain values that were not used in the HRA. Specifically, DPM was used to assess chronic/cancer risk from exposure to diesel exhaust.

Risk Characterization

Risk characterization is the final step of the HRA. In this step, information developed through the exposure assessment is combined with information from the dose-response assessment to characterize risks to the general public from emissions. In the California, OEHHA conducts the dose-response assessment during the development of cancer potency factors and Reference Exposure Levels. These are used in conjunction with the exposure estimates to estimate cancer risk and evaluate hazard from noncancer toxicity of emitted chemicals. Under AB2588, risk characterizations present both individual and population-wide health risks. A general summary of the risk characterization components includes the following items and information.

- The locations of the point of maximum impact (PMI), the maximum exposed individual receptor (MEIR), and the maximum exposed individual worker (MEIW) are to be identified. The PMI, MEIW, and MEIR for cancer risk and for noncancer hazard indices (averaging times for acute 1-hour, repeated 8-hour, and chronic hazard indices) may not be the same location; all should be identified.
- The location of any specified sensitive receptors (e.g., schools, hospitals, daycare, or eldercare facilities -contact the District or reviewing authority for more information) should be identified.
- Estimates of population-wide cancer risk and noncancer hazard.

Cancer Risk

Cancer risk is calculated by multiplying the daily inhalation or oral dose, by a cancer potency factor, the age sensitivity factor, the frequency of time spent at home (for residents only), and the exposure duration divided by averaging time, to yield the excess cancer risk. As described below, the excess cancer risk is calculated separately for each age grouping and then summed to yield cancer risk at the receptor location. A brief description of the age sensitivity factors, exposure duration, and frequency of time spent at home are included below. These factors are discussed in various technical support documents to the HRA Guidelines.

OEHHA has determined that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA developed age sensitivity factors (ASFs) to take into account the increased sensitivity to carcinogens during early-in-life exposure. In the absence of chemical-specific data, OEHHA recommends a default ASF of 10 for the third trimester to age 2 years, and an ASF of 3 for ages 2 through 15

years to account for potential increased sensitivity to carcinogens during childhood. These values manifest in the intake parameters presented below.

FAH during the day can be used to adjust exposure duration and cancer risk from a specific facility's emissions, based on the assumption that exposures to the facility's emissions are not occurring away from home. From the third trimester to age <2 years, 85% of time is spent at home. From age 2 through <16 years, 72% of time is spent at home. From age 16 years and greater, 73% of time is spent at home. Facilities with a school within the 1×10^{-6} (or greater) isopleth are directed to use FAH = 1 for the child age groups (3rd Trimester, 0<2 years, and 2<16 years).

For residential inhalation exposure, cancer risk must be separately calculated for specified age groups because of age differences in sensitivity to carcinogens and age differences in intake rates (per kg body weight). Separate risk estimates for these age groups provide a health-protective estimate of cancer risk by accounting for greater susceptibility in early life, including both age-related sensitivity and amount of exposure. The following equation illustrates the formula for calculating residential inhalation cancer risk.

$$RISK_{inh-res} = DOSE_{air} \times CPF \times ASF \times \frac{ED}{AT} \times FAH$$

Where:

$RISK_{inh\text{-}res}$ = Residential inhalation cancer risk
$DOSE_{air}$ = Daily inhalation dose (mg/kg-day)
CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for a specified age group (unitless)
ED = Exposure duration (in years) for a specified age group
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Cancer risks calculated for individual age groups are summed to estimate the total cancer risk over the period of interest and/or lifetime. Cancer risk is typically expressed in "chances per million" (cancer risk × 10^6) but may also be expressed in other ways, such as "chances per 100,000" or "chances per 10 million" (cancer risk × 10^7).

For assessment of off-site worker cancer risk at the MEIW, the default assumes working age begins at 16 years. The daily inhalation dose ($DOSE_{air}$) is based on the adjusted 8-hour concentration at the MEIW (for noncontinuous sources) and amount of time the offsite worker's schedule overlaps with the facility's emission schedule. The duration of exposure at the MEIW receptor is 25 years. Additional consideration for offsite worker cancer risk assessment is whether there are women of child bearing age at the MEIW location and whether the MEIW has a daycare center. Under most circumstances, cancer risk accumulated by inhalation is calculated using the following equation:

$$RISK_{inh-work} = DOSE_{air} \times CPF \times ASF \times \frac{ED}{AT}$$

Where:

$RISK_{inh\text{-}work}$ = Worker inhalation cancer risk
$DOSE_{air}$ = Daily inhalation dose (mg/kg-day)
CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for a specified age group (one for working age 16 to 70)
ED = Exposure duration (in years) for a specified age group (25 years)
AT = Averaging time for lifetime cancer risk (70 years)

As discussed previously, some substances (e.g., semi-volatile organics and metals) are carcinogenic regardless of how they enter the body. Exposures to these substances are called multi-pathway. HRA for a facility that emits a multi-pathway pollutant must, at a minimum, evaluate doses from soil ingestion and dermal exposure. If polycyclic aromatic hydrocarbons, lead, dioxins, furans, or polychlorinated biphenyls are emitted, then the breast-milk consumption pathway becomes mandatory for residential receptors. OEHHA has developed transfer coefficients for these chemicals from the mother to breast milk. The other exposure pathways (e.g., ingestion of homegrown produce or fish) are only evaluated for residential receptors if the facility impacts that exposure medium and the receptor under evaluation can be exposed to that medium or pathway.

Non-inhalation residential cancer risk is calculated using the same steps as inhalation cancer risk. The pathway under evaluation (e.g., soil ingestion) is multiplied by the substance-specific oral slope factor, expressed in units of inverse dose (i.e., $(mg/kg/day)^{-1}$), the appropriate ASF, and exposure duration divided by averaging time to yield the cancer risk for a specified age grouping. Cancer risk for each age group is summed as appropriate for the exposure duration.

If multiple substances are emitted, the substance-specific cancer risks for all exposure pathways are summed to give the (total) multi-pathway cancer risk at the receptor location. HARP2 displays the multi-pathway risk for each carcinogenic substance and a breakdown of the cancer risk from each exposure pathway.

This HRA evaluates mother's milk due to presence of lead in fugitive dust. The default assumption inherent in the intake rate is that the infant's only source of food is breast for the first year (e.g., is fully breastfed), which is one-half of the 0<2 year age group used in the Hot Spots program. Thus, the cancer risk by the mother's milk pathway is calculated with a slightly modified equation using a different exposure duration. Once the cancer risk is determined for the mother's milk pathway then it is summed with the other risks to calculate the total cancer risk for the receptor.

OEHHA recommends that exposure from projects longer than 2 months but less than 6 months be assumed to last 6 months (e.g., a 2-month project would be evaluated as if it lasted 6 months). Exposure from projects lasting more than 6 months should be evaluated for the duration of the project. In all cases, for assessing risk to residential receptors, the exposure should be assumed to start in the third trimester to allow for the use of the ASFs. Thus, for example, if one is evaluating a proposed 10-year project, the cancer risks for the residents would be calculated based on exposures starting in the third trimester through the first ten years of life.

Non-Cancer Risk

Estimates of noncancer inhalation health impacts are determined by dividing an airborne concentration at the receptor by the appropriate REL. This is termed the Hazard Index (HI) Approach. A REL is used as an indicator of potential noncancer health impacts and is defined as the concentration at which no adverse noncancer health effects are anticipated. When a health impact calculation is performed for a single substance, then it is called the hazard quotient (HQ). Each REL for a substance will have one or more target organ systems (e.g., respiratory system, nervous system, etc.) where the substance can have a noncancer health impact. Thus, all HQs have specified target organ systems associated with them. The sum of the Hazard HQs of all chemicals emitted that impact the same target organ is the HI. Inhalation RELs for noncancer health impacts have been developed for acute, 8-hour, and chronic exposures to a number of substances.

Acute RELs are designed to protect against the maximum 1-hour ground level concentration at the receptor. Chronic RELs protect against long-term exposure to the annual average air concentration spread over 24 hours/day, 7 days/week.

Eight-hour RELs are designed to protect people with daily 8-hour schedules, such as offsite workers, in an impacted zone. The 8-hour RELs are used for typical daily work shifts of 8-9 hours and represent concentrations at or below which health impacts would not be expected even for sensitive subpopulations in the general population with repeated daily 8-hour exposures over a significant fraction of a lifetime. The 8-hour RELs can be used to evaluate the potential for health impacts (including effects of repeated exposures) in offsite workers, and to children and teachers exposed during school hours.

Acute, 8-hour, and chronic RELs are needed because the dose metrics and even the health impact endpoints may be different with the different exposure durations of acute, daily 8-hour, and chronic exposures. Also, although chronic REL values are lower or set the same as 8-hour RELs, there are some cases such as special meteorological situations (e.g., significant diurnal-nocturnal meteorological differences) or intermittent exposures where the 8-hour REL may be more protective than the chronic REL.

As discussed above, in order to calculate the acute, 8-hour, or chronic HQ, the maximum ground-level concentration (in µg/m^3) during the appropriate period of time (i.e., 1-hour acute, 8-hour, and 1-year chronic) is divided by the corresponding REL (in µg/m^3) for the substance. If a receptor is exposed to multiple substances that target the same organ system, then the HQs for the individual substances are summed to obtain a Hazard Index (HI) for that target organ as shown in the following equations.

$$HI_{Organ1} = \frac{C_{air,1}}{REL_1} + \frac{C_{air,2}}{REL_2} + \cdots + \frac{C_{air,n,}}{REL_n}$$

or

$$HI_{Organ1} = HQ_1 + HQ_2 + \cdots + HQ_n$$

A HI of 1.0 or less indicates that adverse health effects are not expected to result from exposure to emissions of that substance. As the HI increases above one, the probability of human health effects increases by an undefined amount. However, HI above one is not necessarily indicative of health impacts due to the application of uncertainty factors in deriving the RELs.

There are non-cancer multi-pathway pollutants that are assessed for inhalation, ingestion, and other non-inhalation pathways. Nickel and arsenic are two that are found in fugitive dust and so the non-inhalation exposures to these metals are assessed for the corresponding target organs. Specifically, nickel effects the respiratory, hematologic, and alimentary systems while arsenic affects development; the nervous and cardiovascular systems; and the skin.

2.5 Project-Level Impacts and Mitigation Measures

2.5.1 Conflict with or Obstruction to the Implementation of an Air Quality Plan

Impact Statement

Impact AQ-1: *Would the Project conflict with or obstruct implementation of the applicable air quality plan?* **(Appendix G Threshold Criteria (a))**

Impact Analysis

The SJVAPCD is tasked with implementing programs and regulations required by the CAA and the CCAA. In that capacity, the SJVAPCD has prepared plans to attain Federal and State ambient air quality standards. The SJVAPCD has established thresholds of significance for criteria pollutant emissions, which are based on SJVAPCD NSR offset requirements for stationary sources. Stationary sources in the SJVAPCD are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of SJVAPCD offset requirements are a major component of the SJVAPCD's air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the SJVAPCD's air quality plan" (SJVAPCD, 2015, p. 65).

Planned and current measures to be implemented under the applicable air quality plans do not apply to the Project. Moreover, the Project operators, including WCA, would be required to comply with regional air quality rules promulgated by the SJVAPCD and participate in reducing air pollutant emissions. Lastly, aggregates production is proportional to population growth, which is a factor that is accounted for in air quality plans. Therefore, the Project would not obstruct implementation of the applicable SJVAPCD air quality plan. Project impacts were determined to be less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

2.5.2 Net increase of any criteria pollutant

Impact Statement

Impact AQ-2: *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?* **(Appendix G Threshold Criteria (b))**

Impact Analysis

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are either significant or "cumulatively considerable", meaning they add considerably to a significant environmental impact. An adequate cumulative impact analysis considers a project over time and in conjunction with other past, present, and reasonably foreseeable future projects whose impacts might compound those of the project being assessed.

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development. Future attainment of State and Federal ambient air quality standards is a function of successful implementation of the SJVAPCD's attainment plans. Consequently, the SJVAPCD's application of thresholds of significance for criteria pollutants is relevant to the determination of whether a project's individual emissions would have a cumulatively significant impact on air quality.

A CEQA Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (CCR §15064(h)(3)).

Thus, if project emissions (change from baseline) exceed thresholds for NOx, ROG, PM_{10} or $PM_{2.5}$, then the project would result in a cumulatively considerable net increase of a criteria pollutant for which the SJVAPCD is in non-attainment under applicable Federal or State ambient air quality standards. This does not imply that if the project impact is less than those significance criteria, it cannot be cumulatively significant. The significance criteria are presented in Table 8 and include thresholds that are applied separately to construction and operation phases of a project. Construction phase emissions are summarized and compared to applicable thresholds in Table 30.

Table 30 Construction Phase Criteria Pollutant Annual Emissions

	ROG (ton/yr)	CO (ton/yr)	NO_X (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SOx (ton/yr)
Construction	0.048	0.29	0.49	0.022	0.018	0.001
Threshold	10	100	10	15	15	27
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Appendix D.

Hourly and annual emissions were quantified for the excavation phase. Annual emissions thresholds apply separately for Permitted and Permit-Exempt sources. Table 31 and Table 32 present annual and hourly excavation phase emissions respectively, and compare the emissions to the applicable significance thresholds.

Table 31 Excavation Phase Criteria Pollutant Annual Emissions

Criteria Pollutant	Permitted Sources (tons/yr)	Permitted Sources Significance Threshold (tons/yr)	Exceeds Permitted Sources Threshold?	Permit-Exempt Sources (tons/yr)	Permit-Exempt Sources Significance Threshold	Exceeds Permit-Exempt Threshold?
ROG	-0.08	10	No	-0.35	10	No
CO	-0.27	100	No	2.20	100	No
NO_X	-0.66	10	No	-5.10	10	No
PM_{10} (total)	-0.02	15	No	14.37	15	No
$PM_{2.5}$	-0.03	15	No	5.93	15	No
SO_X	-0.01	27	No	-0.10	27	No

Source: Appendix C.

Table 32 Excavation Phase Criteria Pollutant Daily Emissions

Criteria Pollutant	CO lbs/day	NO_x lbs/day	PM_{10} lbs/day	$PM_{2.5}$ lbs/day	SO_x lbs/day
Baseline	163	457	260	80	3.24
Excavation	119	221	529	160	0.40
Project	-45	-236	269	80	-2.83
Screening Criteria	100	100	100	100	100
Exceeds Criteria?	**No**	**No**	**Yes**	**No**	**No**

Source: Appendix C.

Table 30, Table 31, and Table 32 show that except for PM_{10} the Project does not exceed thresholds.

The level of road dust control in the baseline is based upon watering two to three times per day. That level of watering is assigned 80% control efficiency. Increasing the control efficiency to 90% would result in an additional reduction of approximately 50%. As shown in EPA's AP-42 Figure 13.2.2-2 pertaining to unpaved

roads, watering alone can achieve up to 95% control. The certified Kaweah South Project EIR assigned 93% to the combination of "limiting vehicle speed to 15 mph, improving surfaces with aggregate, and watering" (Tulare County, 2006). Thus, 90% control is feasible and achieved in practice using water or a combination of water and chemical dust suppressants (e.g., magnesium chloride, lignin sulfonate, etc.). The excavation phase has maximum net emissions (Project minus baseline) of 269 lbs/day which would be reduced to 84.8 lbs/day with the additional control (Appendix C, Mitigated Emissions, Maximum Year). Therefore, with Mitigation Measure AQ-1, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard and is therefore less than significant.

Level of Significance Before Mitigation

Daily PM_{10} emissions are potentially significant.

Mitigation Measures

Mitigation Measure AQ-1 is recommended to avoid causing or contributing to an existing or projected violation of an air quality standard.

Mitigation Measure AQ-1*:* *Roads upon which material is hauled to the on-site plant for processing shall be controlled by methods that will achieve 90% reduction of fugitive dust. This can be achieved by frequent watering, use of chemical dust suppressants, or a combination of watering and chemical dust suppressants. Other methods which achieve 90% reduction of fugitive dust may be acceptable with Lead Agency approval.*

Level of Significance After Mitigation

Less than significant.

2.5.3 Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

Impact Statement

Impact AQ-3: *Would the Project expose sensitive receptors to substantial pollutant concentrations?* **(Appendix G Threshold Criteria (c))**

Impact Analysis

Determination of whether project emissions would expose sensitive receptors to substantial pollutant concentrations is a function of assessing potential health risks. Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. When evaluating whether a development proposal has the potential to result in localized impacts, the nature of the air pollutant emissions, the proximity between the emitting facility and sensitive receptors, the direction of prevailing winds, and local topography must be considered (SJVAPCD, 2015, p. 66).

A Health Risk Assessment was performed as discussed in Section 2.4.7 to evaluate the effects of TACs including DPM from vehicles and other substances potentially found in fugitive dust emissions (i.e., metals and crystalline silica). Risk from excavation and operation of the reservoir are each incorporated into the values presented in Table 33 which shows the cancer risk at the closest residential and sensitive receptors including Sequoia Union Elementary School.

Health risk is determined based on the change in conditions associated with the implementation of the Project. Emissions sources present in the baseline cease to operate, and emissions from the Project are introduced. Therefore, baseline risk is modeled as negative risk (emissions going away), and Project risk is modeled as positive (new emissions). In many cases, Project emissions end up being lower than those in the baseline, due to newer technologies and updated regulations. In such cases, risk to receptors may be reduced, as the Project results in a reduction of emissions. In cases where risk to a receptor is greater in the baseline than in the Project, the risk is represented as a negative number.

Table 33 Health Risk Results

Receptor Figure Label – Type	Receptor Model ID Number	Excess Cancer Cases per Million People Exposed	Chronic Hazard Index	Acute Hazard Index
1 – Residence	396	-22.1	0.0	0.000
2 – Residence	397	-16.4	0.0	0.020
3 – Residence	398	4.4	0.23	0.031
4 – Residence	399	3.9	0.14	0.059
5 – Residential	400	1.9	0.08	0.065
6 – Residential	401	-0.2	0.03	0.094
7 – Residential	402	1.9	0.09	0.075
8 – Elementary School	403	-0.4	0.04	0.059
9 – Residential	404	-3.1	0.03	0.099
10 – Residential MEIR (TID Owned)	405	18.4	0.59	0.33
11 – Residential	406	-55.2	0	0.000
12 – Residential	407	-52.4	0	0.000
13 - Residential	408	-1.8	0.001	0.035
14 – Worker, Cemex Facility MEIWR	409	0.76	0.07	0.25
15 – PMI	519	N/A	N/A	0.46
Significance Threshold	N/A	20	1.0	1.0
Threshold Exceeded?	**N/A**	**No**	**No**	**No**

Source: Appendix E.

Note: These receptors represent locations of highest exposure. Discrepancies between table and appendix values may exist due to rounding. Negative values represent risk reduction compared to baseline levels.
MEIR: Maximum Exposed Individual Receptor; MEIW: Maximum Exposed Individual Worker; PMI: Point of Maximum Impact

As shown in Table 33, health risk from the Project is less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

2.5.4 Odors Affecting a Substantial Number of People

Impact Statement

Impact AQ-4: *Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?* **(Appendix G Threshold Criteria (d))**

Impact Analysis

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, the SJVAPCD recommends that odor analyses strive to fully disclose all pertinent information.

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the San Joaquin Valley. These are presented in Table 34 below along with a reasonable distance from the source within which, the degree of odors could possibly be significant (It should be noted that aggregate mining/processing facilities are not included on Table 34). If the proposed project would result in sensitive receptors being located closer than the screening level distances, a more detailed analysis should be provided and include information regarding odor complaints (SJVAPCD, 2015, p. 103).

Table 34 Odor Screening Distances

Type of Facility	Odor Screening Distance (miles)
Wastewater Treatment Facilities	2
Sanitary Landfill	1
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	1
Chemical Manufacturing	1
Fiberglass Manufacturing	1
Painting/Coating Operations (e.g., auto body shops)	1
Food Processing Facility	1
Feed Lot/Dairy	1

Type of Facility	Odor Screening Distance (miles)
Rendering Plant	1

Source: (SJVAPCD, 2015).

Diesel exhaust from mobile equipment/vehicles has a slight odor. Odor intensity would decrease rapidly with distance and is not expected to be frequently (or at all) detectable at locations outside of the Project site boundary. In addition, given the subjective nature of odors, such odors are generally only considered to be objectionable by residential receptors (i.e., not by occupational workers). Given the rural nature of the Project vicinity, there are few residences located within 1 mile of the reservoir where the majority of the on-site emissions of diesel exhaust from mobile equipment/vehicles would occur. Therefore, it is not anticipated that objectionable odors affecting a substantial number of people could result from the Project.

In addition, the Project is required to comply with the SJVAPCD nuisance rule (Rule 4102), which reads:

> *"A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property."*

The Project will not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people and therefore, the Project impacts were determined to be less than significant.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.0 GREENHOUSE GASES

This section of the AQCCIA assesses potential GHG impacts of the Project. The methodologies used and the information provided in this section are supported by calculations in Appendices C and D.

3.1 Regulatory Setting

3.1.1 Characteristics of Greenhouse Gases - Climate Change Pollutants

The accumulation of GHGs in the atmosphere contributes to the regulation of the earth's temperature. Some GHGs can remain in the atmosphere for long periods of time (i.e., long-lived). There are six GHGs recognized under the Kyoto Protocol and have been found by the International Panel on Climate Change (IPCC) to have a "Long-lived" effect on global climate change. The primary one associated with the Project are Nitrous Oxides (N_2O). Also see Appendix B for additional detail.

3.1.1.1 Greenhouse Gases - Climate Change Pollutants

In general, there are six (6) compounds/classes of GHGs that are counted when emissions are inventoried. Each GHG exhibits a different global warming potential (GWP). The mass of emissions of each GHG is multiplied by its GWP to determine the carbon dioxide equivalent (CO_2e) potential for global warming. GWPs have changed over time by the Intergovernmental Panel on Climate Change (IPCC) which is considered an authority on GHGs and their effects. The CAP and CARB emissions inventories and plans use GWPs that are an iteration or two behind and the most recent IPCC publication. Characteristics of each long-lived GHG and the associated GWP is presented below.

Carbon Dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include burning coal, oil, natural gas, and wood. By definition, CO_2 has a GWP equal to one (1).

Methane (CH_4) is a flammable GHG. A natural source of CH_4 is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH_4, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle. CH_4 has a GWP equal to 28.

Nitrous Oxide (N_2O) is a colorless GHG. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O has a GWP equal to 265.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for chlorofluorocarbons (CFCs). Of all the GHGs, they are one of three groups with the highest global warming potential. HFCs are human made for applications such as air conditioners and refrigerants. HFCs have GWPs that range from 124 (HFC 125a) to 14,300 (HFC 23).

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. PFCs have GWPs that range from 7,390 (PFC 14) to 12,200 (PFC 116).

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection. SF_6 has a GWP equal to 22,800.

3.1.2 Federal

To date, there is no federal overarching law specifically related to climate change or the reduction of GHGs. The Environmental Protection Agency (EPA) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA,* 549 US 497 (2007). The Supreme Court found that GHGs are air pollutants covered by the Clean Air Act, and the EPA Endangerment Findings concluded the elements CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 threatened public health for both current and future generations. In 2009, the U.S. EPA published a rule for the mandatory reporting of GHG from sources that in general emit 25,000 metric tons or more of carbon dioxide equivalent per year in the United States. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). This collection of comprehensive, nationwide emissions data is intended to provide a better understanding of the sources of GHGs and to guide development of policies and programs to reduce emissions (U.S. EPA, 2013). Additional federal actions have included the implementation of standards for vehicles, biofuel production, and power generation. Federal actions relating to GHG emissions are summarized and provided in Appendix B.

3.1.3 State

A more comprehensive list of the California legislation over the last approximately 32 years as well as a summary of GHG scoping plan goals and recent developments are provided in Appendix B. Table 35 provides al list of potentially relevant California regulations.

Table 35 California Climate Change Legislation

Date	Legislation	Description
September 10, 2018	Senate Bill 100 (De León, Chapter 312, Statues of 2018)	California Renewables Portfolio Standard Program: emissions of greenhouse gases. This bill establishes the 100 Percent Clean Energy Act of 2017 which increases the Renewables Portfolio Standard (RPS) requirement from 50 percent by 2030 to 60 percent, and creates the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.

Date	Legislation	Description
July 26, 2017	Assembly Bill 617 (Christina Garcia, Chapter 136, Statutes of 2017)	Companion to Cap-and-Trade Extension Establishes a groundbreaking program to measure and reduce air pollution from mobile and stationary sources at the neighborhood level in the communities most impacted by air pollutants. Requires the Air Resources Board to work closely with local air districts and communities to establish neighborhood air quality monitoring networks and to develop and implement plans to reduce emissions. The focus on community-based air monitoring and emission reductions will provide a national model for enhanced community protection.
July 25, 2017	Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017)	Cap-and-Trade Extension Extends and improves the Cap and Trade Program, which will enable the state to meet its 2030 emission reduction goals in the most cost-effective manner. Furthermore, extending the Cap and Trade Program will provide billions of dollars in auction proceeds to invest in communities across California.
September 19, 2016	Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)	Short-lived Climate Pollutants Establishes statewide reduction targets for short-lived climate pollutants.
September 8, 2016	Assembly Bill 197 (Eduardo Garcia, Chapter 250, Statutes of 2016)	Greenhouse gas regulations Prioritizes direct emission reductions from large stationary sources and mobile sources.
September 8, 2016	Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)	Greenhouse Gas emission reduction target for 2030 Establishes a statewide greenhouse gas (GHG) emission reduction target of 40 percent below 1990 levels by 2030.

Source: California Air Quality and Climate Legislation | California Air Resources Board.

Table 36 California Climate Change Regulations

Regulation	Description
AB 32 Climate Change Scoping Plan	In June 2021, CARB began holding a Public Workshop Series to commence development of the 2022 Scoping Plan. The 2022 Scoping Plan Update will assess progress towards achieving the SB 32 2030 target of a 40% GHG reduction and lay out a path to achieve carbon neutrality by 2045.
Greenhouse Gas Reduction Fund	State program allocating proceeds from cap-and-trade auctions to support investments and projects that reduce greenhouse gas emissions throughout California.

Regulation	Description
Amendments to the Mandatory Greenhouse Gas Reporting Regulation	The CARB Regulation for the Mandatory Reporting of Greenhouse Gas Emissions was originally approved in 2007 and revised in 2010, 2012, 2013, 2014, 2016 and 2018. Amendments to MRR were approved on March 29, 2019 and became effective on April 1, 2019, for 2019 data. The 2019 amendments were implemented to: • Support California's Cap-and-Trade Regulation to ensure consistency with the calculation of compliance obligations • Ensure that reported GHG emissions and product data are accurate and complete in order to support California's GHG reduction programs
Cap & Trade Amendments	December 2018 amendments to the cap-and-trade regulation included: • New price containment points and a price ceiling • Limits on offset use • New industrial facility leakage assistance factors for 2018 and beyond • Clarifications on electric and gas utility use of allowance value • Compliance provisions for Energy Imbalance Market (EIM)-related GHG emissions • Offset invalidation clarifications • Streamlining implementation requirements • Adjustments to linkage reflecting Ontario's actions to revoke its participation in the cap-and-trade market. September 2016 amendments to the cap-and-trade regulation included: • Emission caps for the post-2020 program • Post-2020 continuation of the allowance price containment reserve • Linking with Ontario's cap-and-trade program • Compliance with the federal Clean Power Plan • Modifications to allowance allocation
Cap & Trade Offset Protocols	The Air Resources Board has adopted five protocols for offset compliance projects. In addition to the original four protocols adopted in 2011, ARB has adopted: Mine Methane Capture (MMC) Projects Compliance Offset Protocol, adopted April 2014
Cap & Trade Link with Quebec	California linked its cap-and-trade program with Quebec's program in January 2014. Linkage allows for the use of compliance instruments from Quebec's greenhouse gas emission trading system to meet compliance obligations pursuant to the California Cap-and-Trade Regulation, and the reciprocal approval of compliance instruments issued by California to meet compliance obligations in the external trading program.
Mandatory Commercial Recycling	This regulation addresses recycling requirements for businesses that generate 4 or more cubic yards of commercial solid waste per week and multifamily residential dwellings with 5 or more units, regardless of the amount of waste generated; local jurisdiction requirements for education, outreach, monitoring and reporting; and CalAsphalt and concrete recycling review. The regulations were approved on May 7, 2012.

Source: (Climate Change | California Air Resources Board, 2021).

On December 14, 2017, CARB approved the 2017 Climate Change Scoping Plan Update (Scoping Plan) which aims to reduce GHG emissions. The Scoping Plan "is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state. Every sector, every local government, every region, every resident is part of the solution. The Plan underscores that there is no single solution but rather a balanced

mix of strategies to achieve the GHG target. This Plan highlights the fact that a balanced mix of strategies provides California with the greatest level of certainty in meeting the target at a low cost while also improving public health, investing in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs and energy diversity. Successful implementation of this Plan relies, in part, on long-term funding plans to inform future appropriations necessary to achieve California's long-term targets." (2017 Scoping Plan, p. ES4).

3.1.4 San Joaquin Valley Unified Air Pollution Control District

SJVAPCD GHG policy is established in the *District Policy Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency* (SJVAPCD, 2009). The document outlines a methodology to determine if a project meets the Best Performance Standards (BPS) for GHG emissions. The Document states, "Projects implementing BPS would be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions". When serving as the lead agency, the District requires stationary sources that do not comport with a BPS to demonstrate GHG reductions of 29% as compared to Business-as-Usual. Business-as-Usual is defined by the District as "The emissions for a type of equipment or operation within an identified class and category projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period".

This policy, however, does not apply to the Project; CARB regulations adopted in 2010 established a cap-and-trade program for the largest sources of GHG emissions in the State. Included in cap-and-trade are the fuels that are utilized by the Project.

South Coast Air Quality Management District (SCAQMD) guidelines, which are more recent, were used to evaluate significance of GHG impacts. Specifically, SCAQMD excludes emissions from sectors that are required to participate in the Cap-and-Trade Program administered by the California Air Resources Board (CARB) as discussed in the *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant - Crude Oil Storage Project* (SCAQMD, 12/12/2014).[3] The Project analysis therefore emits GHGs from fuel burned in vehicle engines and fuel burned in stationary equipment. Transportation fuel suppliers and importers are required to report emissions under the Cap-and-Trade which is designed to reduce GHG emissions as needed to achieve emissions reductions described in related planning documents which primarily consists of the AB 32 Scoping Plan.

3.1.5 Tulare County

The Tulare County Climate Action Plan (CAP) (Tulare County, 2012a) serves as a guiding document for County actions to reduce GHG emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update.

[3] http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2014

General Plan 2030

The Tulare County General Plan (Tulare County, 2012b) policies that relate to greenhouse gas emissions from the proposed Project are listed below.

AQ-1.5 California Environmental Quality Act (CEQA) Compliance

The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonably mitigated when feasible.

AQ-1.7 Support statewide Climate Change Solutions

The County shall monitor and support the efforts of CalEPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code §38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

AQ-1.8 Greenhouse Gas Emissions Reduction Plan/Climate Action Plan

The County will develop a Greenhouse Gas Emissions Reduction Plan (Plan) that identifies greenhouse gas emissions within the County as well as ways to reduce those emissions. The Plan will incorporate the requirements adopted by the California Air Resources Board specific to this issue. In addition, the County will work with the Tulare County Association of Governments and other applicable agencies to include the following key items in the regional planning efforts.

1. Inventory all known, or reasonably discoverable, sources of greenhouse gases in the County,
2. Inventory the greenhouse gas emissions in the most current year available, and those projected for year 2020, and
3. Set a target for the reduction of emissions attributable to the County's discretionary land use decisions and its own internal government operations.

AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions

The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.

Climate Action Plan

The CAP describes itself as follows.

> *…a four-step process recommended by the Institute for Local Government.*
>
> *First, an inventory of greenhouse gas emission sources was developed for a base year (2007) to identify the most important categories and potential for emission reductions.*
>
> *Second, future year inventories for 2020 and 2030 were projected to illustrate what emissions would be in the future accounting for projected growth, but without controls on the sources. The future year inventory is referred to as a "business-as-usual scenario." The year 2020*

> *projection was used to allow comparison to the State's target year in CARB's Scoping Plan. The year 2030 projection was used to identify the growth in emissions that would occur by the General Plan planning horizon year. The 2020 inventory was projected by interpolating emissions growth predicted between 2007 and 2030.*
>
> *The third step was to identify and describe policies, regulations, and programs that apply to sources in the County's emission inventories and will achieve reductions by the target years. The policies, regulations, and programs considered in the CAP include those by federal, state, and local governments. These were then quantified to the extent possible using best available methodologies and data to determine the amount of reductions that are needed by the target years from Tulare County to achieve consistency with state targets.*
>
> *The last step was the development of a monitoring program that tracks implementation progress and emission reductions over time and identifies a process for taking corrective actions, if needed.* (Tulare County, 2012a, pp. 2-3).

The CAP describes the County's, the State's and the SJVAPCD's role in reducing GHGs as follows:

> *The County's focus is on emission sources within its regulatory authority, which are mainly related to land use and the local transportation system. To some extent, the County can influence activities that provide greenhouse gas reductions such as water conservation and solid waste diversion and recycling. The County also can require feasible mitigation measures for new projects as a Lead Agency under the CEQA… new projects are required to address greenhouse gas and climate impacts under CEQA during the approval process.*
>
> *…*
>
> *The CARB has the primary responsibility for the State's climate programs and regulations that would apply to mobile and industrial sources of greenhouse gases. The California Energy Commission has primary responsibility for energy efficiency standards related to buildings and certain consumer products. The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates stationary, areawide, and indirect sources of emissions that impact health. Many SJVAPCD regulations on health-based pollutant emissions also reduce greenhouse gas emissions. (Tulare County, 2012a, p. 3).*

Regarding CEQA, the CAP states:

> *One of the most important uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. Greenhouse gas emissions from an individual project will not result in a perceptible impact on global climate. Impacts to global climate are caused by the cumulative impacts of greenhouse gases emitted anywhere and everywhere on Earth. The Office of Planning and Research CEQA Guidelines encourages use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the policies, implementation measures, and emission reduction targets contained in the CAP would have a less than significant impact on climate change. (Tulare County, 2012a, p. 4).*

…

Although it is technologically possible to reduce greenhouse gases if cost is not considered, the potential exists that a locally implemented measure will only serve to relocate the emissions to another place that does not require the new technology. Therefore, even if emission rates are lower in one place, it could have no effect on global climate if the emission-producing activity is shipped out of State or overseas. (Tulare County, 2012a, p. 4).

…

Projects implementing the General Plan that are subject to CEQA will be required to demonstrate consistency with the CAP and achieve emission reductions that will enable the County to meet its greenhouse gas reduction target. The policies focus on the following:

- *Land Use and Transportation System Improvements*
- *Alternative, Non-automotive Travel Modes*
- *Building Energy Efficiency/Green Building Design*
- *Water Conservation*
- *Waste Reduction Program*

(Tulare County, 2012a, p. 11).

…

The CAP needs to provide a strategy that would result in the County achieving a 26-percent reduction in order for it to qualify for use in CEQA consistency findings. (Tulare County, 2012a, p. 12)

Based on the analysis conducted in preparing the CAP, an overall additional reduction of 1.1 percent from new and existing development is required to show consistency with the Scoping Plan target for development related sources of 26.2 percent. Achieving a 1.1-percent reduction from new development by 2020 will require an average project level reduction of 6 percent. (Tulare County, 2012a, p. 14).

The organizational boundary used for the CAP includes emissions that are reasonably attributable to the County's discretionary land use decisions and the County's internal government operations. As such, areas that are within incorporated cities are considered outside the County's organizational boundary. The CAP operational boundary includes emissions associated with operations owned or controlled by the County. These include direct and indirect emissions resulting from the energy (electricity and natural gas), mobile source (on- and off-road), agriculture (dairy/feedlots), and solid waste (landfills) sectors in unincorporated Tulare County and are summarized in Table 37.

Table 37 Operational Boundaries of Emissions in CAP

Sector	Source of Emissions	Data Source Used in CAP
Mobile Sources	On-road	TCAG, EMFAC Model (CARB)
	Offroad	OFFROAD2007 Model (CARB)

Sector	Source of Emissions	Data Source Used in CAP
Solid Waste	Trash	LandGEM Model, Tulare County Resource Management Agency
Natural Gas	Residential	The Gas Company
	Commercial	The Gas Company
	Industrial	The Gas Company
Dairy/Feedlot	Dairy/Feedlot	Jones and Stokes, 2006; EPA
Electricity	Residential	PG&E, SCE
	Commercial	PG&E, SCE
	Industrial	PG&E, SCE

Source: (Tulare County, 2012a, p. A6).

Notes: Tulare County Association of Governments (TCAG), Pacific Gas and Electric (PG&E), Southern California Edison (SCE).

Table 38 presents the list of emissions reductions that the CAP takes credit for in demonstrating consistency with the AB 32 Scoping Plan and objective to reduce GHG emissions to 1990 levels by 2020. The following discussion in the CAP is applicable to the Project. "*Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will be subject to conditions of approval and mitigation measures that will reduce GHG emissions beyond State regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit GHGs to levels that meet or exceed State targets*." (Tulare County, 2012a, p. 55). Other measures only applicable to commercial, residential and mixed uses (i.e., not industrial) are presented in Table 39 and Table 40 for completeness.

Table 38 Emission Reductions from State Regulations and Measures

Affected Emission Sources	California Legislation	Percent Reduction from 2020 GHG Inventory	Fraction Applicable to Tulare Co. Inventory	End Use Sector	Scaled Emission Reduction Credit
Mobile	AB 1493 Pavley	19.7	0.387	On-road passenger/ light truck transportation	7.62
	LCFS	7.2	0.387	On-road passenger/ light truck transportation	2.79
	LCFS	7.2	0.067	On-road Heavy/ Medium Duty transportation	0.48

Affected Emission Sources	California Legislation	Percent Reduction from 2020 GHG Inventory	Fraction Applicable to Tulare Co. Inventory	End Use Sector	Scaled Emission Reduction Credit
	Heavy Duty Efficiency	2.9	0.013	On-road Heavy Duty transportation	0.04
	Passenger Vehicle Efficiency	2.8	0.387	On-road passenger/ light truck transportation	1.08
Area	Energy Efficiency Measures	9.5	0.039	Natural Gas (Residential)	0.37
			0.12	Natural Gas (Non-Residential)	1.13
Indirect	Renewable Portfolio Standard	18.3	0.271	Electricity (excluding cogeneration)	4.96
	Energy Efficiency Measures	15.7	0.271	Electricity	4.25
	Solid Waste Methane	14.2	0.106	Solid Waste (10.6)	1.51
	Solar Roofs	1.5	0.271	Electricity (excluding cogeneration) (27.1)	0.41
Total Reductions from Statewide Measures in Tulare County					**24.63**

Source: (Tulare County, 2012a, p. B12).

Table 39. GHG Emission Reduction Measures - Development Projects

Bicycle/Pedestrian/Transit Measures 1. Bike parking 2. End of trip facilities 3. Bike parking at multi-unit residential 4. Proximity to bike path/bike lanes 5. Pedestrian network (two measures 5 and 5a) 6. Pedestrian barriers minimized 7. Bus shelter for existing transit service 8. Bus shelter for planned transit service	11. Minimum parking 12. Parking reduction beyond code 13. Pedestrian pathway through parking 14. Off street parking - Parking facilities are not adjacent to street frontage (three measures of varying degree of effectiveness and credit toward reducing GHG: a, b, and c)

9. Traffic calming ***Parking Measures*** 10. Paid parking a. Urban site within 1/4 mile from transit stop b. Urban site greater than 1/4 mile from transit stop c. Paid Parking- Suburban site within 1/4 mile of transit stop d. Paid Parking- Suburban site greater than 1/4 mile from transit stop e. Parking cash out	***Site Design Measures*** 15. Office/Mixed- Use proximate to transit (based on type of transit facility and floor to area ratio (FAR) of development. a. Planned Light Rail Transit b. Planned Bus Rapid Transit c. Existing Light Rail Transit d. Existing Bus Rapid Transit 16. Orientation toward existing transit, bikeway, or pedestrian corridor 17. Orientation toward planned transit, bikeway, or pedestrian corridor
18. Residential Density with No Transit based on number of units per acre (du/acre) within the residential portion of the project's net lot area. There are seven (7) density credit categories ranging from no credit for 3 – 6 du/acre to 10 credits for 50 or more du/acre. a. Residential density With Planned Light Rail Transit uses same categories as 18 but provides slightly more credit. b. Residential Density with Planned Bus Rapid Transit c. Residential Density with Existing Light Rail Transit d. Residential Density with Existing Bus Rapid Transit 19. Street grid 20. Neighborhood Electric Vehicle access (three sub-measures a, b, and c). 21. Affordable Housing Component (10 submeasures a through j where % reduction=% units deed-restricted below the market rate housing *0.04).	22. Mixed-Use Measures (7 submeasures a through g based on jobs: houses ratio beginning at 0.5 and ending at 4.0. 23. Suburban mixed-use 24. Other mixed- use ***Building Component Measures*** 25. Energy Star roof 26. Onsite renewable energy system 27. Exceed Title 24 by 20% 28. Solar orientation 29. Non-Roof Surfaces 30. Green Roof ***TDM and Misc. Measures*** 31. Electric lawnmower (complimentary for buyer of residence).

Source: (Tulare County, 2012a, pp. C-1 to C-23).

Table 40 GHG Reduction Measures Requiring Additional Investigation

1. Bike lane street design	14. School Bus Services
2. Bike & pedestrian design	15. Shuttle Bus Services
3. School siting	16. Energy efficient appliances
4. Transit street design	17. Renewable Energy Use
5. Site design measures	18. Solar Panels in Parking areas
6. Other mixed- use	19. Photovoltaic Roofing Tiles
7. Mixed-Use	20. Tree Planting
8. Open Space	21. Local Farmer's Market

9.	Natural Gas Stove	22.	Community Gardens
10.	Solar Design	23.	Best management practices
11.	Vehicle Idling	24.	Land Use Density
12.	Ride Sharing Programs	25.	Zero Emission Infrastructure
13.	Shuttle Service	26.	Low carbon fuel incentive program

Source: (Tulare County, 2012a, pp. C-24 & C-25)

3.2 Environmental Setting

Climate change refers to global changes in the average weather of the Earth measured by changes in wind patterns, storms, precipitation, and temperature. While climate change is global in scale, California-specific impacts to the climate may result in a loss of snow-pack, increased risk of large wildfires, and a potential reduction in the quality and quantity of certain agricultural products.

Gases that trap heat in the atmosphere are GHGs, analogous to the way a greenhouse retains heat. Consequently, these GHG emissions are believed to directly affect the global climate.

Emissions Inventories

CARB's most recent GHG emission inventory, the 2020 Edition, tracks the emissions of seven GHGs identified in the California Health and Safety Code for years 2000 to 2018. In 2018, total GHG emissions were 425 $MMTCO_2e$, an increase of 1.0 $MMTCO_2e$ compared to 2017. Emissions have decreased since peak levels in 2004. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product (GDP)) is declining, representing a 43% decline since 2000, while the State's GDP has grown 59% during this period (Trend Report, 2020, pp. 1-3).

The transportation sector remains the largest source of GHG emissions in the State, accounting for 40% of statewide emissions in 2018. Emissions from the electricity sector have increased slightly in 2018 and account for 15% of the inventory. Emissions from the remaining sectors have remained relatively constant, although emissions from high-GWP gases have continued to climb as they replace ozone depleting substances banned under the Montreal Protocol (Trend Report, 2020, p. 5).

3.3 Threshold Criteria

Determination of whether an impact is significant usually involves the comparison of Project impact levels to threshold criteria set by the lead agency. For air quality and GHG impacts, lead agencies often rely on guidance from a responsible agency. In this report, SCAQMD guidance is utilized, as discussed in Section 3.1.4.

3.3.1 CEQA Guidelines Appendix G

The Environmental Checklist Form in Appendix G of the CEQA Guidelines presents questions about projects that, if true for a particular project, would be considered a significant impact. This document considers the following Environmental Checklist Form questions to be the Significance Thresholds for GHG emissions from this Project.

Would the project:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

3.3.2 Additional Threshold Criteria

Tulare County

The CAP identifies the items in Table 41 as requirements for determining consistency of a project with the CAP.

Table 41 CEQA Project Requirements for Consistency with CAP

Item	Required for Consistency?
Percent reduction in greenhouse gas emissions	6%
Consistency with General Plan policies	Yes
Consistency with Rural Valley Land Plans or Foothill Growth Management Plan development criteria	Yes
Consistency with Urban Growth Boundary expansion criteria	Yes
Consistency for development within Rural Community Urban Development Boundaries and Hamlet Development Boundaries	Yes

Source: (Tulare County, 2012a, p. 58)

South Coast Air Quality Management District

This analysis utilizes SCAQMD guidelines as described in Section 3.1.4. With the new cap and trade policy, fuels used by the Project are regulated at a higher level, so GHG emissions associated with these fuels are calculated and summarized for disclosure purposes. SCAQMD uses a 10,000 MT/yr CO_2e for determining significant impacts for proposed projects. (SCQAMD, 2008) The SCAQMD threshold is compared to the Project GHG emissions for context and disclosure.

3.4 Methodology

3.4.1 CEQA Baseline

The baseline condition consists of emissions associated with excavation of materials at the Seaborn Site. The amount of work required to excavate and process material at the Seaborn site and for the Project is considered to be equal because of the similar topography of the sites, similar use of mining equipment, and the fact that the Project would not exceed the previous production rate nor would it increase the amount of offsite on-road haul truck or vehicle traffic. In addition, the Project's processing plants would move along with the excavation activities as it progresses through the site; therefore, reducing the amount of on-site travel by haul trucks or other equipment associated with transporting the aggregate to the processing plants. The maximum annual CO_2e emissions during the baseline period is conservatively represented by assuming average annual production rate 500,000 tons per year, and summarized in Table 42. Detailed calculations are provided in Appendix C.

Table 42 Baseline GHG Emissions at Maximum Historical Rate

Source	CO_2e (MT/yr)
Crush/Recycle Plant Engine	86
Excavation Off-Road Engines	645
Off-Road Vehicle Haul	549
Total	**1,280**

Source: Appendix C.

Notes: Average historical productionrate assumed to be 500,000 tons aggregate processed per year. The wash/screen plant operates on electricity provided by SCE.

Converted from App. C based on 2204.6 lb/MT. GWP of CH_4 assumed to be 28 per IPCC Fifth Assessment Report (AR5).

3.4.2 Project Excavation Phase

Equipment and activity levels for excavation in the baseline and for the Project are presented in Section 2.4 and the associated GHG emissions are summarized in Table 43 below. Detailed calculations are provided in Appendix C.

Table 43 Project Excavation Phase GHG Emissions at Proposed Maximum Annual Rate

Source	CO_2e (MT/yr)
Crush/Recycle Plant Engine	85
Excavation Off-Road Engines	638
Off-Road Vehicle Haul	598
Dewatering Pumps	95
On-Road Vehicle Haul	79
Slurry Wall Installation	613
Total	**2,108**

Source: Appendix C.

Notes: Maximum annual rate of 650,000 tons processed per year. The wash/screen plant operates on electricity provided by SCE

Converted from App. C based on 2204.6 lb/MT. GWP of CH_4 assumed to be 28 per IPCC Fifth Assessment Report (AR5).

3.4.3 Project Construction Phase

The construction phase consists of the following features:

- Site security features and on-site construction office (prefabricated trailer) including an access gate and perimeter road;
- Inflow channel consisting of a weir, chute, and dissipation pool and Outflow Channel consisting of a weir each requires an excavator, backhoe, water truck, loader, compactor, cement trucks, cement pumps, and cranes; and
- Generator building and floating barge pump, including an aboveground diesel tank, would require an excavator, water truck, backhoe, compactor, trencher and cement trucks.

As discussed previously in regard to criteria air pollutants, CO_2e emissions associated with off-road mobile equipment were calculated using CalEEMod. The estimated mass of GHGs that would be emitted during

construction phase of the Project was determined to be an annual maximum of 96.7 Metric tons of CO_2e per year (Appendix D), based on the activity levels provided by Provost and Pritchard Consulting Group (Appendix B).

3.4.4 Operation Phase

Calculated operation phase emissions include:

- Operation of the generators;
- Off-road engines for road maintenance;
- On-road support vehicles.

Operation phase emissions are presented in Table 44 and detailed calculations are provided in Appendix C.

Table 44 Operation Phase GHG Emissions

Source	CO_2e (MT/yr)
Reservoir Operation Pumps	147
Off-Road Engines	23
On-Road Vehicles	5
Total	**175**

Source: Appendix C.

3.5 Project-Level Impacts and Mitigation Measures

3.5.1 Generate GHG Emissions That May Have a Significant Impact on the Environment

Impact Statement

Impact GHG-1: *Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?* **(Appendix G Threshold Criteria (a)).**

Impact Analysis

"It is widely recognized that no single project could generate enough GHG emissions to noticeably change the global climate temperature. However, the combination of GHG emissions from past, present, and future projects could contribute substantially to global climate change. GHG emissions, and their associated contribution to climate change, are inherently a cumulative impact issue. Therefore, project-level impacts of GHG emissions are treated as one-in-the-same as cumulative impacts." (SJVAPCD, 2015, p. 111). As recognized by SJVAPCD in the preceding quote, climate change is a cumulative effect and no single project is large enough to impact climate change. Thus, the Project would not, by itself, either directly or indirectly result in a significant impact on the environment due to generation of GHG emissions.

This is reflected in the 2017 Scoping Plan, which regulates fuels at a level in the supply chain above the project, such that the project has no choice but to use energy in California that is already regulated. The Project therefore does not have its own emissions, but is simply a location in which GHG emissions are taking place as

a result of fuel that is already regulated. Therefore, the Project itself cannot have a significant impact on the environment.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

3.5.2 Conflict with an Applicable Plan, Policy or Regulation that Reduces GHGs

Impact Statement

Impact GHG-2: *Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?* **(Appendix G Threshold Criteria (b)).**

Impact Analysis

Project emissions of GHGs are presented in Table 45 below, primarily for purposes of disclosure. Portions of the SJVAPCD guidance on impact analysis for GHGs are outdated; therefore, the methods used in South Coast Air Quality Management District (SCAQMD) which are more recent were used to evaluate significance of GHG impacts. Specifically, SCAQMD excludes emissions from sectors that are required to participate in the Cap-and-Trade Program administered by the California Air Resources Board (CARB) as discussed in the *Final Negative Declaration for Phillips 66 Los Angeles Refinery Carson Plant – Crude Oil Storage Project* (SCAQMD, 12/12/2014).[4] The Project would emit GHGs from fuel burned in vehicle engines and fuel burned in stationary equipment. Transportation fuel suppliers and importers are required to report emissions under the Cap-and-Trade which is designed to reduce GHG emissions as needed to achieve emissions reductions described in related planning documents which primarily consists of the AB 32 Scoping Plan. Thus, the emissions reductions will occur at a level in the supply chain above the Project which will have no choice but to use fuels with GHG intensities that are consistent with the Scoping Plan.

[4] http://www.aqmd.gov/home/research/documents-reports/lead-agency-permit-projects/permit-project-documents---year-2014

Table 45 Project GHG Emissions

Source	CO_2e (MT/yr)
Baseline Emissions	1,280
Project (Future Emissions) (Max Year)	2,283
Net change between baseline and Project (Project Emissions) (Max Year)	1,003
Screening Criteria (SCAQMD) Threshold	10,000
Will the Project Exceed SCAQMD Screening Criteria?	**No**

This information is provided for disclosure purposes. Emissions are a result of sources already regulated by the Scoping Plan.
Source: Appendix C.
Note: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds.

In summary, The GHGs associated with the Project would be consistent with the AB 32 Scoping Plan. Therefore, the Project impact on GHG emissions is less than significant. Additionally, for context, emissions from the Project are less than the SCAQMD GHG screening criteria.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not applicable.

4.0 ACRONYMS

AADT	average annual daily trips
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
ADJ_U*	adjusted friction velocity
ADL	annual dermal load
AERMET	AERMOD Meteorological Processor
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
APCO	Air Pollution Control Officer
AQCCIA	Air Quality and Climate Change Impact Assessment
ASF	age sensitivity factors
ATCM	airborne toxic control measure
ATS	American Thoracic Society
BACM	best available control measure
BACT	best available control technology
BAU	business-as-usual
BPS	best performance standard
BR	breathing rate
BW	body weight
CAAA	Clean Air Act Amendments
CAAQS	California ambient air quality standards
CAFE	corporate average fuel economy
CalEPA	California Environmental Protection Agency
CAP	climate action plan
CAPCOA	California Air Pollution Control Officers Association
CAT	Climate Action Team
CBE	Communities for a Better Environment
CCAA	California Clean Air Act
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPF	cancer potency factor
CPUC	California Public Utility Commission
CUPA	Certified Unified Permitting Agency
DPM	Diesel particulate matter
DWR	Department of Water Resources
FAH	fraction of time at home
FED	functionally equivalent document
FPMP	fugitive PM_{10} management plan
g/dscm	grams per dry standard cubic meter
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts

GLC	ground level concentration
GM	geometric mean
GRAF	gastrointestinal relative absorption fraction
gr/dscf	grains per dry standard cubic feet
GWP	global warming potential
HARP2	Hot Spots Analysis and Reporting Program
HFC	hydrofluorocarbon
HI	hazard index
hp	horsepower
HQ	hazard quotient
IPCC	International Panel on Climate Change
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LOAEL	lowest observed adverse effects level
MACT	maximum achievable control technology
MEIR	maximum exposed individual receptor
MEIW	maximum exposed individual worker
MPO	metropolitan planning organizations
MT	metric tonnes
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NMHC	non-methane hydrocarbons
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NOAEL	no observed adverse effects level
NSPS	New Source Performance Standards
NSR	New Source Review
NHTSA	National Highway Traffic Safety Administration
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
Pb	Lead
PCC	Portland cement concrete
PERP	Portable Equipment Registration Program
PFC	perfluorocarbon
PM	Particulate matter
PM_{10}	PM with aerodynamic diameter less than 10 microns
$PM_{2.5}$	PM with aerodynamic diameter less than 2.5 microns
PMI	point of maximum impact
RACM	reasonably available control measure
RCS	respirable crystalline silica
REL	reference exposure level
RICE	reciprocating internal combustion engine
SB	Senate Bill
SF_6	sulfur hexafluoride
SIP	state implementation plan

SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
TAC	toxic air contaminant
TCAG	Tulare County Association of Governments
tpy	tons per year
TVP	true vapor pressure
U.S.	United States
US EPA	United States Environmental Protection Agency
VDE	visible dust emissions
VMT	vehicle miles traveled
VOC	volatile organic compounds
WAF	worker adjustment factor
WRCC	Western Regional Climate Center

5.0 BIBLIOGRAPHY

American Thoracic Society. (2000). What Constitutes and Adverse Health Effect of Air Pollution? *American Journal of Respiratory and Critical Care Medicine*, 665-673. Retrieved from http://www.thoracic.org/statements/resources/archive/airpollution1-9.pdf

Berck, P. (2005, January). A Note on the Environmental Costs of Aggregates. *Working Paper No. 994*.

CalEPA. (2017, March 7). *Statewide Response to Climate Change.* Retrieved March 7, 2017, from California Climate Change: http://climatechange.ca.gov/state/

California Air Resources Board. (1988). *Instructions for the Emission Data System Review and Update Report.* Retrieved from https://www.arb.ca.gov/research/apr/reports/l657.pdf

California Department of Conservation, Division of Mines and Geology. (2000, August). *A General Location Guide for Ultramafic Rocks in California - Areas Likely to Contain Naturally Occuring Asbestos, 2000, Map scale 1:1,100,000.* Retrieved March 31, 2016, from Naturally-Occurring Asbestos - Publications & Maps: http://www.arb.ca.gov/toxics/asbestos/geninfo.htm

CAPCOA. (2013, July). California Emissions Estimator Model. *CalEEMod User's Guide*. (C. A. Association, Compiler) Sacramento, CA: ENVIRON International Corporation & California Air Districts.

CARB. (2007, Apirl 20). *Proposed Early Actions to Mitigate Climate Change in California.* Retrieved April 4, 2016, from Early Action Items: http://www.arb.ca.gov/cc/ccea/reports/reports.htm

CARB. (2008, December 11). *Climate Change Scoping Plan - a framework for change.* Retrieved April 4, 2016, from Initial AB 32 Climate Change Scoping Plan Document: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

CARB. (2011, August 19). *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document.* Retrieved April 3, 2016, from Scoping Plan: http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf

CARB. (2012). *Consolidated Table of OEHHA / ARB Approved Risk Assessment Values.* Retrieved from CARB: http://www.arb.ca.gov/toxics/healthval/healthval.htm

CARB. (2014, May 27). *2020 BAU Forecast.* Retrieved April 5, 2016, from 2020 Business-as-Usual (BAU) Emissions Projection 2014 Edition: http://www.arb.ca.gov/cc/inventory/data/tables/2020_bau_forecast_by_scoping_category_2014-05-22.pdf

CARB. (2014). *Area Designations Maps / State and National*. Retrieved from http://www.arb.ca.gov/desig/adm/adm.htm

CARB. (2014, May 21). *California Almanac of Emissions and Air Quality - 2013 Edition*. Retrieved from http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm

CARB. (2014, May 22). *First Update to the Climate Change Scoping Plan - Building on the Framework.* Retrieved April 4, 2016, from AB 32 Scopingt Plan: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm

CARB. (2014, April). *Miscellaneous Process Methodology 7.9 - Entrained Road Travel, Paved Road Dust.* Retrieved January 15, 2015, from CARB: http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2014.pdf

CARB. (2014, December). *Staff Report: Initial Statement of Reasons for Proposed Rulemaking.* Retrieved April 4, 2016, from Low Carbon Fuel Standard: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf

CARB. (2015, June 16). *California Greenhouse Gas Emissions for 2000 to 2013 – Trends of Emissions and Other Indicators.* Retrieved April 5, 2016, from California Greenhouse Gas Emission Inventory - 2015 Edition: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_trends_00-13%20_10sep2015.pdf

CARB. (2015, June). *California Greenhouse Gas Inventory for 2000-2013.* Retrieved April 5, 2016, from California Greenhouse Gas Emission Inventory - 2015 Edition: http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_sector_sum_2000-13_20150831.pdf

CARB. (2017, January 20). *The 2017 Climate Change Scoping Plan Update.* Retrieved May 1, 2017, from AB 32 Scoping Plan: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf

CARB. (2018, November 30). *PERP Regulation and Portable Engine ATCM*. Retrieved August 2021, from California Air Resources Board: https://ww2.arb.ca.gov/resources/documents/perp-regulation-and-portable-engine-atcm

CARB. (2020). *Air Quality Trends Summaries*. Retrieved February 23, 2016, from http://www.arb.ca.gov/adam/index.html

CARB. (2020). *California Greenhouse Gas Emissions for 2000 to 2018 - Trends of Emissions and Other Indicators.* Retrieved February 27, 2017, from California Greenhouse Gas Emission Inventory - 2020 Edition: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

CGS. (2018). *Map Sheet 52 - Aggregate Sustainability in California.* California Geologic Survey, Department of Conservation. Sacramento, CA: State of California. Retrieved from http://www.conservation.ca.gov/cgs/minerals/mlc/Pages/index.aspx

Climate Action Team. (2010, December). *Climate Action Team Reports.* Retrieved April 7, 2016, from California Cimate Change: http://www.climatechange.ca.gov/climate_action_team/reports/index.html#2010

County of Fresno. (2011, October 3). *Carmelita Mine & Reclamation Project Draft Environmental Impact Report.* Retrieved March 28, 2016, from Development Services Division: http://www.co.fresno.ca.us/DepartmentPage.aspx?id=44386

EPA. (1995). *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models - Volume I - User Instructions* (Vol. 1). Research Triangle Park, NC, USA. Retrieved March 31, 2016, from https://www3.epa.gov/ttn/scram/dispersion_alt.htm#isc3

EPA. (2006, November). *Section 13.2.2 - Unpaved Roads.* Retrieved from AP 42: http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

EPA. (2012). *US EPA Haul Road Workgroup Final Report Submission to EPA-OAQPS.* Research Triangle: EPA Haul Road Workgroup. Retrieved March 31, 2016, from http://www.epa.gov/ttn/scram/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf

EPA. (2013, March 22). *Clean Air Act in a Nutshell: How it Works.* Retrieved from https://www.epa.gov/sites/production/files/2015-05/documents/caa_nutshell.pdf

EPA. (2016, February 10). *Model Clearinghouse Review of the Use of the ADJ_U* Beta Option in the AERMET Meteorological Processor (Version 15181) for the Donlin Mine Compliance Demonstration.* Retrieved March 31, 2016, from Support Center for Regulatory Atmospheric Modeling (SCRAM): http://www3.epa.gov/ttn/scram/guidance/mch/new_mch/16-X-01_MCResponse_Region10_Donlin-02102016.pdf

OEHHA. (2003). *Air Toxics Hot Spots Program Risk Assessment Guidelines.* Guidance Manual, California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Oakland, CA. Retrieved from http://oehha.ca.gov/air/hot_spots/HRAguidefinal.html

OEHHA. (2004, June). *Recommendation for an Ambient Air Quality Standard for Ozone.* Retrieved May 13, 2016, from Review of the Ambient Air Quality Standard for Ozone: http://oehha.ca.gov/media/downloads/air/criteria-pollutant/ozonerec1.pdf

OEHHA. (2015, February). *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments.* Retrieved from http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html

OPR. (2000, October 26). Addressing Naturally Occuring Asbestos in CEQA Documents. *Memorandum: All CEQA Lead Agencies*. (C. &. CalDOC, Ed.) Sacramento, CA: State Clearinghouse.

Richards, J., & Brozell, T. (2007). *PM4 Crystalline Silica and PM10 Particulate Matter Emission Factors for Aggregate Producing Sources.* Coalition for the Responsible Regulation of Naturally Occurring Substances. Cary, NC: Air Control Techniques, P.C.

San Joaquin Valley Air Pollution Control District. (2012). *Recommended Thresholds of Significant Impact*. Retrieved from http://www.valleyair.org/transportation/ceqaanalysislevels.htm#thresholds

San Joaquin Valley Air Pollution Control District. (2015, March 19). *CEQA*. Retrieved from Valley Air: http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf

San Joaquin Valley Air Pollution Control District. (n.d.). *Ambient Air Quality Standards & Valley Attainment Status*. Retrieved from Valley Air: http://www.valleyair.org/aqinfo/attainment.htm#top

SCQAMD. (2008, December 8). *Greenhouse Gases (GHG) CEQA Significance Thresholds*. Retrieved October 21, 2021, from South Coast Air Quality Managment District: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ghg-significance-thresholds

SJVAPCD. (2002). *Guide for Assessing and Mitigation Air Quality Impacts.* Planning Division, Mobile Source/CEQA Section. Fresno, CA: San Joaquin Valley Air Pollution Control District.

SJVAPCD. (2009). *District Policy Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.* San Joaquin Valley Air Pollution Control District. Retrieved from http://www.valleyair.org/programs/CCAP/12-17-09/2%20CCAP%20-%20FINAL%20District%20Policy%20CEQA%20GHG%20-%20Dec%2017%202009.pdf

SJVAPCD. (2009, December 17). *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA.* Retrieved April 3, 2016, from CEQA Guidance Documents: http://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf

SJVAPCD. (2012, January 24). *APR 2015.* Retrieved April 4, 2016, from Zero Equivalency Policy for Greenhouse Gases: http://www.valleyair.org/policies_per/Policies/REVISEDAP2015.pdf

SJVAPCD. (2013, March 14). *Source Specific Policy 1610 - Aggregate Permit Processing.* Retrieved February 25, 2016, from http://www.valleyair.org/policies_per/Policies/SSP1610-AggregatePermitProcessing.pdf

SJVAPCD. (2014, June 25). *APR 2025.* Retrieved April 4, 2016, from CEQA Determinationsof Significance for Projects Subject to ARB's GHG :Cap and Trade Regulation: http://www.valleyair.org/policies_per/Policies/APR-2025.pdf

SJVAPCD. (2015, March 19). *GAMAQI.* Retrieved February 22, 2016, from http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf

SJVAPCD. (2015). *Guidance for Assessing and Mitigating Air Quality Impacts.* San Joaquin Valley Air Pollution Control District.

SJVAPCD. (2015, May 28). *Risk Management Policy for Permitting New and Modified Sources .* Retrieved February 22, 2016, from http://www.valleyair.org/policies_per/Policies/apr-1905.pdf

SJVAPCD. (2020). Retrieved 2020, from https://valleyair.org/aqinfo/attainment.htm

Tulare County. (2006, September). *Kaweah South Project RDEIR.*

Tulare County. (2012a, August 28). *Climate Action Plan.* Retrieved April 4, 2016, from General Plan 2030: http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/180Climate%20Action%20Plan/Climate%20Action%20Plan.pdf

Tulare County. (2012b, August 28). *General Plan 2030.* Retrieved April 4, 2016, from http://generalplan.co.tulare.ca.us/

U.S. EPA. (2013, November). *Greenhouse Gases Reporting Program Implementation.* Retrieved from https://www.epa.gov/sites/production/files/2014-09/documents/ghgrp-overview-factsheet.pdf

US EPA. (1974). *Development of Emission Factors for Fugitive Dust Sources.*

US EPA. (2006, November). *Section 13.2.2 Unpaved Roads.* Retrieved April 4, 2016, from AP 42 Compilation of Air Pollutant Emissions Factors: https://www3.epa.gov/ttn/chief/ap42/ch13/index.html

US EPA. (2011, January). *Section 13.2.1 Paved Roads.* Retrieved April 4, 2016, from AP 42, Fifth Edition, Volume I: https://www3.epa.gov/ttn/chief/ap42/ch13/index.html

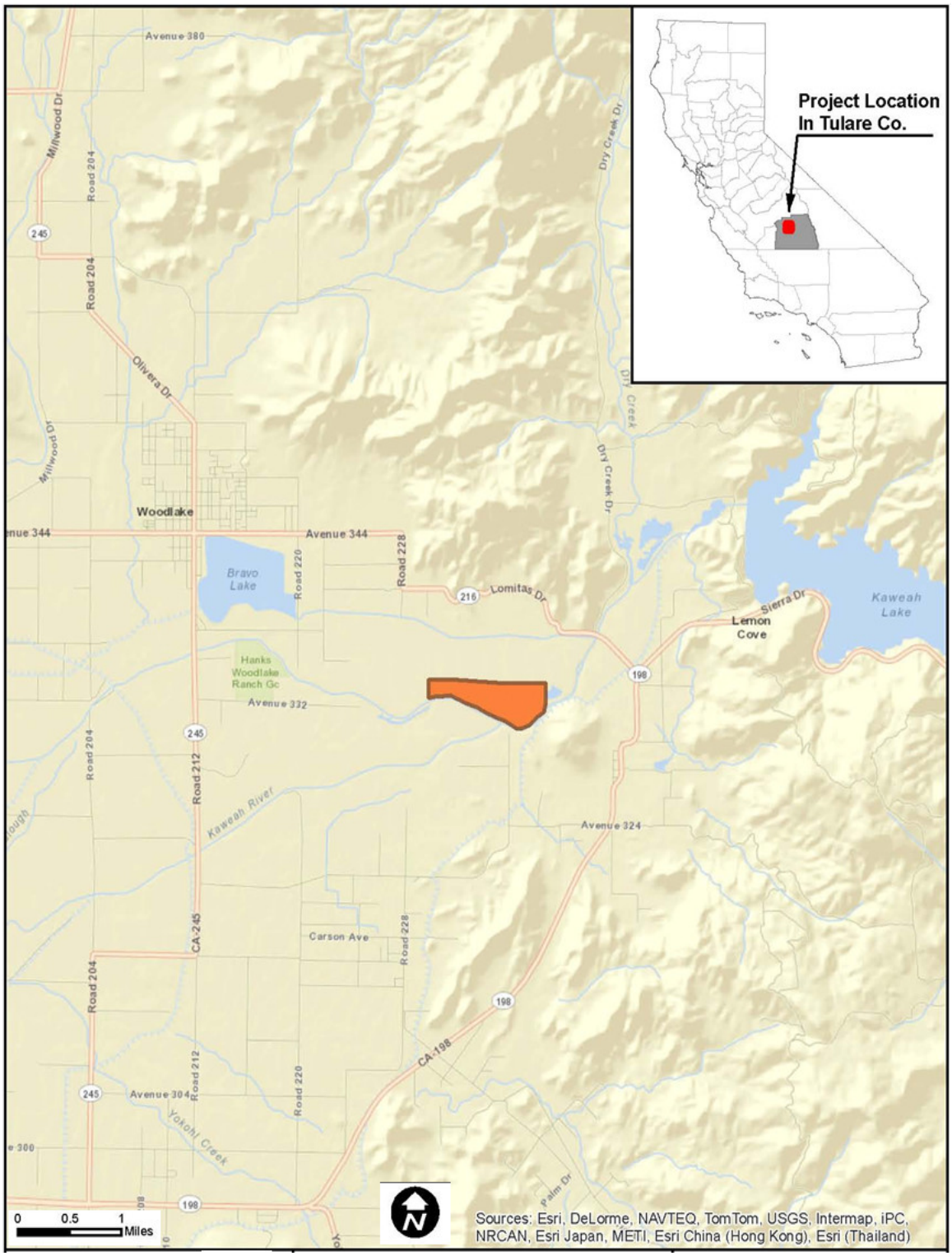
US EPA. (2014). *Green Book*. Retrieved from http://www.epa.gov/airquality/greenbook/index.html

US EPA. (2014). *Monitor Values Report*. Retrieved from EPA Air Data: http://www.epa.gov/airdata/ad_rep_mon.html

WRCC. (2015, January 20). *Period of Record Monthly Climate Summary for Lemon Cove, California (044890).* Retrieved March 28, 2016, from Cooperative Climatological Data Summaries: http://www.wrcc.dri.edu/climatedata/climsum/

APPENDIX A

FIGURES



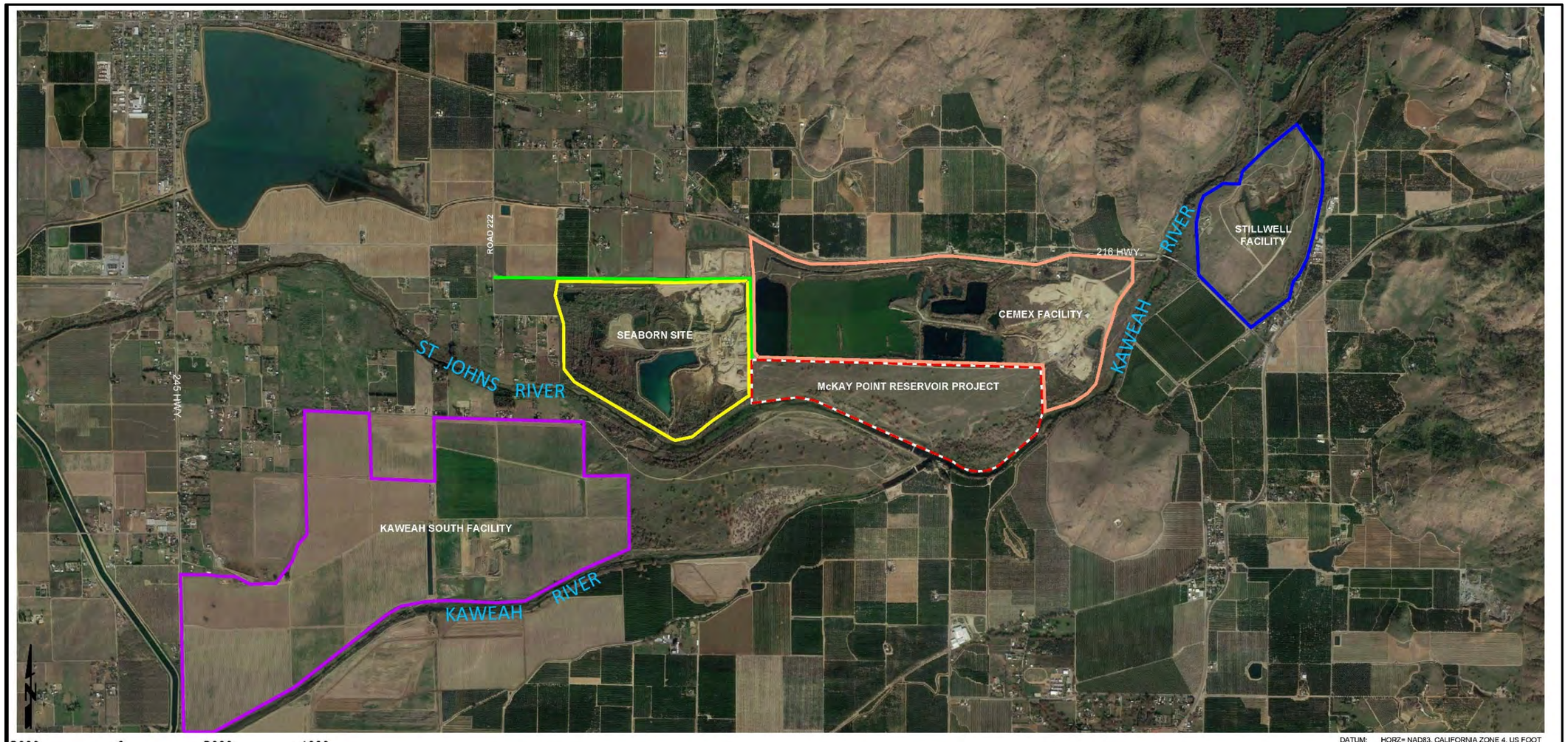
Project Site

N

Source:

SESPE CONSULTING, INC.

FIGURE 1	Site Location McKay Poinit Reservoir Project Tulare County, CA		
PROJECT #:	TU01	DATE:	2/25/16
SCALE:	as shown	DRAWN BY:	SDC



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(805) 275-1515 • www.sespeconsulting.com

McKAY POINT RESERVOIR PROJECT SITE AND SURROUNDING LAND USE

FIGURE NUMBER 2

DRAWN BY: G CAMUS
CHECKED BY: GS
DATE: JULY 2020

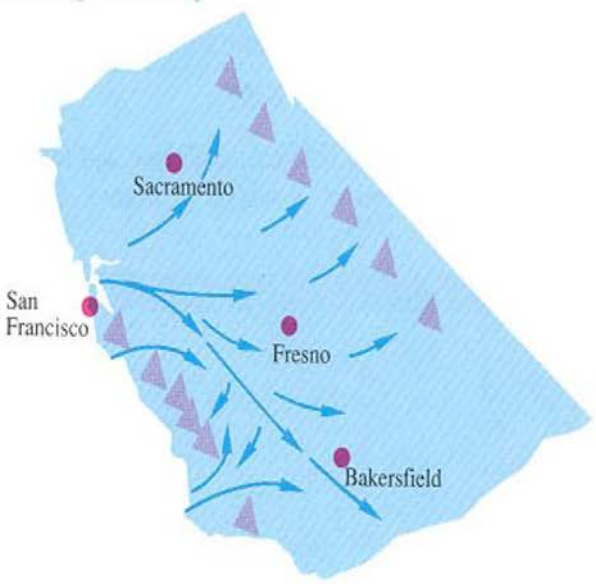


Source: Carmelita Mine DEIR (County of Fresno, 2011)

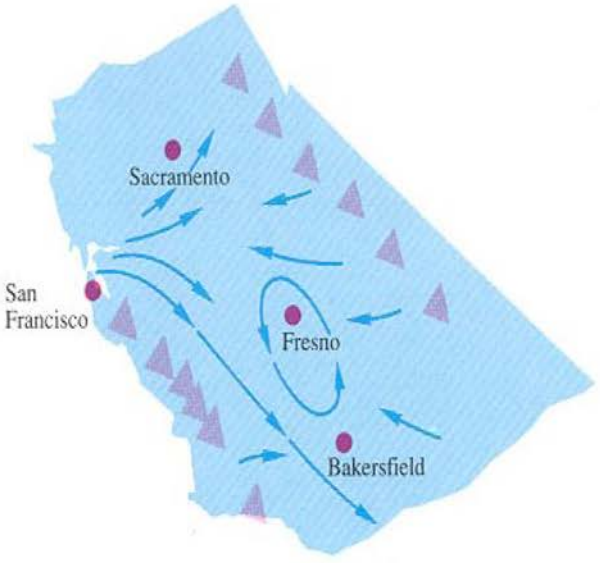
SESPE CONSULTING, INC.

FIGURE	Air Basin Boundaries
3	San Joaquin Valley, CA

PROJECT #:	TU01	DATE:	2/25/16
SCALE:	no scale	DRAWN BY:	SDC



Daytime Wind Flow Patterns



Nighttime Wind Flow Patterns

Source: San Joaquin Valley Air Basein Plan Demonstrating Attainment of Federal 1-hour Ozone Standards (Oct. 8, 2004)

N

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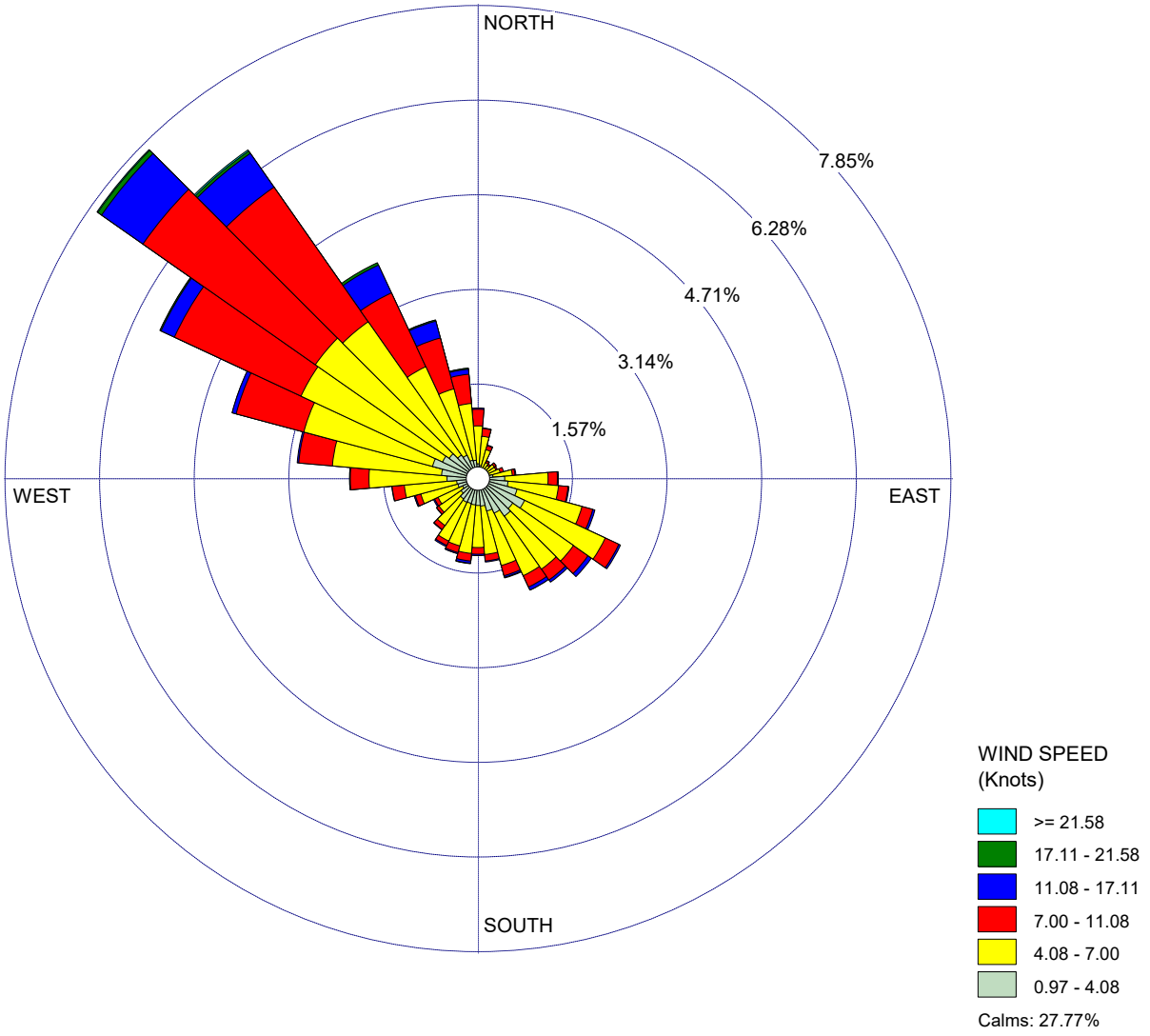
FIGURE 4	WIND PATTERNS DURING OZONE SEASON San Joaquin Valley Air Basin		
PROJECT #:	TU01	DATE:	2/25/16
SCALE:	no scale	DRAWN BY:	SDC

WIND ROSE PLOT:

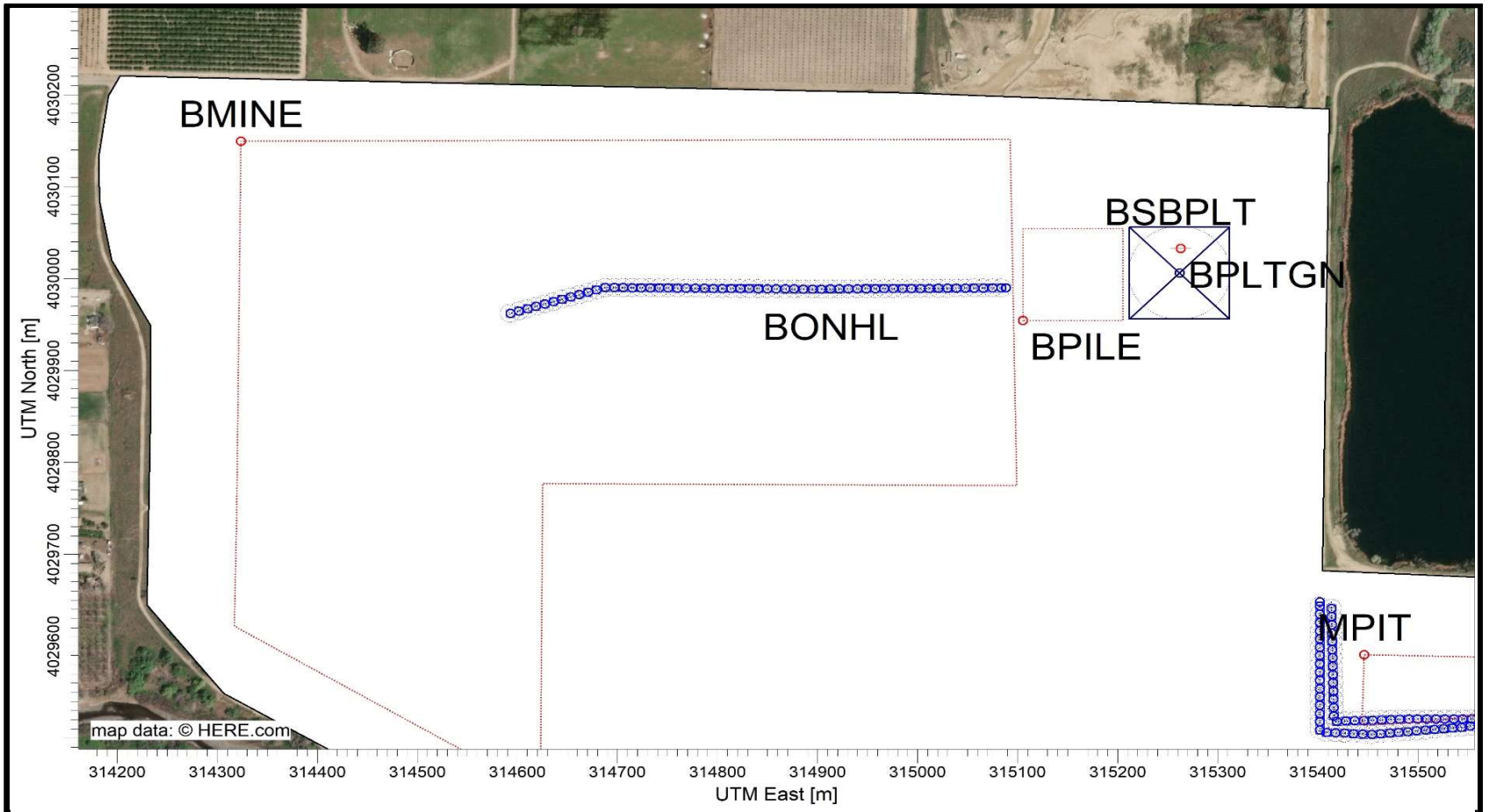
Figure 5
McKay Point Reservoir Project, Tulare Irrigation District

DISPLAY:

Wind Speed
Direction (blowing from)



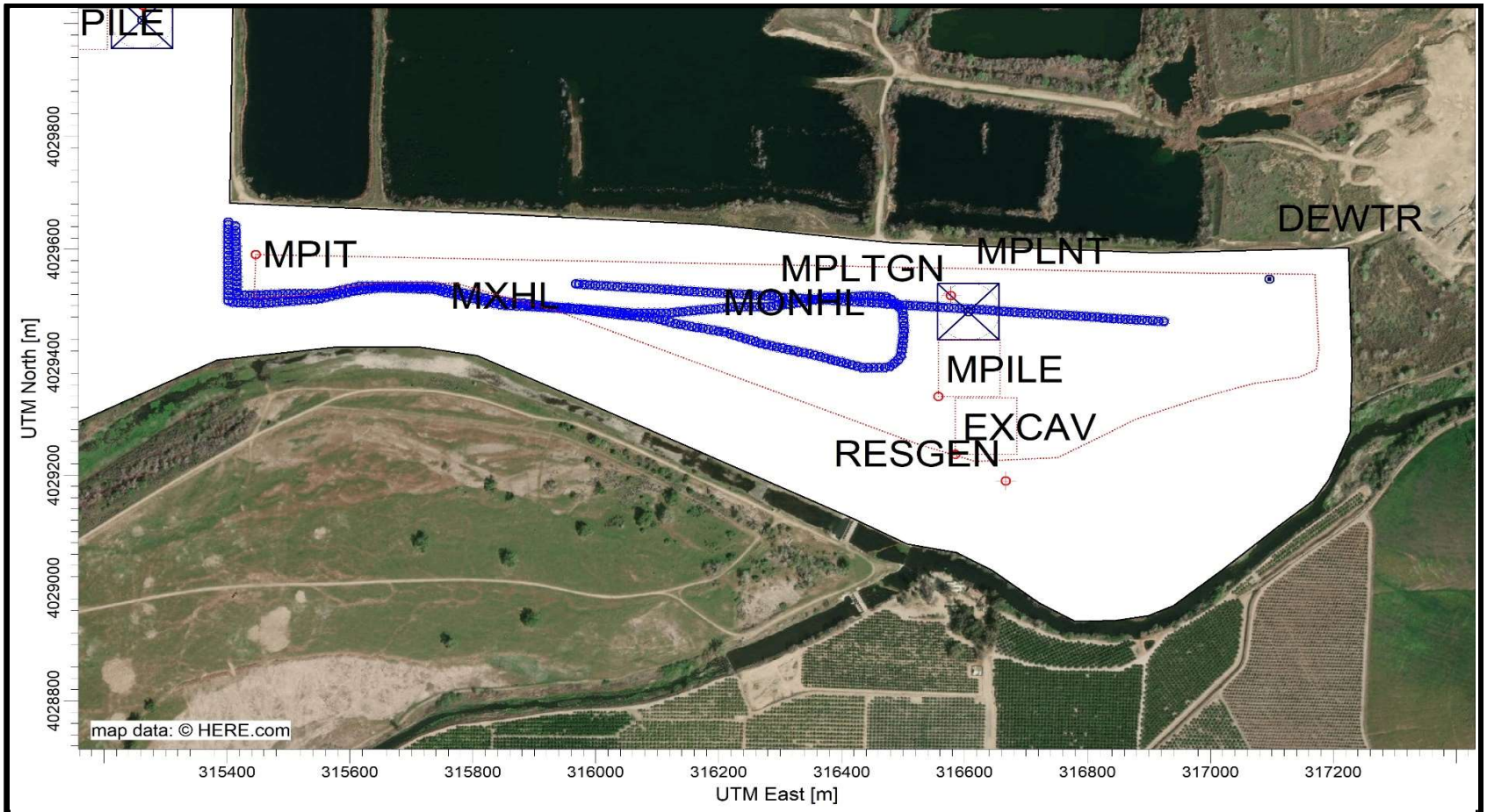
COMMENTS: Source: SJVAPCD	DATA PERIOD: **Start Date: 1/1/2007 - 00:00** **End Date: 12/31/2010 - 23:59**	COMPANY NAME: **Sespe Consulting**	
		MODELER: **ADA**	
	CALM WINDS: **27.77%**	TOTAL COUNT: **68898 hrs.**	
	AVG. WIND SPEED: **4.39 Knots**	DATE: **3/4/2021**	PROJECT NO.: **TU01**



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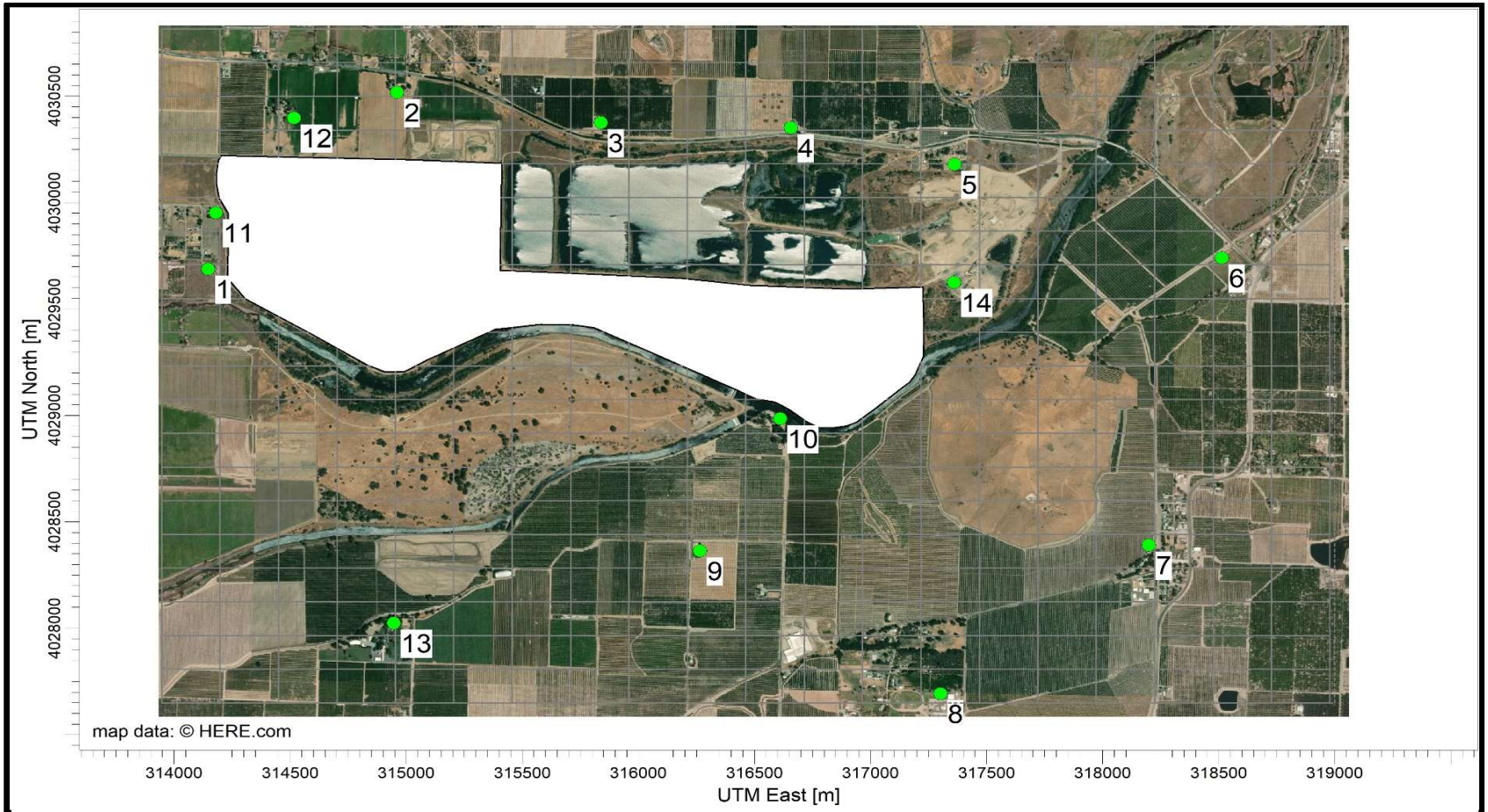
FIGURE	Baseline Model Sources
6a	McKay Point Reservior Project Tulare Irrigation District Tulare County, California

PROJECT #:	TU01.20.10	DATE:	3/4/21
SCALE:	SHOWN	DRAWN BY:	ADA



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FIGURE	McKay Site Model Sources McKay Point Reservior Project Tulare Irrigation District Tulare County, California		
6b			
PROJECT #:	TU01.20.10	DATE:	3/4/21
SCALE:	SHOWN	DRAWN BY:	ADA



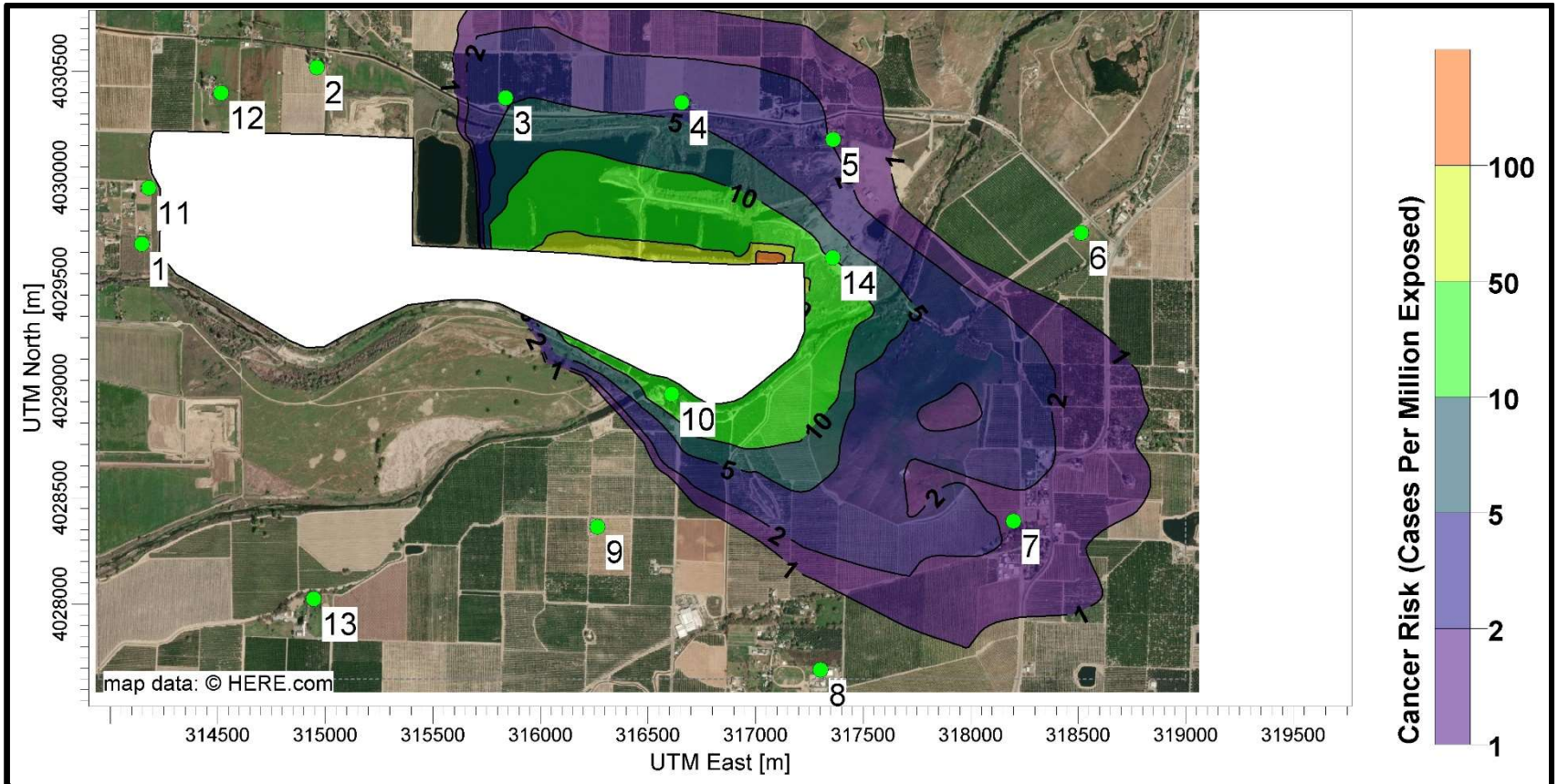
Grey Lines Represent Cartesian Receptor Grid

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FIGURE 7

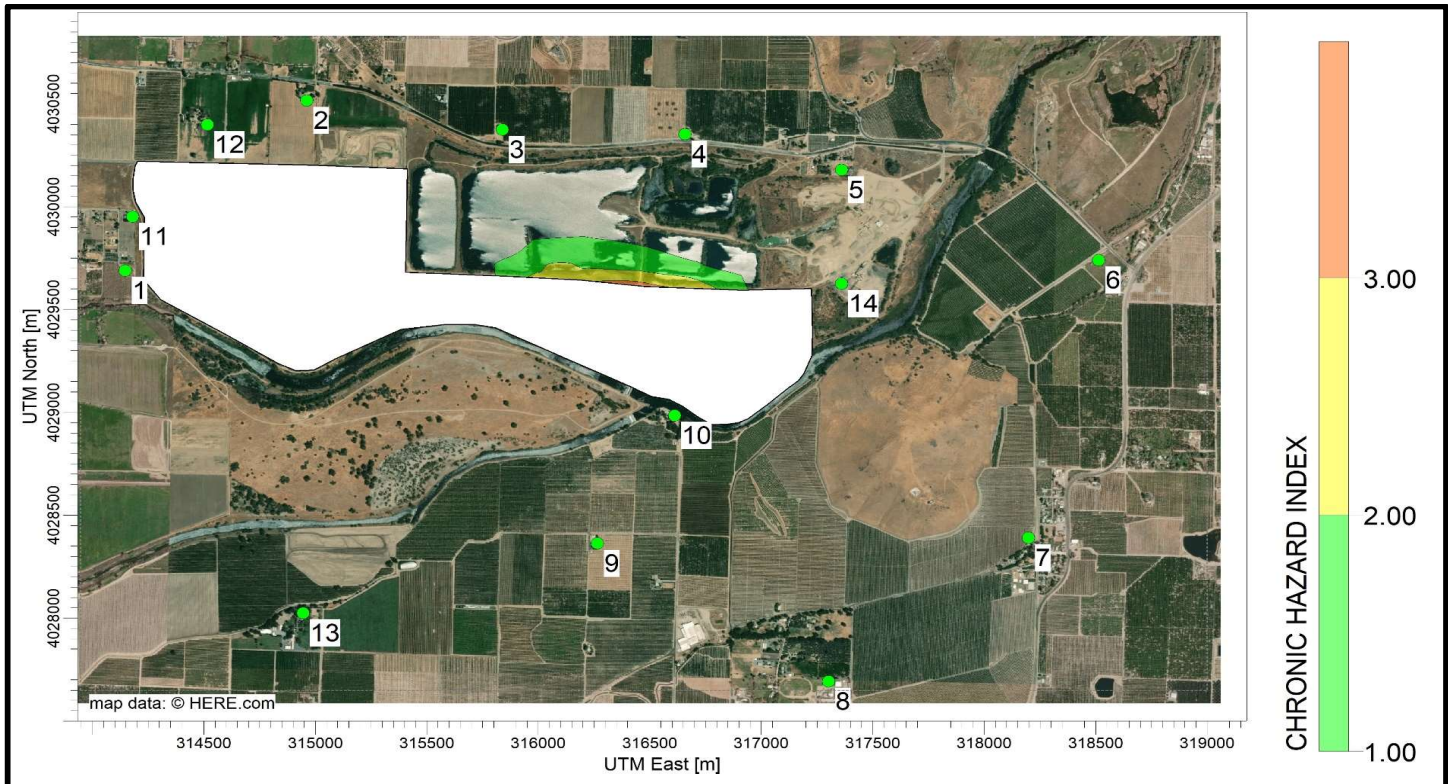
AERMOD Model Receptors
McKay Point Reservior Project
Tulare Irrigation District
Tulare County, California

PROJECT #:	TU01.20.10	DATE:	3/4/21
SCALE:	SHOWN	DRAWN BY:	ADA



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FIGURE 8	Cancer Risk Isopleth McKay Point Reservior Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.10	DATE:	8/18/21
SCALE:	SHOWN	DRAWN BY:	ADA



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FIGURE 9	Chronic Hazard Index Isopleth McKay Point Reservior Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.10	DATE:	3/4/21
SCALE:	SHOWN	DRAWN BY:	ADA

APPENDIX B

BACKGROUND INFORMATION

Appendix B
Characteristics of Air Pollutants

Ozone: Ozone (smog) is formed by photochemical reactions between oxides of nitrogen (NO_X) and volatile organic compounds (VOC), rather than being directly emitted. The San Joaquin Valley Air Pollution Control District (SJVAPCD) Health-Based Implementation Strategy prioritizes NOx reductions over VOC reductions because NOx reductions would have greater effect on reducing ozone concentrations and be more protective of public health.

O_3 is a pungent, colorless gas typical of photochemical smog. Elevated O_3 concentrations may result in reduced lung function, particularly during vigorous physical activity. This health effect is particularly acute in sensitive receptors such as the sick, the elderly, and young children. O_3 levels peak during summer and early fall.

Breathing ground-level ozone can result in a number of health effects that are observed in broad segments of the population. Some of these effects include:

- Induction of respiratory symptoms;
- Decrements in lung function; and
- Inflammation of airways.

Respiratory symptoms can include:

- Coughing;
- Throat irritation;
- Pain, burning, or discomfort in the chest when taking a deep breath; and
- Chest tightness, wheezing, or shortness of breath.

In addition to these effects, evidence from observational studies indicates that higher daily ozone concentrations are associated with increased asthma attacks, increased hospital admissions, increased daily mortality, and other markers of morbidity. The consistency and coherence of the evidence for effects upon asthmatics suggests that ozone can make asthma symptoms worse and can increase sensitivity to asthma triggers.

Carbon Monoxide: Carbon monoxide (CO) is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to central nervous system functions.

The severity of symptoms due to CO exposure increases with the blood carboxyhemoglobin (COHb) level. The first signs of CO exposure include mild headache and breathlessness with moderate exercise. Continued exposure may lead to more severe headache, irritability, impaired judgment and memory, and rapid onset of fatigue.

Persons with cardiovascular disease, including those with angina, persons with chronic obstructive pulmonary disease, persons with anemia, and fetuses of pregnant women may be more sensitive to the adverse effects of carbon monoxide exposure. The fetuses of pregnant women, especially those expectant mothers exercising vigorously, may be especially vulnerable due to the much higher affinity of fetal hemoglobin for CO compared to adult hemoglobin.

Persons exposed to methylene chloride are more sensitive to the effects of CO exposure because CO is a metabolite of methylene chloride. Smokers may experience an additional burden of COHb since their carboxyhemoglobin levels are already elevated by smoking.

Nitrogen Oxides: Nitrogen dioxide is a generic term for the mono-nitrogen oxides which include nitric oxide (NO) and NO_2. NO is a colorless, odorless gas and NO_2 is a reddish-brown gas. NO_X is formed from fuel combustion under high temperature or pressure. NO_X is a primary component of the photochemical smog reaction. It also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition (i.e., acid rain). NO_X decreases lung function and may reduce resistance to infection.

Acute exposure to NO_2 may cause pulmonary edema, pneumonitis, and bronchitis. NO_2 is considered a relatively insoluble, reactive gas, such as phosgene and ozone. Once inhaled, NO_2 reaches the lower respiratory tract, affecting mainly the bronchioles and the adjacent alveolar spaces, where it may produce pulmonary edema within hours.

Sulfur Dioxide: Sulfur dioxide is a colorless, irritating gas formed primarily from combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

Both controlled laboratory studies and epidemiology studies have shown that people with asthma and children are particularly sensitive to and are at increased risk from the effects of SO_2 air pollution. Asthmatic subjects exposed to levels of SO_2 within regulatory standards have demonstrated increased respiratory symptoms such as shortness of breath, coughing and wheezing, and decrements in lung function.

Lead: Lead (Pb) was phased out of use in gasoline and paint. It is present at trace concentrations in a variety of other materials including most natural materials extracted from the earth's crust. Once in the bloodstream, Pb can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of Pb.

Particulate Matter: Particulate matter (PM) pollution consists of very small liquid and solid particles floating in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials

that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. PM_{10} refers to particles less than or equal to 10 microns in aerodynamic diameter. $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM_{10}.

There are sources of PM_{10} in both urban and rural areas. PM_{10} and $PM_{2.5}$ are emitted from stationary and mobile sources, including diesel trucks and other motor vehicles, power plants, industrial processing, wood burning stoves and fireplaces, wildfires, dust from roads, construction, landfills, and agriculture, and fugitive windblown dust. Because particles originate from a variety of sources, their chemical and physical compositions vary widely.

PM_{10} and $PM_{2.5}$ particles are small enough to be inhaled into, and lodge in, the deepest parts of the lung, evading the respiratory system's natural defenses. Health problems may occur as the body reacts to these foreign particles.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. PM_{10} and $PM_{2.5}$ can aggravate respiratory disease, and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM_{10}. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM_{10} exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM_{10} can also damage manmade materials and is a major cause of reduced visibility in many parts of the U.S.

Respirable Crystalline Silica: Respirable Crystalline Silica (RCS) means crystalline silicon dioxide with aerodynamic diameter less than four microns (0.0004 cm). Crystalline silica or quartz is ubiquitous in nature. Most dust generated by construction and mining activities including blasting produces dust particles larger than 4 microns. These particles are too large reach alveoli of the lungs which are the target organ. Thus, RCS constitutes a tiny fraction of the dust from these sources and does not represent a significant health risk to neighbors of these types of projects. In order to result in toxic effects, the silica needs to be crystalline, smaller than 4 microns, inhaled, and not exhaled.

Inhalation of RCS initially causes respiratory irritation and an inflammatory reaction in the lungs. Silicosis results from chronic exposure; it is characterized by the presence of histologically unique silicotic nodules and by fibrotic scarring of the lung. Lung diseases other than cancer associated with silica exposure include silicosis, tuberculosis/silicotuberculosis, chronic bronchitis, small airways disease, and

emphysema. Ambient air exposures do not cause concern but levels to which workers (e.g., miners, sandblasters) may be exposed have been shown to cause cancer.

Acute exposures to high concentrations cause cough, shortness of breath, and pulmonary alveolar lipoproteinosis (acute silicosis). In a report on the hazards of exposure to crystalline silica, the American Thoracic Society (1997) stated: "Studies from many different work environments suggest that exposure to working environments contaminated by silica at dust levels that appear not to cause roentgenographically visible simple silicosis can cause chronic airflow limitation and/or mucus hypersecretion and/or pathologic emphysema." Other researchers also concluded that "chronic levels of silica dust that do not cause disabling silicosis may cause the development of chronic bronchitis, emphysema, and/or small airways disease that can lead to airflow obstruction, even in the absence of radiological silicosis." Fibrotic lesions associated with crystalline silica have also been found at autopsy in the lungs of granite workers who lacked radiological evidence of silicosis (OEHHA, 2004).

Silicosis results from chronic exposure; it is characterized by the presence of histologically unique silicotic nodules and by fibrotic scarring of the lung. Lung diseases other than cancer associated with silica exposure include silicosis, tuberculosis/silicotuberculosis, chronic bronchitis, small airways disease, and emphysema. Silica exposure has been implicated in autoimmune diseases (rheumatoid arthritis, scleroderma, systemic lupus erythematosus) in gold miners and granite workers and in the causation of kidney disease in some occupations, possibly by an immune mechanism (OEHHA, 2004).

Diesel Particulate Matter: Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer.

Long-term exposure to diesel exhaust particles poses the highest cancer risk of any toxic air contaminants (TAC) evaluated by the California Office of Environmental Health Hazard Assessment (OEHHA). The California Air Resources Board (CARB) has estimated that about 70 percent of the cancer risk that the average Californian faces from breathing TACs stems from diesel exhaust particles. In a comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers, and equipment operators. The studies showed these workers were more likely than workers who were not exposed to diesel emissions to develop lung cancer. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer.

Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated similar cancer risks from diesel exhaust as those calculated by OEHHA and CARB.

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials

to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among people suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can reduce lung function in children.

Appendix B
Greenhouse Gases – Characteristics of Climate Pollutants & Regulatory Setting

1.1 Regulatory Section

1.1.1 Characteristics of Climate Pollutants

The accumulation of greenhouse gases (GHGs) in the atmosphere contributes to the regulation of the earth's temperature. Some GHGs can remain in the atmosphere for long periods of time (i.e., long-lived). There are six GHGs recognized under the Kyoto Protocol and have been found by the International Panel on Climate Change (IPCC) to have a "Long-lived" effect on global climate change. In addition, California has identified "short-lived" climate pollutants. These are described below. The primary one associated with the Project are Nitrous Oxides (N_2O).

1.1.1.1 Long-Lived Climate Pollutants

In general, there are six (6) compounds/classes of GHGs that are counted when emissions are inventoried. Each GHG exhibits a different global warming potential (GWP). The mass of emissions of each GHG is multiplied by its GWP to determine the carbon dioxide equivalent (CO_2e) potential for global warming. GWPs have changed over time by the Intergovernmental Panel on Climate Change (IPCC) which is considered an authority on GHGs and their effects. The CAP and CARB emissions inventories and plans use GWPs that are an iteration or two behind and the most recent IPCC publication. Characteristics of each long-lived GHG and the associated GWP is presented below.

Carbon Dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include burning coal, oil, natural gas, and wood. By definition, CO_2 has a GWP equal to one (1).

Methane (CH_4) is a flammable GHG. A natural source of CH_4 is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH_4, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle. CH_4 has a GWP equal to 28.

Nitrous Oxide (N_2O) is a colorless GHG. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O has a GWP equal to 265.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for chlorofluorocarbons (CFCs). Of all the GHGs, they are one of three groups with the highest global warming potential. HFCs are human made for applications such as air conditioners and refrigerants. HFCs have GWPs that range from 124 (HFC 125a) to 14,300 (HFC 23).

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. PFCs have GWPs that range from 7,390 (PFC 14) to 12,200 (PFC 116).

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection. SF_6 has a GWP equal to 22,800.

1.1.1.2 Short-Lived Climate Pollutants

Short-lived climate pollutants are climate forcers that remain in the atmosphere for a much shorter period of time than longer-lived climate pollutants, such as carbon dioxide (CO_2). Their relative potency, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2. The impacts of short-lived climate pollutants are especially strong over the short term. Reducing these emissions can make an immediate beneficial impact on climate change.

Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Diesel particulate matter (DPM) emissions are a major source of black carbon and are also toxic air contaminants that have been regulated and controlled in California for several decades in order to protect public health.

Fluorinated gases (F-gases) are the fastest growing source of greenhouse gas emissions in California and globally. They include ozone-depleting substances that are being phased out globally under the Montreal Protocol, and their primary substitute, hydrofluorocarbons (HFCs). Most F-gas emissions come from leaks of these gases in refrigeration and air-conditioning systems. Emissions also come from aerosol propellants, fire suppressants, and foam-expansion agents.

1.1.2 Federal

To date, there is no federal overarching law specifically related to climate change or the reduction of GHGs. The Environmental Protection Agency (EPA) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA,* 549 US 497 (2007). The Supreme Court found that GHGs are air pollutants covered by the Clean Air Act, and the EPA Endangerment Findings concluded the elements CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 threatened public health for both current and future generations. In 2009, the U.S. EPA published a rule for the mandatory reporting of GHG from sources that in general emit 25,000 metric tons or more of carbon dioxide equivalent per year in the United States. Implementation of 40 CFR Part 98 is referred to as the Greenhouse Gas Reporting Program (GHGRP). This collection of comprehensive, nationwide emissions data is intended to provide a better understanding of the sources of GHGs and to guide development of policies and programs to reduce emissions. (U.S. EPA,

2013) Additional federal actions have included the implementation of standards for vehicles, biofuel production, and power generation. Federal actions relating to GHG emissions are summarized and provided in Table 1 below.

Table 1 – Federal Actions Relating to GHG Emissions

Date	Action	Description
April 2, 2007	*Massachusetts v. EPA*, 549 U.S. 497	Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. (528-29.)
September 22, 2009	Mandatory Reporting Rule	This rule and subsequent rules which amend 40 CFR Part 98 require and govern the collection accurate and timely data on GHG emissions that can be used to inform future policy decisions.
December 7, 2009	EPA Endangerment Findings	• Elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding." • Combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding." (*Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act* (Dec. 15, 2009) 74 Fed. Reg. 66496, 546.)
December 19, 2007	Energy Independence and Security Act (EISA)	• Increase the supply of alternative fuel sources by requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. • Set a target of 35 miles per gallon (mpg) for the combined fleet of cars and light trucks by model year 2020 and establish a fuel economy program for medium and heavy duty vehicles. • Prescribe or revise standards affecting regional efficiency for heating and cooling products.
April 2010, September 2011, and August 2012	EPA and NHTSA Joint Final Rules for Vehicle Standards	• In 2010, established a National program consisting of new standards for light-duty vehicles model years 2012 through 2016 which achieve the 250 g CO_2/mile (35 mpg) target in the EISA beginning with the 2016 model year fleet. • In 2011, approved GHG emissions standards for medium and heavy duty trucks model years 2014 through 2018. • In 2012, approved standards for model year 2017 and beyond light duty vehicles to 163 g CO_2/mile (i.e., 54.5 mpg if achieved only by fuel efficiency) for model year 2025.
January 2, 2011	Clean Air Act Permitting for GHGs	On June 23, 2014, the U.S. Supreme Court issued its decision in Utility Air Regulatory Group v. EPA, 134 S. Ct. 2427 (2014) ("UARG"). The Court held that EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT).

Date	Action	Description
August 3, 2015	Clean Power Plan	The Plan provides standards for power plants, customized goals for states to cut the carbon pollution from power plants, national consistency, accountability and a level playing field while reflecting each state's energy mix. On February 9, 2016, the Supreme Court stayed implementation of the Clean Power Plan pending judicial review. EPA claims "The Court's decision was not on the merits of the rule. EPA firmly believes the Clean Power Plan will be upheld when the merits are considered because the rule rests on strong scientific and legal foundations."

1.1.3 State

The following tables were copied from the California government website for climate change (climatechange.ca.gov) and list the California legislation (Table 2), regulations, (Table 3), and executive orders (Table 4) through 2018. More recent developments are discussed immediately following the tables.

Table 2 – California Climate Change Legislation

Date	Legislation	Description
September 10, 2018	Senate Bill 100 (De León, Chapter 312, Statues of 2018)	California Renewables Portfolio Standard Program: emissions of greenhouse gases. This bill establishes the 100 Percent Clean Energy Act of 2017 which increases the Renewables Portfolio Standard (RPS) requirement from 50 percent by 2030 to 60 percent, and creates the policy of planning to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.
July 26, 2017	Assembly Bill 617 (Christina Garcia, Chapter 136, Statutes of 2017)	Companion to Cap-and-Trade Extension Establishes a groundbreaking program to measure and reduce air pollution from mobile and stationary sources at the neighborhood level in the communities most impacted by air pollutants. Requires the Air Resources Board to work closely with local air districts and communities to establish neighborhood air quality monitoring networks and to develop and implement plans to reduce emissions. The focus on community-based air monitoring and emission reductions will provide a national model for enhanced community protection.
July 25, 2017	Assembly Bill 398 (Eduardo Garcia, Chapter 135, Statutes of 2017)	Cap-and-Trade Extension Extends and improves the Cap and Trade Program, which will enable the state to meet its 2030 emission reduction goals in the most cost-effective manner. Furthermore, extending the Cap and Trade Program will provide billions of dollars in auction proceeds to invest in communities across California.

Date	Legislation	Description
September 19, 2016	Senate Bill 1383 (Lara, Chapter 395, Statutes of 2016)	Short-lived Climate Pollutants Establishes statewide reduction targets for short-lived climate pollutants.
September 8, 2016	Assembly Bill 197 (Eduardo Garcia, Chapter 250, Statutes of 2016)	Greenhouse gas regulations Prioritizes direct emission reductions from large stationary sources and mobile sources.
September 8, 2016	Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)	Greenhouse Gas emission reduction target for 2030 Establishes a statewide greenhouse gas (GHG) emission reduction target of 40 percent below 1990 levels by 2030.
October 7, 2015	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)	Clean Energy and Pollution Reduction Act of 2015 Establishes targets to increase retail sales of renewable electricity to 50 percent by 2030 and double the energy efficiency savings in electricity and natural gas end uses by 2030.
September 21, 2014	Senate Bill 605 (Lara, Chapter 523, Statutes of 2014)	Short-lived climate pollutants Requires the State Air Resources Board to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016.
September 21, 2014	Senate Bill 1275 (De León, Chapter 530, Statutes of 2014)	Charge Ahead California Initiative Establishes a State goal of 1 million zero-emission and near-zero-emission vehicles in service by 2020. Amends the enhanced fleet modernization program to provide a mobility option. Establishes the Charge Ahead California Initiative requiring planning and reporting on vehicle incentive programs and increasing access to and benefits from zero-emission vehicles for disadvantaged, low-income, and moderate-income communities and consumers.
September 21, 2014	Senate Bill 1204 (Lara, Chapter 524, Statutes of 2014)	California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program Creates the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program funded by the Greenhouse Gas Reduction Fund for development, demonstration, precommercial pilot, and early commercial deployment of zero- and near-zero emission truck, bus, and off-road vehicle and equipment technologies, with priority given to projects benefiting disadvantaged communities.

Date	Legislation	Description
September 28, 2013	Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013)	Alternative fuel and vehicle technologies: funding programs Extends until January 1, 2024, extra fees on vehicle registrations, boat registrations, and tire sales in order to fund the AB 118, Carl Moyer, and AB 923 programs that support the production, distribution, and sale of alternative fuels and vehicle technologies and air emissions reduction efforts. The bill suspends until 2024 ARB's regulation requiring gasoline refiners to provide hydrogen fueling stations and appropriates up to $220 million, of AB 118 money to create a hydrogen fueling infrastructure in the State.
September 28, 2013	Assembly Bill 1092 (Levine, Chapter 410, Statutes of 2013)	Building standards: electric vehicle charging infrastructure Requires the Building Standards Commission to adopt mandatory building standards for the installation of future electric vehicle charging infrastructure for parking spaces in multifamily dwellings and nonresidential development.
September 30, 2012	Senate Bill 535 (De León, Chapter 830, Statutes of 2012)	Greenhouse Gas Reduction Fund and Disadvantaged Communities Requires the California Environmental Protection Agency to identify disadvantaged communities; requires that 25% of all funds allocated pursuant to an investment plan for the use of moneys collected through a cap-and-trade program be allocated to projects that benefit disadvantaged communities and 10 those 25% be use within disadvantaged communities; and requires the Department of Finance to include a description of how these requirements are fulfilled in an annual report.
September 30, 2012	Assembly Bill 1532 (J. Perez, Chapter 807, Statutes of 2012)	Greenhouse Gas Reduction Fund in the Budget Requires the Department of Finance to develop and submit to the Legislature an investment plan every three years for the use of the Greenhouse Gas Reduction Fund; requires revenue collected pursuant to a market-based compliance mechanism to be appropriated in the Annual Budget Act; requires the department to report annually to the Legislature on the status of projects funded; and specifies that findings issued by the Governor related to "linkage" as part of a market-base compliance mechanism are not subject to judicial review.
April 12, 2011	Senate Bill X1-2 (Simitian, Chapter 1, Statutes of 2011)	Governor Edmund G. Brown, Jr. signed Senate Bill X1-2 into law to codify the ambitious 33 percent by 2020 goal. SBX1-2 directs California Public Utilities Commission's Renewable Energy Resources Program to increase the amount of electricity generated from eligible renewable energy resources per year to an amount that equals at least 20% of the total electricity sold to retail customers in California per year by December 31, 2013, 25% by December 31, 2016 and 33% by December 31, 2020. The new RPS goals applies to all electricity retailers in the State including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. This new RPS preempts the California Air Resources Boards' 33 percent Renewable Electricity Standard.
September 29, 2011	Assembly Bill 1504 (Skinner, Chapter 534, Statutes of 2010)	Forest resources and carbon sequestration. Bill requires Department of Forestry and Fire Protection and Air Resources Board to assess the capacity of its forest and rangeland regulations to meet or exceed the State's greenhouse goals, pursuant to AB 32.

Date	Legislation	Description
September 30, 2008	Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008)	Sustainable Communities & Climate Protection Act of 2008 requires Air Resources Board to develop regional greenhouse gas emission reduction targets for passenger vehicles. ARB is to establish targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations. For more information on SB 375, see the ARB Sustainable Communities page.
October 14, 2007	Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007)	Alternative Fuels and Vehicles Technologies The bill would create the Alternative and Renewable Fuel and Vehicle Technology Program, to be administered by the Energy Commission, to provide funding to public projects to develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the State's climate change policies.
August 24, 2007	Senate Bill 97 (Dutton, Chapter 187, Statutes of 2007)	Directs Governor's Office of Planning and Research to develop CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." For more information see the OPR CEQA and Climate Change page.
July 18. 2006	Assembly Bill 1803 (Committee on Budget, Chapter 77, Statutes of 2006)	Greenhouse gas inventory transferred to Air Resources Board from the Energy Commission.
August 21, 2006	Senate Bill 1 (Murray, Chapter 132, Statutes of 2006)	California's Million Solar Roofs plan is enhanced by PUC and CEC's adoption of the California Solar Initiative. SB1 directs PUC and CEC to expand this program to more customers, and requiring the State's municipal utilities to create their own solar rebate programs. This bill would require beginning January 1, 2011, a seller of new homes to offer the option of a solar energy system to all customers negotiating to purchase a new home constructed on land meeting certain criteria and to disclose certain information.
September 26, 2006	Senate Bill 107 (Simitian, Chapter 464, Statutes of 2006)	SB 107 directs California Public Utilities Commission's Renewable Energy Resources Program to increase the amount of renewable electricity (Renewable Portfolio Standard) generated per year, from 17% to an amount that equals at least 20% of the total electricity sold to retail customers in California per year by December 31, 2010.
September 27, 2006	Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006)	California Global Warming Solutions Act of 2006. This bill would require Air Resources Board (ARB) to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. ARB shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program. AB 32 directs Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 to continue its role in coordinating overall climate policy. See more information on AB 32 at ARB.

Date	Legislation	Description
September 12, 2002	Senate Bill 1078 (Sher, Chapter 516, Statutes of 2002)	This bill establishes the California Renewables Portfolio Standard Program, which requires electric utilities and other entities under the jurisdiction of the California Public Utilities Commission to meet 20% of their renewable power by December 31, 2017 for the purposes of increasing the diversity, reliability, public health, and environmental benefits of the energy mix.
September 7, 2002	Senate Bill 812 (Sher, Chapter 423, Statutes of 2002)	This bill added forest management practices to the California Climate Action Registry members' reportable emissions actions and directed the Registry to adopt forestry procedures and protocols to monitor, estimate, calculate, report, and certify carbon stores and carbon dioxide emissions that resulted from the conservation-based management of forests in California.
July 22, 2002	Assembly Bill 1493 (Pavley, Chapter 200, Statutes of 2002)	The "Pavley" bill requires the registry, in consultation with ARB, to adopt procedures and protocols for the reporting and certification of reductions in greenhouse gas emissions from mobile sources for use by the ARB in granting the emission reduction credits. This bill requires the ARB to develop and adopt, by January 1, 2005, regulations that achieve the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks. For more information on AB 1493 Pavley I, see the ARB Clean Car Standards page.
October 11, 2001	Senate Bill 527 (Sher, Chapter 769, Statutes of 2001)	This bill revises the functions and duties of the California Climate Action Registry and requires the Registry, in coordination with CEC to adopt third-party verification metrics, developing GHG emissions protocols and qualifying third-party organizations to provide technical assistance and certification of emissions baselines and inventories. SB 527 amended SB 1771 to emphasize third-party verification.
September 30, 2000	Senate Bill 1771 (Sher, Chapter 1018, Statutes of 2000)	SB 1771 establishes the creation of the non-profit organization, the California Climate Action Registry and specifies functions and responsibilities to develop a process to identify and qualify third-party organizations approved to provide technical assistance and advice in monitoring greenhouse gas emissions, and setting greenhouse gas (GHG) emissions baselines in coordination with CEC. Also, the bill directs the Registry to enable participating entities to voluntarily record their annual GHG emissions inventories. Also, SB 1771 directs CEC to update the State's greenhouse gas inventory from an existing 1998 report and continuing to update it every five years.
September 28, 1988	Assembly Bill 4420 (Sher, Chapter 1506, Statutes of 1988)	The California Energy Commission (CEC) was statutorily directed to prepare and maintain the inventory of greenhouse gas emissions (GHG) and to study the effects of GHGs and the climate change impacts on the State's energy supply and demand, economy, environment, agriculture, and water supplies. The study also required recommendations for avoiding, reducing, and addressing related impacts - and required the CEC to coordinate the study and any research with federal, state, academic, and industry research projects.

Source: California Air Quality and Climate Legislation | California Air Resources Board

Table 3 – California Climate Change Regulations

Regulation	Description
AB 32 Climate Change Scoping Plan	In June 2021, CARB began holding a Public Workshop Series to commence development of the 2022 Scoping Plan. The 2022 Scoping Plan Update will assess progress towards achieving the SB 32 2030 target of a 40% GHG reduction and lay out a path to achieve carbon neutrality by 2045.
Building Decarbonization/ Building Energy Efficiency Standards	Workshops commenced in February 2021 for developing the 2022 Building Energy Efficiency Standards (Energy Code). The 2022 Energy Code will improve upon the 2019 Energy Code for new construction of, and additions and alterations to, residential and nonresidential buildings. The California Energy Commission (CEC) updates the standards every three years. These CEC standards are part of a broad multi-agency "green building" approach to maximize energy efficiency, conserve water, reduce waste, minimize transportation emissions, and provide good indoor environmental quality to protect occupant health.
Greenhouse Gas Reduction Fund	State program allocating proceeds from cap-and-trade auctions to support investments and projects that reduce greenhouse gas emissions throughout California.
Amendments to the Mandatory Greenhouse Gas Reporting Regulation	The CARB Regulation for the Mandatory Reporting of Greenhouse Gas Emissions was originally approved in 2007 and revised in 2010, 2012, 2013, 2014, 2016 and 2018. Amendments to MRR were approved on March 29, 2019 and became effective on April 1, 2019, for 2019 data. The 2019 amendments were implemented to: • Support California's Cap-and-Trade Regulation to ensure consistency with the calculation of compliance obligations • Ensure that reported GHG emissions and product data are accurate and complete in order to support California's GHG reduction programs
Cap & Trade Amendments	December 2018 amendments to the cap-and-trade regulation included: • New price containment points and a price ceiling • Limits on offset use • New industrial facility leakage assistance factors for 2018 and beyond • Clarifications on electric and gas utility use of allowance value • Compliance provisions for Energy Imbalance Market (EIM)-related GHG emissions • Offset invalidation clarifications • Streamlining implementation requirements • Adjustments to linkage reflecting Ontario's actions to revoke its participation in the cap-and-trade market. September 2016 amendments to the cap-and-trade regulation included: • Emission caps for the post-2020 program • Post-2020 continuation of the allowance price containment reserve • Linking with Ontario's cap-and-trade program • Compliance with the federal Clean Power Plan • Modifications to allowance allocation
Low Carbon Fuel Standard	In September 2015, the Air Resources Board re-adopted the Low Carbon Fuel Standard, to settle issues arising from lawsuits. The requirement is still a 10 percent reduction in the carbon intensity of transportation fuels.
Cap & Trade Offset Protocols	The Air Resources Board has adopted five protocols for offset compliance projects. In addition to the original four protocols adopted in 2011, ARB has adopted: Mine Methane Capture (MMC) Projects Compliance Offset Protocol, adopted April 2014

Appendix B: Greenhouse Gases – Characteristics of Climate Pollutants & Regulatory Setting

Regulation	Description
Cap & Trade Link with Quebec	California linked its cap-and-trade program with Quebec's program in January 2014. Linkage allows for the use of compliance instruments from Quebec's greenhouse gas emission trading system to meet compliance obligations pursuant to the California Cap-and-Trade Regulation, and the reciprocal approval of compliance instruments issued by California to meet compliance obligations in the external trading program.
Building Energy Efficiency Standards	The Energy Commission's 2013 Building Energy Efficiency Standards are 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction. The Standards, which took effect on January 1, 2014, offer builders better windows, insulation, lighting, ventilation systems and other features that reduce energy consumption in homes and businesses.
Advanced Clean Cars Standard	The Advanced Clean Cars Program, approved in January 2012, will achieve additional GHG reductions from passenger vehicles for model years 2017-2025. This Program represents a new approach to passenger vehicles (cars, light trucks) by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards known as Low Emission Vehicles (LEV) III. The new approach also includes efforts under the Zero-Emission Vehicle Program to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California.
Water Appliance Standards	The Energy Commission's 2015 Water Appliance Standards are projected to save 10 billion gallons in the first year, increasing over time to 100 billion gallons of water per year. The energy efficiency and water standards require water appliances to consume less water thereby using less energy while performing the same function. The standards apply to toilets and urinals; residential lavatory faucets; kitchen faucets; public lavatory faucets.
Cap & Trade Rulemaking Activities	A proposed California cap on greenhouse gas emissions and a market-based compliance mechanisms, including compliance offset protocols. OAL approved the rulemaking and filed it with the Secretary of State on December 13, 2011. The regulation will become effective on the January 1, 2012.
Low Carbon Fuel Standards (LCFS)	The regulations are designed to reduce the carbon intensity (CI) of transportation fuels used in California by at least 10 percent by the year 2020. The Air Resources Board approved the LCFS regulation for adoption on April 23, 2009. The regulation entered into full effect on April 15, 2010. Based upon feedback from stakeholders, amendments to the regulations were proposed by the Board in December 2011.
33% Renewable Portfolio Standard	On May 5, 2011, the California Public Utilities Commission adopted the Order Instituting Rulemaking (R.) 11-05-005 to open a new proceeding for the implementation and administration of the 33% RPS Program. The primary focus of the R.11-05-005 proceeding was the implementation of the new 33% RPS law, Senate Bill (SB) 2 (1X) (Simitian), stats. 2011.
Mandatory Commercial Recycling	This regulation addresses recycling requirements for businesses that generate 4 or more cubic yards of commercial solid waste per week and multifamily residential dwellings with 5 or more units, regardless of the amount of waste generated; local jurisdiction requirements for education, outreach, monitoring and reporting; and CalAsphalt and concrete recycling review. The regulations were approved on May 7, 2012.

Source: (Climate Change | California Air Resources Board, 2021).

Table 4 – California Climate Change Executive Orders

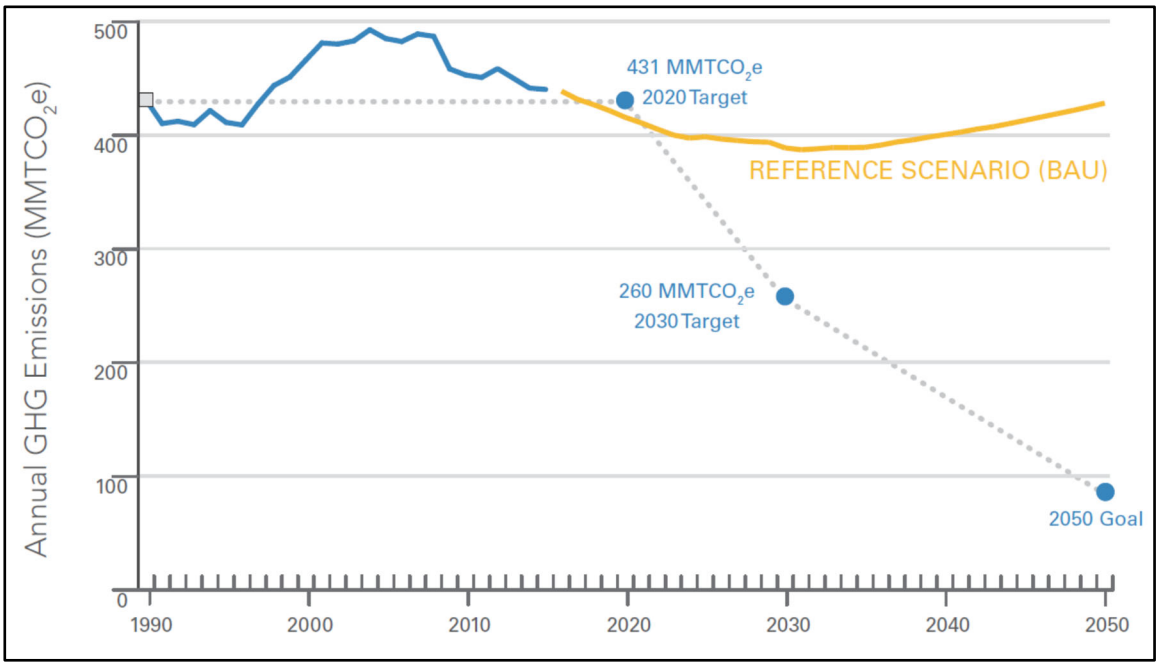
Date	Executive Order	Description
September 23, 2020	N-79-20	EO-N-79-20 requires all California vehicles to be emissions free; cars and passenger trucks by 2035, medium and heavy duty trucks by 2045.
September 20, 2019	N-19-19	EO-N-19-19 requires various state agencies to leverage their existing investments, spending, or state-owned building to further CA's climate goals.
September 10, 2018	B-55-18	EO-B-55-18 establishes a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.
July 17, 2015	B-32-15	EO-B-32-15 Sets goals for ZEVs in freight transportation
April 29, 2015	B-30-15	EO-B-30-15 sets an interim greenhouse gas (GHG) emissions target for 2030 at 40 percent below 1990 levels.
April 25, 2012	B-18-12	EO-B-18-12 calls for significant reductions in State agencies' energy purchases and GHG emissions. The Executive Order included a Green Building Action Plan, which provided additional details and specific requirements for the implementation of the Executive Order
March 23, 2012	B-16-12	EO-B-16-12 orders State agencies to facilitate the rapid commercialization of zero-emission vehicles (ZEVs). The Executive Order sets a target for the number of 1.5 million ZEVs in California by 2025. Also, the Executive Order sets as a target for 2050 a reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels.
September 15, 2009	S-21-09	EO-S-21-09 coordinates renewable energy efforts between CARB, CPUC, and Cal ISO.
November 17, 2008	S-14-08	EO-S-14-08 establishes renewable energy generation share for retail sellers of electricity in California.
November 14, 2008	S-13-08	EO-S-13-08 directs State agencies to plan for sea level rise and climate impacts through coordination of the State Climate Adaptation Strategy.
January 18, 2007	S-01-07	EO-S-01-07 establishes the 2020 target and Low Carbon Fuel Standard. The EO directs the Secretary of Cal/EPA as coordinator of 2020 target activities and requires the Secretary to report back to the Governor and Legislature biannually on progress toward meeting the 2020 target.
October 18, 2006	S-20-06	EO-S-20-06 establishes responsibilities and roles of the Secretary of Cal/EPA and State agencies in climate change.
April 25, 2006	S-06-06	EO-S-06-06 directs Secretary of Cal/EPA to participate in the Bio-Energy Interagency Working Group and addresses biofuels and bioenergy from renewable resources.
June 1, 2005	S-03-05	EO-S-3-05 establishes greenhouse gas emission reduction targets, creates the Climate Action Team, and directs the Secretary of Cal/EPA to coordinate efforts with meeting the targets with the heads of other State agencies. The EO requires the Secretary to report back to the Governor and Legislature biannually on progress toward meeting the GHG targets, GHG impacts to California, Mitigation and Adaptation Plans.
December 14, 2004	S-20-04	EO-S-20-04 (Green Buildings) directs State agencies to reduce energy use in State owned buildings by 20% by 2015 and increase energy efficiency.

Date	Executive Order	Description
April 20, 2004	S-07-04	EO-S-07-04 designates the 21 interstate freeways in California as the "California Hydrogen Highway Network" and directs state agencies to plan and build a network of hydrogen fueling stations along these routes by 2010.

Source: (California Climate Executive Orders - Wikipedia, 2021)

On December 14, 2017, CARB approved the 2017 Climate Change Scoping Plan Update (Scoping Plan) which aims to reduce GHG emissions according to the following graphic. The Scoping Plan "is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state. Every sector, every local government, every region, every resident is part of the solution. The Plan underscores that there is no single solution but rather a balanced mix of strategies to achieve the GHG target. This Plan highlights the fact that a balanced mix of strategies provides California with the greatest level of certainty in meeting the target at a low cost while also improving public health, investing in disadvantaged and low-income communities, protecting consumers, and supporting economic growth, jobs and energy diversity. Successful implementation of this Plan relies, in part, on long-term funding plans to inform future appropriations necessary to achieve California's long-term targets." (2017 Scoping Plan, p. ES4).

Chart 1 – 2030 Target Scoping Plan Reference Scenario



Source: Figure 6 (2017 Scoping Plan, p. 24)

The development of the Scoping Plan began by first modeling a Reference Scenario (BAU). The Reference Scenario is the forecasted statewide GHG emissions through 2030 with

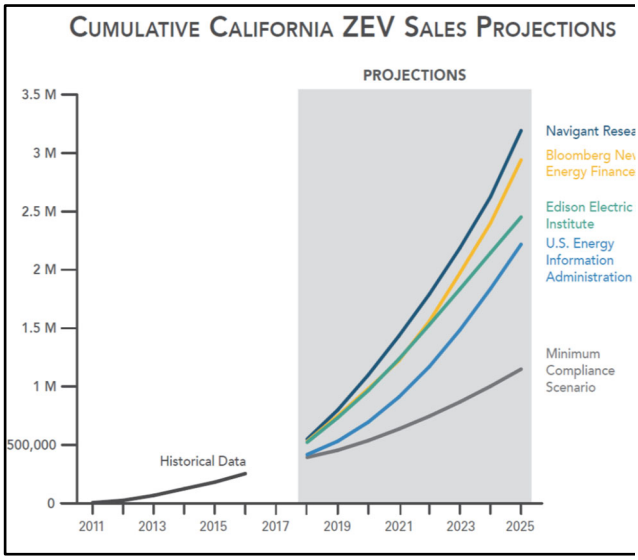
> *existing policies and programs, but without any further action to reduce GHGs. [2017 Scoping Plan] Figure 6 [above] provides the modeling results for a Reference Scenario for this Scoping Plan. The graph shows the State is expected to reduce emissions below the 2020 statewide GHG target, but additional effort will be needed to maintain and continue GHG reductions to meet the mid- (2030) and long-term (2050) targets. Figure 6 depicts a linear, straight-line path to the 2030 target. It should be noted that in any year, GHG emissions may be higher or lower than the straight line. That is to be expected as periods of economic recession or increased economic activity, annual variations in hydropower, and many other factors may influence a single or several years of GHG emissions in the State. CARB's annual GHG reporting and inventory will provide data on progress towards achieving the 2030 target.*
> (2017 Scoping Plan, p. 23).

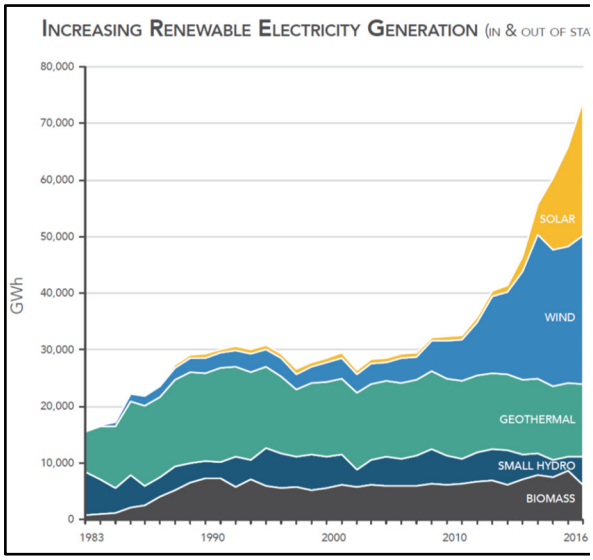
The Scoping Plan states that the California Legislature has shaped the State's climate change program, setting out clear policy objectives over the next decade including:

> - *40% reduction in GHG emissions by 2030;*
> - *50% renewable electricity;*
> - *Double energy efficiency savings;*
> - *Support for clean cars;*
> - *Integrate land use, transit, and affordable housing to curb auto trips;*
> - *Prioritize direct reductions;*
> - *Identify air pollution, health, and social benefits of climate policies;*
> - *Slash "super pollutants" (i.e., hydrofluorocarbons or HFCs);*
> - *Protect and manage natural and working lands;*
> - *Invest in disadvantaged communities; and*
> - *Strong support for Cap-and-Trade.*
>
> (2017 Scoping Plan, p. ES6).

Illustrations from the Scoping Plan that pertain to future emissions from the sectors representing the greatest GHG emissions, transportation and electricity use, are reproduced below.

Chart 2 – 2017 Scoping Plan GHG Exhibits





Source: (2017 Scoping Plan, p. ES5)

Source: (2017 Scoping Plan, p. ES9)

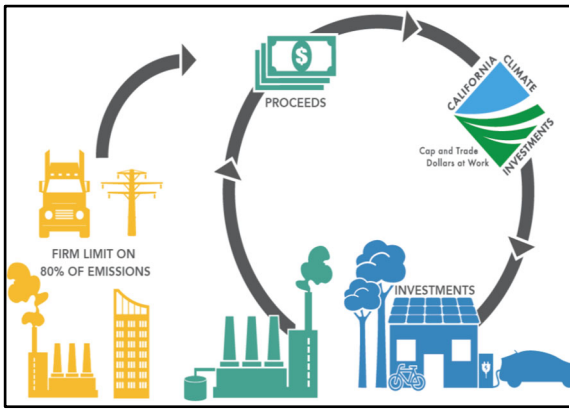
In addition to technology forcing and incentivizing regulations, the Cap-and-Trade Program is critical to meeting the Scoping Plan objectives. CARB states:

> *The Cap-and-Trade Program is fundamental to meeting California's long-range climate targets at low cost. The Cap-and-Trade Program includes GHG emissions from transportation, electricity, industrial, agricultural, waste, residential and commercial sources, and caps them while complementing the other measures needed to meet the 2030 GHG target. Altogether, the emissions covered by the Cap-and-Trade program total 80 percent of all GHG emissions in California. California's response to climate change has led to many innovative programs designed to reduce GHG emissions, including the Renewable Portfolio and Low Carbon Transportation Standards, but the Cap-and-Trade Program guarantees GHG emissions reductions through a strict overall emissions limit that decreases each year, while trading provides businesses with flexibility in their approach to reducing emissions. The Cap-and-Trade Program also generates revenue when the allowances to emit pollution are auctioned. Some of the revenue is returned directly to electricity ratepayers, and the rest is dedicated to reducing GHG emissions by making Legislatively directed investments in California with an emphasis on programs or projects that benefit disadvantaged and low-income communities.*
> (2017 Scoping Plan, p. ES16).

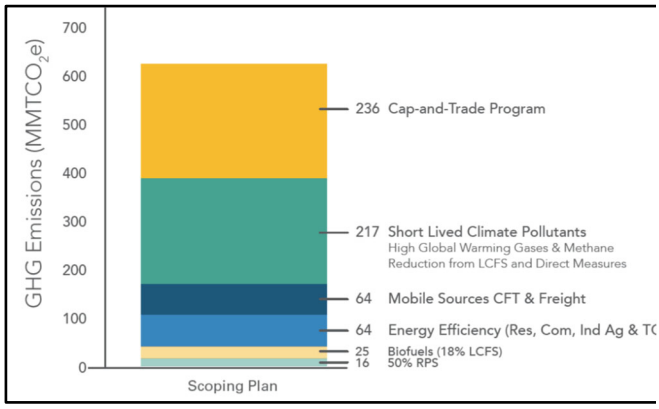
The following illustrations presents how CARB believes money will flow from the Cap-and-Trade program to enable state-funded investments and the amount of GHG emissions reduction that will be achieved

overall and from Cap-and-Trade which is required to cover the gap between reductions from other measures in the Scoping Plan and the 2030 Target.

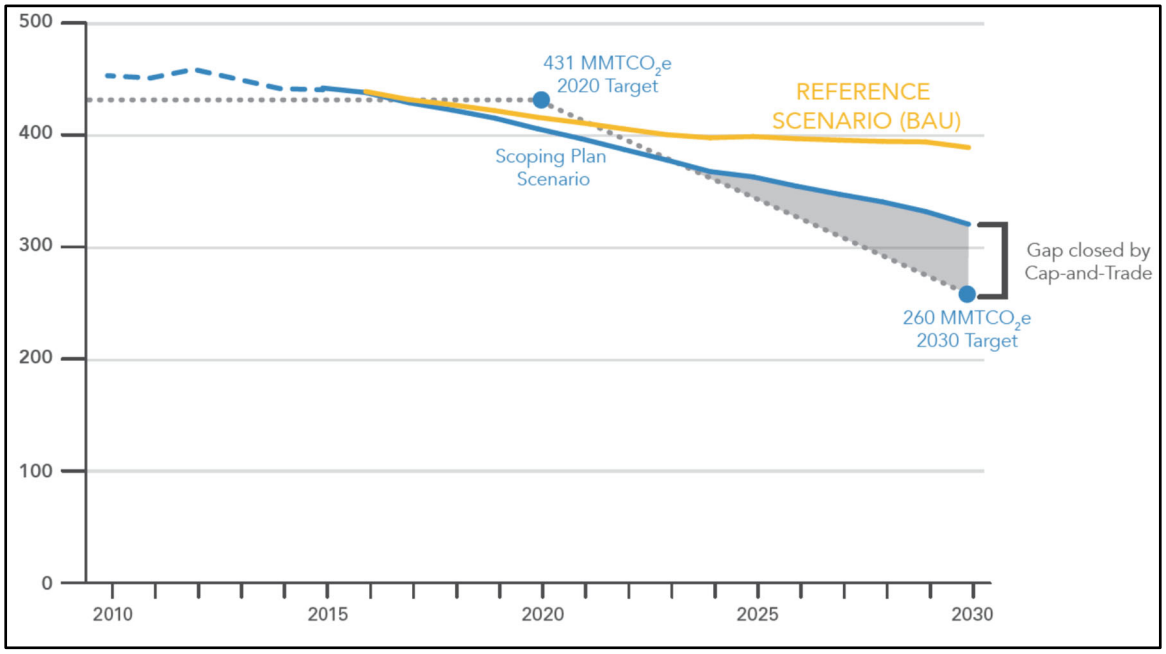
Chart 3 – 2017 Scoping Plan Cap-and-Trade Exhibits



Source: California's Carbon Pricing and Investment Overview (2017 Scoping Plan, p. ES16).



Source: Scoping Plan Scenario – Estimated Cumulative GHG Reductions by Measure (2021 – 2030) (2017 Scoping Plan, p. 28).



Source: 2017 Scoping Plan Reference Scenario (2017 Scoping Plan, p. 24).

Reference Scenario 2030 emissions estimate of 389 $MMTCO_2e$ to the 2030 target of 260 $MMTCO_2e$ and the level of 2030 emissions with the known commitments, estimated to be 320 $MMTCO_2e$. The known commitments are expected to result in emissions that are 60 $MMTCO_2e$ above the target in 2030, and have a cumulative emissions reduction gap of about 236 $MMTCO_2e$. This means the known commitments do not decline fast enough to achieve the 2030 target. The remaining 236 $MMTCO_2e$ of estimated GHG emissions reductions would not be achieved unless further action is taken to reduce GHGs. Consequently, for the Scoping Plan Scenario, the Post-2020 Cap-and-Trade Program would need to deliver 236 $MMTCO_2e$

cumulative GHG emissions reductions from 2021 through 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved.

Table 5 – Climate Change Policies and Measures

Recommended Action	Applies to Project?
Implement SB 350 by 2030: • Increase the Renewables Portfolio Standard to 50 percent of retail sales by 2030 and ensure grid reliability. • Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. • Reduce GHG emissions in the electricity sector through the implementation of the above measures and other actions as modeled in IRPs to meet GHG emissions reductions planning targets in the IRP process. Load-serving entities and publicly- owned utilities meet GHG emissions reductions planning targets through a combination of measures as described in IRPs.	No, Project will purchase grid electricity, not administrate it.
Implement Mobile Source Strategy (Cleaner Technology and Fuels): • At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025. • At least 4.2 million zero emission and plug-in hybrid light-duty electric vehicles by 2030. • Further increase GHG stringency on all light-duty vehicles beyond existing Advanced Clean Cars regulations. • Medium- and heavy-duty GHG Phase 2. • Innovative Clean Transit: Transition to a suite of to-be-determined innovative clean transit options. Assumed 20 percent of new urban buses purchased beginning in 2018 will be zero emission buses with the penetration of zero-emission technology ramped up to 100 percent of new sales in 2030. Also, new natural gas buses, starting in 2018, and diesel buses, starting in 2020, meet the optional heavy-duty low-NO_X standard. • Last Mile Delivery: New regulation that would result in the use of low NO_X or cleaner engines and the deployment of increasing numbers of zero-emission trucks primarily for class 3-7 last mile delivery trucks in California. This measure assumes ZEVs comprise 2.5 percent of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10 percent in 2025 and remaining flat through 2030. • Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and potential additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document "Potential VMT Reduction Strategies for Discussion."	No, Project vehicles are heavy-heavy duty and were not subject to heavy-duty GHG Phase 1 regulations. Thus, they would be unlikely to be subject to these measures.
Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).	No, Project does not affect SB 375 targets.
By 2019, adjust performance measures used to select and design transportation facilities. • Harmonize project performance with emissions reductions, and increase competitiveness of transit and active transportation modes (e.g., via guideline documents, funding programs, project selection, etc.).	No, Project does not affect viability of transit or active modes.

Recommended Action	Applies to Project?
By 2019, develop pricing policies to support low-GHG transportation (e.g., low-emission vehicle zones for heavy duty, road user, parking pricing, transit discounts).	No, Project does not affect government pricing policies.
Implement California Sustainable Freight Action Plan: • Improve freight system efficiency. • Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize both zero and near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	No, Project does not affect whether Freight Action Plan can be implemented.
Adopt a Low Carbon Fuel Standard with a CI reduction of 18 percent.	No, Project does not affect CARB's ability to adopt standards.
Implement the Short-Lived Climate Pollutant Strategy by 2030: • 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels. • 50 percent reduction in black carbon emissions below 2013 levels.	No, Project does not affect whether SLCP strategy can be implemented.
By 2019, develop regulations and programs to support organic waste landfill reduction goals in the SLCP and SB 1383.	No, Project does not affect CARB's ability to adopt regulations.
Implement the post-2020 Cap-and-Trade Program with declining annual caps.	No, Project does not affect CARB's ability to implement Cap-and-Trade.
By 2018, develop Integrated Natural and Working Lands Implementation Plan to secure California's land base as a net carbon sink: • Protect land from conversion through conservation easements and other incentives. • Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity • Utilize wood and agricultural products to increase the amount of carbon stored in the natural and built environments • Establish scenario projections to serve as the foundation for the Implementation Plan	No, Project does not affect ability to develop such a plan.
Establish a carbon accounting framework for natural and working lands as described in SB 859 by 2018.	No, Project does not affect ability to establish such a framework.
Implement Forest Carbon Plan	No, Project does not affect ability to implement such a plan.
Identify and expand funding and financing mechanisms to support GHG reductions across all sectors.	No, Project does not affect whether CARB can identify and expand funding.

Source: (CARB, 2017, pp. 103-104).

Table 6 shows the amount of change in GHG emissions by Scoping Plan sector. Note that Project sources mainly fall into the electric power and transportation sectors with exception of the portable generator which would be in the industrial sector but is likely to be owned and operated by a contractor.

Table 6 – Estimated Change in GHG Emissions by Sector

Scoping Plan Category	1990 ($MMTCO_2e$)	2030 Scoping Plan Ranges ($MMTCO_2e$)
Agriculture	26	24–25
Residential and Commercial	44	38–40
Electric Power	108	30–53
High GWP	3	8–11
Industrial	98	83–90
Recycling and Waste	7	8–9
Transportation (Including TCU)	152	103–111
Natural Working Lands Net Sink*	-7***	TBD
Sub Total	431	294–339
Cap-and-Trade Program	n/a	34–79
Total	**431**	**260**

Source: (2017 Scoping Plan, p. 31).

* Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

** The SLCP will reduce emissions in this sector by 40 percent from 2013 levels. However, the 2030 levels are still higher than the 1990 levels as emissions in this sector have grown between 1990 and 2013.

*** This number reflects net results and is different than the intervention targets discussed in Chapter 4.

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MEMORANDUM

To: Scott Cohen, SESPE Consulting, INC

From: Jan Bowen, Provost & Pritchard

Subject: McKay Point Project Construction

Date: 3/18/2015

This memo explains the assumptions that were used to estimate construction phase lengths and equipment, and yearly project operations and project operation equipment for the McKay Point Project.

Construction Phase:

The following assumes that the slurry wall would be constructed by an outside contractor and the in/out flow grading, in/out flow building and generator/barge pump would be constructed by Tulare Irrigation District (TID). A list of TID's current construction equipment is attached. Total operational times are reported in number of days assuming a day is eight hours of operation. If during construction the daily hours (or number of excavators, dozers, loaders, etc.) of operation were increased, then the actual days of construction would be reduced accordingly.

Slurry Wall

Slurry wall construction consists of clearing and grubbing approximately 26 acres, excavating approximately 109,000 cubic yards of native soil, and the poring of the slurry wall into the excavated trench. Excavated soils would be hauled to an onsite screening/mixing site and screened for use in the slurry wall mix. Approximately 4,000 dry tons of bentonite and 56,000 tons silty/clay fines would be delivered to the site for use in the slurry wall. Excess native soils would either be spread or stored on site. Construction slurry consisting of a bentonite-water slurry would be pumped into the trench to hold the sides of the trench open during construction. A mixture of bentonite, imported silty/clay fines and native soil would be used for the final slurry wall. The slurry wall would be hauled from the mixing site and placed into the trench. A final native soil cap consisting of approximately 10,000 cubic yards would be placed on top of the slurry wall. The following table lists the approximate equipment activity levels for construction:

Slurry Wall Excavation and Installation					
Description	*Equipment*	*HP*	*Rate*	*Quantity*	*# of 8 hour Days*
Clear/Grub, Haul Road, Construction Ponds	Dozer	165	1 hr/ac	26 ac	4
Slurry Wall Excavation	Excavator	429	1.7 cy/bucket	109,000 cy @ 25 bucket/hr	321
Haul Excavated Soil To Mixing Site and Return With Slurry Mix	Dump Truck	300	10 cy/haul	119,000 cy @ 4 hauls/hour	372
Plug Mill for Sieving Native Soils	Generator	100	4 hr/day	401 day	201
Mixing and Moving Slurry Mix	Loader	349	3 cy/bucket	119,000 cy @ 20 bucket/hr	248
Construction Slurry Pump	Generator	84	N/A	N/A	321
Dust Control	Water Truck	230	2 hr/day	401 days	100

In/Out Flow Grading

In/out flow grading consists of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards, and the placement of approximately 9,000 cubic yards of rip-rap. Excavated soils are assumed to be spread on site. The following table lists the approximate equipment activity levels for construction:

In/Out Flow Grading					
Description	*Equipment*	*HP*	*Rate*	*Quantity*	*# of 8 hour Days*
Clear and Grub, Haul Roads	Dozer	165	1 hr/ac	3 ac	1
Canal Excavation and Spreading	Tractor	530	15 cy/load	20,000 cy @ 3 load/hr	56
Final Shaping of Canal	Grader	200	0.5 hr/ac	3 ac	1
Placing of Rip-Rap	Excavator	184	1 cy/bucket	9,000 cy @ 20 bucket/hr	56
Hauling of Rip-Rap	Dump Truck	300	10 cy/Haul	9,000 cy @ 4 haul/hr	28
Dust Control	Water Truck	230	2 hr/day	56 day	14

In/Out Flow Building

Construction of the in/out flow building would consist of finish grading and minor excavation of approximately 600 cubic yards and the placement of approximately 1,100 cubic yards of concrete. Excavated soils are assumed to be spread on site. The following table lists the approximate equipment activity levels for construction:

In/Out Flow Building					
Description	*Equipment*	*HP*	*Rate*	*Quantity*	*# of 8 hour Days*
Minor Excavation, Structural Compaction	Excavator	184	1 cy/bucket	500 cy @ 20 bucket/hr	3
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hy	100 cy	3
Concrete Placement (Pump)	Generator	84	20 cy/hr	1,100 cy	7
Placing of Box Culvert	Crane	250	N/A	N/A	10
Dust Control, Soil Conditioning	Water Truck	230	1 hr/day	24	3

Generator/Barge Pump

Construction of the generator/barge pump would consist of finish grading and minor excavation, tank and building pad concrete slabs, and excavation and placement of the barge pump discharge pipes. The following table lists the approximate equipment activity levels for construction:

Generator/Barge Pump					
Description	*Equipment*	*HP*	*Rate*	*Quantity*	*# of 8 hour Days*
Minor Excavation and Moving of Materials	Backhoe	108	4 cy/hr	50 cy	2
Pipe Trench Excavation, Backfill, and Compaction	Excavator	184	200 ft/ 8 hr	1200 ft	6
Concrete Placement (Pump)	Generator	84	N/A	N/A	1
Dust Control, Soil Conditioning	Water Truck	230	1 hr/day	8 days	1

Project Operations:

The following assumes that on average the proposed basin could be filled two times per year for a total usable yearly volume of 9,200 acres-feet. Approximately 2,200 acres-feet can flow by gravity into the St. Johns River and the remaining 7,000 acres-feet can be pumped out at a maximum flow rate of 160 cubic feet per second. The following table lists the approximate equipment activity levels for operations:

Project Operations					
Description	*Equipment*	*HP*	*Rate*	*Quantity*	*# of 8 hour Days*
Pumping	Generator	600	160 cfs	7,700 ac-ft	73
Minor Site Maintenance	Backhoe	108	N/A	N/A	20
On Road Vehicles					
Description	*Equipment*	*Vehicle Miles Traveled / Year*			
Support Trucks	Spray Truck	380			
Support Trucks	Pickup	2,080			
Support Trucks	Fuel Truck	450			

American Thoracic Society

What Constitutes an Adverse Health Effect of Air Pollution?

THIS OFFICIAL STATEMENT OF THE AMERICAN THORACIC SOCIETY WAS ADOPTED BY THE ATS BOARD OF DIRECTORS, JULY 1999

PURPOSE OF THE STATEMENT

As the twentieth century ends, the health effects of outdoor air pollution remain a public health concern in developing and developed countries alike. In the United States, the principal pollutants monitored for regulatory purposes (carbon monoxide, nitrogen dioxide, sulfur dioxide, particles, ozone, and lead; see Table 1) show general trends of declining concentrations, although ozone pollution now affects many regions of the country besides southern California (1). Yet, even at levels of air pollution now measured in many cities of the United States, associations between air pollution levels and health indicators are being demonstrated at concentrations around those set by standards of the U.S. Environmental Protection Agency (2, 3). In many countries of the developing world, concentrations of air pollutants are rising with industrialization and the increasing numbers of motor vehicles (4, 5). Extremely large and densely populated urban areas, often referred to as "megacities," have the potential to generate unprecedented air quality problems.

There are common principles to air quality management throughout the world. Public health protection unifies all approaches, whether based on voluntary guidelines, mandated standards for concentrations, or source control. The intent is to limit or to avoid any impact of air pollution on the public's health. Air quality management is thus based on a scientific foundation built from the epidemiologic, toxicologic, and clinical evidence on health effects of air pollution. In interpreting this evidence for public health protection, there is a need to identify those effects that are considered "adverse" and to separate them from those effects not considered adverse.

The American Thoracic Society has previously provided guidance on the distinction between adverse and nonadverse health effects of air pollution in its 1985 statement, "Guidelines as to What Constitutes an Adverse Respiratory Health Effect" (6). Definitions of adverse effects have also been offered by the World Health Organization (7–10), but the guidance of the American Thoracic Society has received particular emphasis in the United States. Preparation of the original statement was intended to coincide with consideration of the passage of an amended Clean Air Act and to provide a framework for interpreting scientific evidence relevant to the mandate of the act. In particular, the Clean Air Act requires that the Administrator of the Environmental Protection Agency promulgate, for certain pollutants, standards that will be sufficient to protect against adverse effects of the air pollutants on health. The act is silent on the definition of "adverse effect" and, at the time of the 1985 statement, there was considerable controversy around the interpretation of this language as revision of the act was being considered. Recognizing the need of policy makers for expert guidance, the American Thoracic Society released the 1985 statement, which to date constitutes the sole set of recommendations on this issue from an expert panel convened by a health organization.

The American Thoracic Society has revised the 1985 statement because new scientific findings, published since the original statement, have again raised questions as to the boundary between adverse and nonadverse in considering health effects of air pollution. These new findings reflect improved sensitivity of research approaches and the application of biomarkers that can detect even subtle perturbations of biologic systems by air pollutants. Epidemiologic research designs have been refined and large sample sizes and increasingly accurate methods for exposure assessment have increased the sensitivity of epidemiologic data for detecting evidence of effects. New statistical approaches and advances in software and hardware have facilitated analyses of large databases of mortality and morbidity information. The design of clinical studies-including controlled exposures of volunteers-has also advanced and biologic specimens may be obtained after exposure, for example, by fiberoptic bronchoscopy, to identify changes in levels of markers of injury. Toxicologic studies have also gained in sophistication through incorporation of more sensitive indicators of effect and the careful tracing of the relationship between exposure and biologically relevant doses to target sites, which may now be considered at a molecular level.

New dimensions have been added to the array of outcome measures. Medical outcomes research now recognizes that patient well-being should be broadly conceptualized and measured rigorously, in addition to considering the biological process of the disease itself. As a result, health-related quality of life, the perception of well-being, is now considered a necessary component of outcomes research. Validated instruments have been developed to assess the impact of health-related symptoms and impairment on functional status and quality of life (11-14). The formalization of the concept of environmental justice acknowledges that the effects of specific pollutants cannot be evaluated in isolation without giving consideration to the overlapping exposures of populations, often minority group members of low socioeconomic status, who live in neighborhoods that are heavily exposed to multiple environmental contaminants (15).

This new statement, like the 1985 statement, is intended to provide guidance to policy makers and others who interpret the scientific evidence on the health effects of air pollution for the purpose of risk management. The statement does not offer strict rules or numerical criteria, but rather proposes principles to be used in weighing the evidence and setting boundaries between adverse and nonadverse health effects. Even if the technical tools were available for scaling the consequences of air pollution on the multiple relevant axes, the placement of dividing lines should be a societal judgment and consequently

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TABLE 1

U.S. NATIONAL AMBIENT AIR QUALITY STANDARDS*

Pollutant	NAAQS Concentration (ppm)	NAAQS Concentration ($\mu g/m^3$)	Standard Type
Particulate matter ≥ 10 Pm (PM_{10})			
24-h average		150	Primary and secondary
Annual arithmetic mean		50	Primary and secondary
Particulate matter ≥ 2.5 μm ($PM_{2.5}$)			
24-h average		65	Primary and secondary
Annual arithmetic mean		15	Primary and secondary
Ozone (O_3)			
24-h average	0.12	235	Primary and secondary
Annual arithmetic mean	0.08	157	Primary and secondary
Sulfur dioxide (SO_2)			
24-h average	0.14	365	Primary
Annual arithmetic mean	0.03	80	Primary
3-h average	0.50	1,300	Secondary
Nitrogen dioxide (NO_2)			
Annual arithmetic mean	0.053	100	Primary and secondary
Carbon monoxide (CO)			
1-h average	35	40	Primary
8-h average	9	10	Primary
Lead (Pb)			
Quarterly average		1.5	Primary and secondary

* For detailed information on scientific bases and policy considerations underlying decisions establishing the NAAQS listed here, see the AQCDs, staff papers, and NAAQS Promulgation notices cited in text. Such information can also be obtained from several internet websites (e.g., http://www.epa.giv/airs/criteria.html; http://www.epa.gov/oar/oaqps/publicat.html; and http://www.epa.gov/ncea/biblio.htm).

TABLE 2

ADVERSE RESPIRATORY HEALTH EFFECTS

A. Increased mortality (*Increased* as used here and subsequently means significantly [$p < 0.05$] increased above that recorded in some standard, comparable population. In selected situation, $p < 0.1$ may be appropriate)
B. Increased incidence of cancer
C. Increased frequency of symptomatic asthmatic attacks
D. Increased incidence of lower respiratory tract infections
E. Increased exacerbations of disease in persons with chronic cardiopulmonary or other disease that could be reflected in a variety of ways
   1. Less able to cope with daily activities (i.e., shortness of breath or increased anginal episodes)
   2. Increased hospitalization, both frequency and duration
   3. Increased emergency ward or physician visits
   4. Increased pulmonary medication
   5. Decreased pulmonary function
F. Reduction in FEV_1 or FVC associated with clinical symptoms
   1. Chronic reduction in FEV, or FVC associated with clinical symptoms
   2. A significant increase in number of persons with FEV_1 below normal limits: chronically reduced FEV, is a 'predictor of increased risk of mortality. Transient or reversible reductions that are not associated with an asthmatic attack appear to be less important. It should be emphasized that a small but significant reduction in a population mean FEV, or $FEV_{.75}$ is probably medically significant, as such a difference may indicate an increase in the number of persons witn respiratory impairment in the population. In other words, a small part of the population may manifest a marked change that is medically significant to them, but when diluted with the rest of the population the change appears to be small
   3 An increased rate of decline in pulmonary function (FEV,) relative to the predicted value in adults with increasing age or failure of children to maintain their predicted FEV, growth curve. Such data must be standardized for sex, race, height, and other demographic and anthropometric factors
G. Increased prevalence of wheezing in the chest apart from colds, or of wheezing most days or nights. (The significance of wheezing with colds needs more study and evaluation.)
H. Increased prevalence or incidence of chest tightness
I. Increased prevalence or incidence of cough/phlegm production requiring medical attention
I. Increased incidence of acute upper respiratory infections that interfere with normal activity
K. Acute upper respiratory tract infections that do not interfere with normal activity
L. Eye, nose, and throat irritation that may interfere with normal activity (i.e., driving a car) if severe
M. Odors

this committee does not propose specific boundaries for separating adverse from nonadverse effects.

OVERVIEW OF THE 1985 STATEMENT

The 1985 statement of the American Thoracic Society was directed at respiratory health effects of air pollution and emphasized the interpretation of the epidemiologic evidence. The statement recognized the spectrum of responses to air pollution, which begins with exposure and evidence of exposure and ends at death. This spectrum has been characterized as a pyramid, based in the most common consequence-exposure-and having mortality, the least common and most severe consequence, at its tip. The statement included a table that lists adverse respiratory health effects, seemingly in order of declining severity (Table 2). The 1985 statement hinged the distinction between adverse and nonadverse effects on medical considerations. The committee recognized that the boundary is further influenced by societal considerations: "Where one draws the line to categorize it as an adverse health effect or an action level between pathophysiologic or physiologic change is probably best left to the individual or the community."

The committee's definition of adverse respiratory health effects was ". medically significant physiologic or pathologic changes generally evidenced by one or more of the following: (*1*) interference with the normal activity of the affected person or persons, (2) episodic respiratory illness, (3) incapacitating illness, (4) permanent respiratory injury, and/or (5) progressive respiratory dysfunction." The committee noted that all changes are not adverse, citing the example of carboxyhemoglobin. The level of carboxyhemoglobin, beyond that from endogenous production, is indicative of exposure but it is not predictive of adverse effects until reaching threshold levels, depending on the effect and the susceptibility of the exposed person. The statement recognized that a distinction should be drawn between effects to individuals and effects to populations and that populations are heterogeneous in their susceptibility. The comment was offered that a change in a population could be "medically significant" for that group. The statement also provides guidance on interpretation of'reversible effects and on interpreting irreversible effects. In acknowledging that research would continue to address uncertainties, the committee recommended that the guidelines should be periodically reviewed and updated.

METHODOLOGY FOR DEVELOPING THIS STATEMENT

Following the recommendation of the committee that authored the 1985 statement, the Environmental and Occupational Health Assembly of the American Thoracic Society recognized a need to reconvene a group to review and revise the prior statement. The statement had been used for more than a decade and new investigative approaches were being used to identify effects of air pollution that were not considered by the first committee. In addition, societal perspectives had shifted since the early 1980s and a forma1 concern for the impact of air

pollution on specific groups had been expressed through the environmental justice movement.

To revise the statement, a multidisciplinary committee was convened in 1997 that included expertise in pulmonary medicine, public health, epidemiology, both clinical and animal toxicology, biochemistry, and cellular and molecular biology. This committee conducted several planning meetings and consulted experts in environmental economics and in ethics. In addition, a multidisciplinary workshop was convened to gain input from the range of groups potentially interested in the statement and its application. The committee's approach was discussed at a symposium held at the 1999 Annual Meeting of the American Thoracic Society. After further revisions, the statement was reviewed and submitted to the Board of the American Thoracic Society.

BACKGROUND ON THE CLEAN AIR ACT

The preparation of the original statement was largely motivated by potential ambiguity in interpreting the language of the Clean Air Act, which addresses adverse effects of air pollution without providing clear guidance as to the distinction between adverse and nonadverse effects. In addition, questions regarding this distinction arise repeatedly in interpreting the findings of research studies, whether observational or experimental. Consequently, the 1985 statement has had broader application than just the interpretation of evidence on air pollution and health for the purpose of promulgating air quality regulations. Nonetheless, the committee found the legislative history of the Clean Air Act to be relevant to its charge.

The first national legislation on air pollution, the Air Pollution Control Act, was passed in the mid-1950s; the original Clean Air Act was passed in 1963 and last revised in 1990. The act is lengthy and complex in its provisions; most relevant to considerations in defining an adverse health effect are Sections 108 (Air Quality Criteria and Control Techniques), 109 (National Ambient Air Quality Standards), and 112 (Hazardous Air Pollutants). National Ambient Air Quality Standards (NAAQS) are set individually for six prevalent pollutants (Table 1), often referred to as "criteria pollutants." They are so designated because of the requirement for comprehensively reviewing relevant information in a criteria document. The primary NAAQS are to be set at a level that protects the public health with an adequate margin of safety, regardless of economic or technical feasibility of attainment. The secondary standards are concerned with welfare and environmental consequences.

The hazardous air pollutants, as defined in Section 112, are not covered under Sections 108 and 109 as criteria pollutants. In 1990, the Congress offered a list of 189 such pollutants and a process for listing and delisting substances. The 1990 Clean Air Act states: "The Administrator shall periodically review [and revise] the list [of 189 hazardous air pollutants] by. adding pollutants which present, or may present, through inhalation or other routes of exposure, a threat of adverse human health effects (including, but not limited to substances which are known to be, or may reasonably be anticipated to be, carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or which are acutely or chronically toxic). ." Section 112(f)(2) further directs the Environmental Protection Agency to assess whether the emissions standards for the listed hazardous air pollutants required under other subsections "provide an ample margin of safety to protect public health" and if not, then the agency is to develop standards that will address the "remaining risk."

The historical record provides an indication of the intent of the Congress in framing the language of the Clean Air Act with regard to protection of the public's health. Research now shows that the most highly susceptible individuals may respond to common exposures that are often at or close to natural background pollutant levels.

With regard to sensitivity, the 1970 Clean Air Act recognized that some persons were so ill as to need controlled environments, e.g., persons in intensive care units or newborn infants in nurseries; the act stated that the standards might not necessarily protect such individuals. It further stated, however, that the standards should protect "particularly sensitive citizens such as bronchial asthmatics and emphysematics who in the normal course of daily activity are exposed to the ambient environment." The act further suggested that the adequacy of any standard could be tested in a statistically representative sample of sensitive individuals. The hearing record on the 1970 act is informative. Dr. Hon T. Middleton (Commissioner, National Air Pollution Control Administration, Department of Health, Education, and Welfare) addressed the Senate Subcommittee on Air and Water Pollution of the Committee on Public Works on May 27, 1970. He testified that the intent of any national air quality standard is to be "protective of health in all places" and set at a level below which effects have not been observed. Dr. Middleton recognized the difficulty of finding a demarcation point of exposure below which there is no effect and he noted that there may be subtle effects and evolving scientific understanding.

Further difficulties in the language of the Clean Air Act were later noted in ***A Legislative History of the Clean Air Act Amendments of 1977: A Continuation of the Clean Air Act Amendments of 1970.*** This document noted the difficulty of applying the margin of safety and the erosion of margins of safety by advancing scientific knowledge. The document also commented on the implicit assumption of a safe threshold in the language of the act and the implausibility of this assumption. The report questioned whether the NAAQS (I) protect against genetic mutations, birth defects, and cancer, (2) take sufficient account of the consequences of long-term low-level exposures or short-term peaks, and (3) sufficiently consider synergism among pollutants and the formation of secondary pollutants, e.g., sulfates, with their own toxicity. These considerations remain relevant more than 20 years later.

This selective review of the historical record indicates that Congress intended that the NAAQS would afford health protection not only to the general population but to subgroups with enhanced susceptibility to air pollution, including people with asthma and people with chronic obstructive lung disease. Nevertheless, it is also clear that some exquisitely susceptible individuals might remain outside the ambit of protection of the NAAQS. A margin of safety was to be provided but quantitative specification was not offered. The evolutionary nature of the supporting scientific evidence was repetitively acknowledged and the need to distinguish adverse from nonadverse effects was at least implicitly recognized. The current language of Section 112 explicitly acknowledges the possibility of shifting understanding of risks of specific hazardous air pollutants.

GENERAL CONSIDERATIONS

In preparing the statement, the committee identified several general considerations that are relevant to interpreting evidence on the health effects of air pollution. Each of these considerations and the committee's judgment as to their proper weighting are detailed below.

Population Health versus Individual Risk

The effects of air pollution can be viewed in the complementary contexts of the increment of an individual's risk for disease—the clinician's measure of impact-and of the additional risk incurred by a population, which is the public health perspectivc (16). Both perspectives arc relevant to interpreting research findings on air pollution and to regulations that are protective of the public's health. Any risk incurred by an exposed individual beyond some boundary, determined by the individual or on a societal basis, could be deemed unacceptable. For example. prolonged exposure to a respiratory carcinogen could result in an individual-level incremental risk of exposure of 10^{-4}, more than two orders of magnitude lower than the baseline lifetime individual risk in the United States. Nevertheless, among an exposed population of IO', the estimated number of cancer cases that might result from such an exposure would number 10^{3}, illustrating that minute individual risks may be significant from the standpoint of population exposures.

Exposure could also enhance risk for a population to an unacceptable degree, perhaps without shifting the risks of any particular individuals to an unacceptable level. Figure 1 illustrates the distinction. In Figure l A, the population's distribution of exposure shifts toward a higher level and some members of the population cross the boundary to an unacceptable risk. In Figure lB, the shift affects the position of the population distribution, but no individuals move to an unacceptable level of risk. Effects on persons with asthma are illustrative. A population of children with asthma could have a distribution of lung function such that no individual child has a level associated with significant impairment. Exposure to air pollution could shift the distribution toward lower levels without bringing any individual child to a level that is associated with clinically relevant consequences. Individuals within the population would, however, have diminished reserve function and are at potentially increased risk if affected by another agent, e.g., a viral infection. Assuming that the relationship between the risk factor and the disease is causal, the committee considered that such a shift in the risk factor distribution, and hence the risk profile of the exposed population. should be considered adverse, even in the absence of the immediate occurrence of frank illness.

Ethics and Equity

The past decade has brought increasing concern over the ethics of heterogeneous, inequitable distributions of environmental and occupational exposures (IS). Within the United States, some groups receive disproportionate exposures to environmental agents that arc injurious to health; the environmental justice movement seeks to redress these inequities. The exposures of concern originate in breathing polluted outdoor air, living in substandard housing with indoor air pollution problems, including exposures to certain bioacrosols and combustion products, and working in jobs with occupational respiratory risks. Groups encompassed by this movement in the United States include various racial and ethnic minority populations. particularly those living within urban areas, and the socioeconomically disadvantaged. In the developing world, such exposures can occur at substantially higher levels and may, in some instances, extend to a majority of a given nation's population. Limited access to care and medications may enhance susceptibility to pollution.

The concept of environmental equity had not been formally voiced when the 1985 statement was written. The present committee viewed inequities of exposure as potentially representing a form of susceptibility to air pollution. In other words, individuals within the target groups may be at increased risk of experiencing adverse effects from a given level of ambient air pollution because their baseline risk level may have been raised by other exposures. Moreover, in some instances there may be genetic and nutritional factors enhancing susceptibility as well. It should be noted, however, that there are other exposure scenarios and other subpopulations with increased baseline risks that are not formally included within the environmental justice movement. The heterogeneity of populations needs full acknowledgment, whether it reflects disproportionate noxious exposures or other factors. Observing that there have been few investigations of the effects of other exposures, genetics, or nutrition on susceptibility to air pollution-related effects, either in the United States or internationally, the committee issued a call for additional research in these areas.

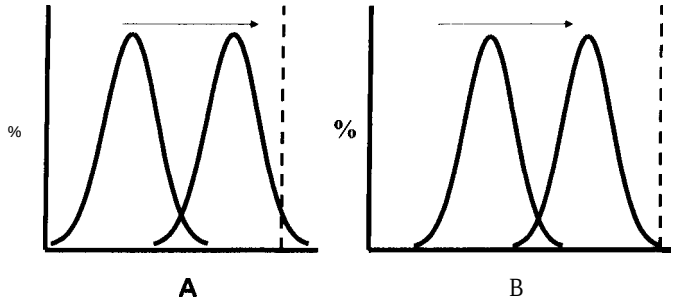


Figure 7. Hypothetical distributions **of exposure for two populations, *A* and *B*. (See text for explanation.)**

Economic Costs

Adverse health effects of air pollution incur costs, including direct costs of providing treatment for illness and indirect costs of lost work time and productivity. Cost-benefit analysis provides an estimate of the balancing of the costs of controls against the benefits; cost effectiveness analysis provides an indication of the level of control accomplished in relation to costs. Cost-benefit and cost-effectiveness analysis are assumption-laden tools now being used for policy-making purposes. Cost estimates depend on the valuation given to illness, lost work time and productivity, and even to lost life. It has been proposed that cost-benefit analysis may facilitate the process of deciding whether a given air pollution-related health impact should be considered adverse. The legislative history of the Clean Air Act explicitly excludes consideration of economic factors in setting ambient air quality standards or in developing emissions standards for hazardous air pollutants. In the context of air quality regulation, cost-benefit analysis is a multistep process involving the articulation of value judgments regarding potential costs (expenditures of public and private resources to reduce pollutant emissions and exposures) versus benefits (avoidance of specified adverse health impacts in a designated population). Benefits, in theory, should be quantified as the willingness of beneficiaries to pay to avoid the adverse impact. In practice, quantification of such health impacts from exposure to air pollution is often based on direct costs related to medical treatment and indirect costs such as school absenteeism, lost work time, decreased productivity, and, at the extreme, person-years of life lost. Valuations of a given effect may vary internationally, as differences in population age distributions, comorbidity, nutritional status, and other circumstances can affect this process. Ideally, cost–bene-

fit analysis should make explicit the value judgments underlying these assessments, highlighting distinctions among alternative pollution control strategies to achieve specific air quality standards. Willingness of individuals to pay to avoid adverse health effects is also estimated from responses to contingent valuation surveys and from market data concerning choices about employment that carries health risks.

Nevertheless, the committee concurred that the specification of which health effects should be considered adverse must precede the application of cost-benefit analysis for evaluation of air pollution control strategies. That is, once a given outcome is designated as adverse, this information can be used as input to cost-benefit analysis. Estimates of costs associated with a given health outcome. while useful from a public policy perspective, cannot be translated into any clinical or biological framework to distinguish adverse from nonadverse effects. Therefore, the committee concluded that however valuable this economists' tool may be for regulatory decision-making, cost-benefit analysis lay outside the scope of this position paper and, indeed, the expertise of the American Thoracic Society.

Susceptibility

The issue of susceptibility has been recognized throughout the history of our initiatives to regulate outdoor air pollution. Susceptibility, broadly defined, may include extrinsic factors, including the profile of exposures to other pollutants, for example, in the workplace or at home, and intrinsic factors, for example, genotype. The size of the population of individuals susceptible to indoor air pollution is large, potentially including infants and the elderly, persons with chronic heart and lung diseases, and the immunocompromised. Persons with multiple deleterious exposures may also be considered as having heightened susceptibility, particularly if the combined effects of the agents are synergistic. Even with the populations considered as susceptible there is a distribution of the degree of susceptibility. For example, levels of nonspecific airway responsiveness in persons with asthma span several orders of magnitude.

The current explosive growth in knowledge of the genetic basis of lung disease, including responses to environmental agents, will provide increasing insights into the mechanistic basis of susceptibility and provide markers of risk status. We already have evidence of between-person variation in the pulmonary function response to ozone and interstrain variation in the pulmonary effects of environmental exposures, including criteria pollutants, in rodent species. As we develop the capacity to more precisely identify those at risk, we may find it increasingly challenging to assure protection for all individuals against adverse health effects.

The present committee agreed with the principle espoused in the Clean Air Act: that regulations should extend protection to include those with enhanced susceptibility to air pollution, recognizing that some highly susceptible individuals may still respond to low-level exposures. Research now shows that some highly susceptible individuals may respond to common exposures that are often unavoidable. Furthermore, by definition, susceptible individuals cannot have the same margin of safety as the nonsusceptible groups within the population.

Heterogeneity of Perspectives

In society there is an extraordinary range of views on environmental issues and tolerance of risk. Looking more globally to other developed countries and to the developing countries, the range of perspectives is even broader. The committee acknowledges that any defined boundaries for distinguishing adverse health effects may not be embraced by all groups. This heterogeneity and the possibility that some may reject the committee's proposal challenged the committee to recommend in principle that control measures should maximize public health benefits while assuring equity.

DIMENSIONS OF ADVERSE EFFECTS

Biomarkers

Biomarkers are indicators of exposure, effect, or susceptibility that are measured in biologic materials, such as blood or bronchoalveolar lavage fluid. The concept of biomarkers has been formalized since the 1985 statement (17) and since then. a continuously increasing number of candidate indicators of exposure, effect, and susceptibility have been developed and applied in laboratory studies of humans and animals and in both occupational and environmental population studies. The progressive refinement of techniques in the field of cellular and molecular biology, and the burgeoning understanding of the complex chemical intracellular and cell-to-cell signaling pathways collectively termed "cytokines" (18), have rapidly expanded the spectrum of candidate markers of effects. It is now possible to detect very early, or initiating phases of responses at the molecular level, such as the production of mRNA for cytokines. Similarly, the progressive development of genetic assays and understanding of the human genome have provided numerous candidate markers of both effects and susceptibility (19).

Biomarkers relevant to air pollution have been measured in blood, exhaled air, urine, sputum, and in bronchoalveolar lavage fluids and tissue specimens collected by bronchoscopy. Bronchoalveolar lavage fluids, for example, are now frequently analyzed for cell numbers and types, cytokines (e.g., several interleukins and tumor necrosis factor α), enzymes (e.g., lactate dehydrogenasc and β-glucoronidase), fibronectin, protein, arachidonic acid metabolites, and reactive oxygen species. Because many of the epithelial cell types of the nasopharyngeal region are similar to epithelia and responses in the trachea, bronchi, and bronchioles, responses of nasal cells have been examined as potential biomarkers for their ability to predict parallel responses in lung airways, which are more difficult to sample.

Biomarkers have been extensively applied in toxicologic studies of air pollution, both in animals and in clinical studies involving exposures of human volunteers. The biomarkcrs are examined for their ability to provide evidence of "biologically effective" doses, including the earliest phases of homeostatic responses, the occurrence of injury, outcomes that are intermediate between injury and disease, and the presence of established disease processes. Genetic markers of susceptibility have begun to be applied to the respiratory system, and this application will undoubtedly expand rapidly. A frequent goal of biomarker development is the ability to readily measure changes that precede and predict continued or progressive events leading to clinical effects and disease (Figure 2).

To date, although biomarkers have proved informative about homeostatic adjustments to exposure and the mechanisms of injury and disease, lack of validation against previously established measures of effect. such as clinical status or even physiologic impairment, remains an important weakness. We do not know if elevations of biomarkers during short-term experimental exposures signal risk for ongoing injury and clinical effects or simply indicate transient responses that can provide insights into mechanisms of injury. The utility of some older biomarkers is well established, such as the relationships among carboxyhemoglobin. exposure to carbon monoxide,

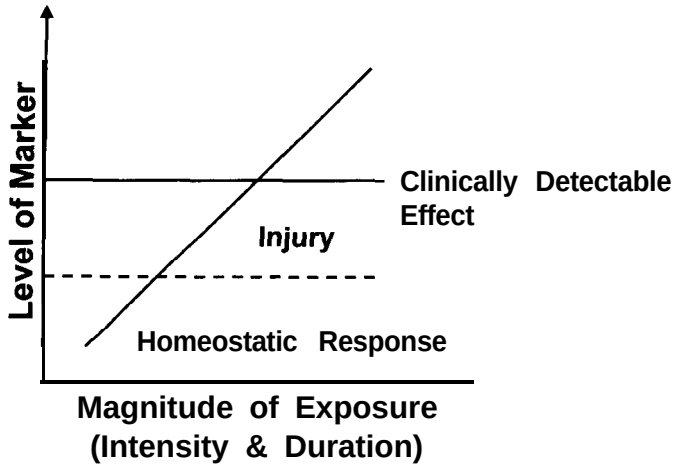


figure 2. Schema for considering biomarkers of response.

impairment of oxygen-carrying capacity, and the risk for angina in the presence of ischemic heart disease. However, the interpretative value for the majority of the many promising new cytokine and genetic biomarkers remains to be established. Not only is it difficult to assess the value of many biomarkers for distinguishing between physiological, homeostatic responses and injury, but it is also difficult to judge the value of changes during short-term exposures for predicting ongoing injury or risk for longer-term clinical effects.

The committee concluded that the continued development of biomarkers is an important need because of their considerable potential not only for detecting the adverse effects of air pollution exposure, but also for aiding the determination of the types and levels of response that should be considered adverse. We often do not know in a parallel, iterative manner, whether the exploration and validation of biomarkers will unquestionably advance our understanding of the mechanisms of homeostatic and injury responses. At this time, however, few of the rapidly growing list of candidate biomarkers have been validated to such an extent that their responses can be used with confidence to define the point at which a response should be equated to an adverse effect warranting preventive measures. Thus, we presently have only a very modest ability to translate evidence from biomarkers directly into a taxonomy of adverse health effects. Consequently, the committee cautions that not all changes in biomarkers related to air pollution should be considered as indicative of injury that represents an adverse effect.

Quality of Life

Health, in its broadest definition, includes not only the absence of disease but the attainment of well-being. Since the preparation of the 198.5 statement, the National Institutes of Health, the Centers of Disease Control, the Food and Drug Administration, and the World Health Organization have broadened their perspective of health to incorporate the concept of health-related quality of life as a valid and important health outcome. Health-related quality of life (HRQL) refers to the individual's perception of well-being, and includes such factors as self-care functioning, mental health, pain, and sense of overall well-being. Decreased health-related quality of life is widely accepted to be an adverse health effect. For this reason, measurable negative effects of air pollution on quality of life, whether for persons with chronic respiratory conditions or the population in general, were consequently considered by this committee to be adverse health effects. Air pollution exposure can adversely affect several domains of quality of life including physical functioning (particularly for persons with respiratory or cardiovascular conditions) and general well-being. Stinging, watery eyes resulting from air pollution not only reflect a chronic physical symptom but may decrease overall quality of life. Outdoor air pollution and odors have been associated with psychiatric symptoms, including anxiety and depression. Increased levels of some air pollutants have been reported to be associated with an increase in psychiatric admissions. The potential effects of air pollution and respiratory symptoms on different domains of quality of life are illustrated in Figure 3.

Measurement of the impact of air pollution on health-related quality of life can be accomplished either by measuring specific domains that may be influenced by air quality (e.g., anxiety, functional status), or by using specific quality of life instruments designed to measure multiple health-related domains (e.g., MOS-SF-36, St. George's Respiratory Questionnaire). The cost-benefits of improved air quality on health-related quality of life could also be measured by the use of quality of life measures that employ utility rating scales. The effects of air pollution of a magnitude considered to be clinically significant with these instruments should be regarded as adverse in interpreting evidence on the health effects of air pollution, regardless of the affected dimension. Additional research is needed to develop an information base for interpreting data from new and more sensitive instruments directed specifically at air pollution.

Physiological impact

The 198.5 statement acknowledged a distinction between reversible and irreversible effects. Healthy persons may sustain transient reductions in pulmonary function associated with air pollution exposure, e.g., reduction of the forced vital capacity (FVC) with exercise at times of higher levels of ozone pollution. However, the committee recommends that a small, transient loss of lung function, by itself, should not automatically be designated as adverse. In drawing the distinction between adverse and nonadverse reversible effects, this committee recommended that reversible loss of lung function in combination with the presence of symptoms should be considered as adverse. This recommendation is consistent with the 1985 statement. The Environmental Protection Agency has also needed to address the interpretation of such data. The Envi-

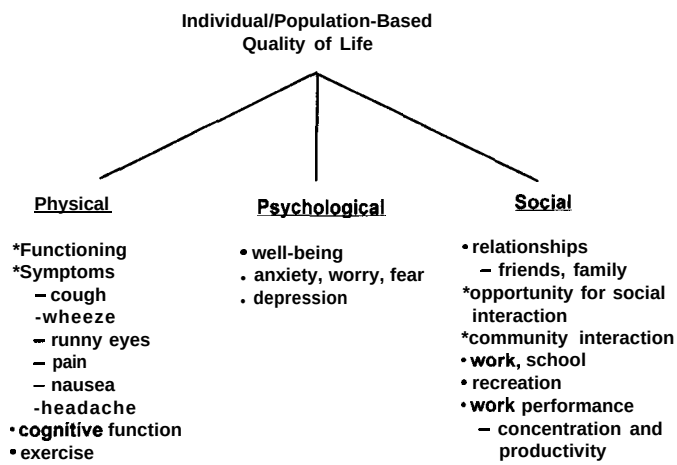


Figure 3. Quality of life domains vulnerable to the adverse health/respiratory effects of air pollution.

ronmental Protection Agency, in its 1989 review of ozone (20), offered a graded classification of lung function changes in persons with asthma. Reduction of the forced expiratory volume in 1 s (FEV_1) was graded as mild, moderate, or severe for reductions of less than 10%, 10–20%, and more than 20%, respectively. This classification has not been validated for acceptability or against other measures.

There is also epidemiologic evidence that air pollution may adversely affect lung growth or accelerate the age-related decline of lung function. Epidemiologic studies are limited in their power to detect such permanent effects and any evidence of association between air pollution exposure and permanent loss of function is indicative of an adverse effect at the population level. Some individuals may sustain clinically relevant, permanent losses of lung function. This committee considered that any detectable level of permanent lung function loss attributable to air pollution exposure should be considered as adverse.

Symptoms

Air pollution exposure can evoke symptoms in persons without underlying chronic heart or lung conditions and also provoke or increase symptom rates in persons with asthma and chronic obstructive lung disease. The Environmental Protection Agency also offered a scale for cough and pain on taking a deep breath in its 1989 ozone review (20). "Infrequent cough" was classified as "None/Normal."

Do all levels of increased symptom occurrence constitute an adverse health effect? The committee judged that air pollution-related symptoms associated with diminished quality of life or with a change in clinical status should be considered as adverse at the individual level. Characterizing the degree of symptomatology associated with diminished quality of life is an appropriate focus for research and a topic that could be investigated using new approaches for assessing quality of life. A change in clinical status can be appropriately set in a medical framework as one requiring medical care or a change in medication. At the population level, any detectable increment in symptom frequency should be considered as constituting an adverse health effect.

Clinical Outcomes

A wide range of clinical outcome measures has been considered in relation to air pollution, including population-level effects, such as increases in numbers of emergency room visits for asthma or hospitalizations for pneumonia, and individual-level effects, such as increased need for bronchodilator therapy. The present committee shared the view of the previous group: detectable effects of air pollution on clinical measures should be considered adverse.

At the population level, the magnitude of the detectable air pollution effect will depend on the extent of the data available for evaluation and methodological aspects of the data, including the degree of error affecting exposure and outcome variables. With large databases, seemingly modest effects may be detectable. However, the committee recommends that no level of effect of air pollution on population-level clinical indicators can be considered acceptable.

Mortality

Following the development of new approaches for the analysis of time-series data, extensive analyses have now been reported on the relationship between daily mortality counts and levels of air pollution on the same or prior days. Several prospective cohort studies have also addressed the effect of longer-term indicators of air pollution exposure on mortality, controlling for relevant individual factors, including age, sex, cigarette smoking, and occupational exposures, among others. Cross-sectional studies-comparing mortality across locations having different levels of air pollution while controlling for a variety of potential confounding factors-have also been conducted. The air pollution-associated mortality findings figured prominently in the recent revision of the U.S. NAAQS for particulate matter.

Associations between air pollution levels and daily mortality counts have been interpreted by some as reflecting the impact of air pollution on a pool of frail individuals with severe underlying heart or lung disease. One explanation for the day-to-day associations attributes them to a brief advancement of the time of death for extremely frail individuals who would have been expected to die soon even in the absence of an air pollution-related insult (21). Work has shown, however, that while this phenomenon of advancement, referred to as mortality displacement, may occur, it cannot provide a full explanation of the associations repeatedly found between daily fluctuations of air pollution and mortality (22, J. Schwartz, "Harvesting and long term exposure effects in the relationship between air pollution and mortality" [1999, unpublished manuscript]). In addition, some mortality time-series studies have found effects across all age strata, not just among the elderly or the very young, suggesting potentially substantial effects on person-years of life lost. Finally, studies of long-term exposures have shown a gradient of mortality risk from cardiopulmonary disease as well as differences in life expectancy across cities with different long-term pollution levels. Thus, although we still have little insight into the extent to which mortality displacement occurs, the evidentiary ensemble from several types of study designs consistently shows that air pollution can shorten the life span to an unacceptable degree.

Risk Assessment

Since the publication of the 1985 statement, quantitative risk assessment has emerged as a key tool for summarizing information on risks to health from environmental agents. Quantitative risk assessment offers a framework for organizing information on risks within its four elements: hazard identification, exposure assessment, dose-response assessment, and risk characterization. The findings of a risk assessment, encompassed in the risk characterization component, may include an overall assessment of impact, a description of the distribution of risk in the population, and an evaluation of risk for susceptible persons within the population. Quantitative risk assessment has been a cornerstone in evaluating risks of environmental carcinogens and we anticipate increasing application to non-carcinogenic health effects of environmental agents, including air pollution.

In interpreting the findings of risk assessments, guidance can be found in precedents offered by key interpretations of regulatory requirements, including the Supreme Court's decision on the benzene standard proposed by the Occupational Safety and Health Administration, and in pollutant-specific regulatory actions. Risks may be couched as the numbers of attributable events in the population and also as the level of risk incurred by individual members of the population.

The committee recognized the rising use and potential utility of quantitative risk assessment in characterizing the health effects of air pollution. However, the committee noted that the results of quantitative risk assessment can often be sensitive to assumptions regarding the distribution and magnitude of exposure, the choice of an appropriate dose-response relationship, and other input decisions. Judgments on acceptability of risk are societal and made through complex regulatory

processes involving extensive public input. The committee did not consider that its mandate extended to offering specific guidance on acceptable risk levels for populations or individuals, nor is risk assessment an appropriate basis for determining what constitutes an adverse effect.

CONCLUSIONS

Since the preparation of the 1985 statement of the American Thoracic Society, there have been tremendous advances in the scientific methods used to investigate the health effects of air pollution. These advances range from the molecular to the behavioral levels of inquiry. As a result, this statement covers topics that are new since the 1985 statement. Yet, this committee, like the 1985 group, was confronted by a lack of formal research or investigation on the very topic of this statement: the boundary between adverse and nonadverse effects. Consequently, the committee needed to exercise its collective judgment on matters that should be based in some broader, societal decision-making **process. Its recommendations are summarized below.**

- ***Biomarkers.*** Few of the rapidly growing list of candidate biomarkers have been validated sufficiently that their responses can be used with confidence to define the point at which a response should be equated to an adverse effect warranting preventive measures. The committee cautions that not all changes in biomarkers related to air pollution should be considered as indicative of injury that represents an adverse effect.
- ***Quality of life.*** Decreased health-related quality of life is widely accepted as an adverse health effect. For this reason, measurable negative effects of air pollution on quality of life, whether for persons with chronic respiratory conditions or for the population in general, were consequently considered to be adverse by this committee.
- ***Physiological impact.*** The committee recommends that a small, transient loss of lung function, by itself. should not automatically be designated as adverse. In drawing the distinction between adverse and nonadverse reversible effects, this committee recommended that reversible loss of lung function in combination with the presence of symptoms should be considered adverse. This committee considered that any detectable level of permanent lung function loss attributable to air pollution exposure should be considered adverse.
- ***Symptoms.*** The committee judged that air pollution-related symptoms associated with diminished quality of life or with a change in clinical status should be considered adverse at the individual level.
- ***Clinical outcomes.*** The present committee shared the view of the previous group: detectable effects of air pollution on clinical measures should be considered as adverse.
- ***Mortality.*** This committee agreed with the conclusion articulated by the 1985 group that any effect on mortality should be judged as adverse. In addition, we are now faced with the challenge of interpreting the findings of time-series studies of effects on short time frames. In interpreting this type of evidence, consideration needs to be given to the extent of life-shortening underlying the association.
- ***Population health versus individual risk.*** Assuming that the relationship between the risk factor and the disease is causal, the committee considered that such a shift in the risk factor distribution, and hence the risk profile of the exposed population, should be considered adverse, even in the absence of the immediate occurrence of frank illness.

This statement was prepared by an ad-hoc committee of the Assembly on Environmental and Occupational Health. Members of the committee are:

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References

1. **U.S. Environmental Protection** Agency (EPA). 1993. National Air Quality and Emissions Trends Report, 1992. Office of Air and Radiation/ Office of Air Quality Planning and Standards, Research Triangle Park, NC. Report No. EPA-454/R-93-031.
2. American Thoracic Society, Committee of the Environmental and Occupational Health Assembly, R. Bascom, P. A. Bromberg, D. A. Costa, R. Devlin, D. W. Dockery, M. W. Frampton, W. Lambert, J. M. Samet, F. E. Speizer, and M. Utell. 1996. Health effects of outdoor air pollution. Part 1. *Am. J. Respir. Crit. Care Med.* 153:3–50.
3. American Thoracic Society, Committee of the Environmental and Occupational Health Assembly, R. Bascom, P. A. Bromberg, D. A. Costa, R. Devlin, D. W. Dockery, M. W. Frampton, W. Lambert, J. M. Samet, F. E. Speizer, and M. Utell. 1996. Health effects of outdoor air pollution. Part 2. *Am. J. Respir. Crit. Care Med.* 153:477–498.
4. McMichael, A. J. 1995. Planetary Overload: Global Environmental Change and the Health of the Human Species. Cambridge University Press, New York.
5. World Health Organization, United Nations Environment Programme. 1992. Urban Air Pollution in Megacities of the World. Blackwell Publishers, Oxford.
6. American Thoracic Society. 1985. Guidelines as to what constitutes an adverse respiratory health effect, with special reference to epidemiologic studies of air pollution. Am. *Rev.* Respir. *Dis.* 131:666–669.
7. World Health Organization (WHO). 1958. Definition of Adverse Effect according to the Report of the WHO: Air Pollution, Fifth Report of the Expert Committee on Environmental Sanitation. World Health Organization, Geneva. Technical Report Series No. 157.
8. World Health Organization (WHO). 1972. Definition of Adverse Effect according to the Report of the WHO: Air Quality Criteria and Guides for Urban Air Pollutants. World Health Organization. Geneva. Technical Report Series No. 506.
9. World Health Organization (WHO). 1978. Distinctions between **Adverse** and Non-adverse Effects according to EHC 6: Principles and Methods for Evaluating the Toxicity of Chemicals. World Health Organization, Geneva.
10. World Health Organization (WHO). 1987. Air Quality Guidelines for Europe, European Series No. 23. World Health Organization, Copenhagen.

11. Leplege. A., and S. Hunt. 1997. The problem of quality of life in medicine. *J. Am. Med. Assoc.* 278:47–50.
12. Bergner, M., R. A. Bobbitt, W. B. Carter, and B. S. Gibson. 1981. The Sickness Impact Profile: development and final revision of a health status measure. *Med. Care* 19:787–804.
13. Guyatt, G. H., D. H. Feeny, and D. L. Patrick. 1993. Measuring health-related quality of life. *Ann. Intern. Med.* 1181622629.
14. McHorney, C. A., J. E. Ware, and A. E. Raczek. 1993. The MOS 36-item short-form health survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. Med. Care 31:247–263.
1.5. Institute of Medicine. 1999. Toward Environmental Justice: Research, Education. and Health Policy Needs. National Academy Press, Washington, DC.
16. Rose, G. 1992. The Strategy of Preventive Medicine, Oxford University Press, Oxford.
17. National Research Council (NRC), Commission on Life Sciences, Board on Toxicology and Environmental Health Hazards, and Committee on the Epidemiology of Air Pollutants. 1985. Epidemiology and Air Pollution. National Academy Press, Washington, DC.
18. Crystal, R. G. 1997. The Lung: Scientific Foundations, Lippincott-Raven, Philadelphia.
19. Mendelsohn, M. L., L. C. Mohr, and J. P. Peeters. 1998. Biomarkers: Medical and Workplace Applications. Joseph Henry Press, Washington, DC.
20. U.S. Environmental Protection Agency (EPA). 1989. Review of the National Ambient Air Quality Standard for Ozone, Assessment of Scientific and Technical Information. EPA, Research Triangle Park, NC. EPA-450/2-92.
21. U.S. Environmental Protection Agency, Air Quality Strategies and Standards Division. 1998. Revised Ozone and Particulate Matter (PM) National Ambient Air Quality Standards. U.S. Environmental Protection Agency, Washington, DC.
22. Zeger, S. L., F. Dominici, and J. Samet. 1999. Harvesting-resistant estimates of air pollution effects on mortality. *Epidemiology* 10:171–175.

San Joaquin Valley
Air Pollution Control District

Zero Equivalency Policy
for
Greenhouse Gases

Approved By:	Signed David Warner Director of Permit Services	Date:	**March 24, 2010** **Revised January 24, 2012**

Purpose:

The purpose of this policy is to detail how small increases in greenhouse gas (GHG) emissions for permitted sources are handled during the application review process. This policy establishes a level below which project specific increases in greenhouse gas emissions are considered equivalent to zero for District permitting purposes. Establishment of this policy maximizes reductions in GHG emissions and improves efficiencies in the permitting process by identifying projects which have no potential to achieve substantial GHG emission reductions.

I. Applicability

This guidance is to be followed when processing Authority to Construct (ATC) applications for projects with potential increases in greenhouse gas emission and the District serves as Lead Agency for CEQA purposes.

II. Background

The California Environmental Quality Act (CEQA) and CEQA Guidelines require agencies to adopt procedures and guidelines for implementing CEQA. Consistent with those requirements, the District adopted its *Environmental Review Guidelines* (ERG), which provides District staff with guidance for streamlining the District's permitting process while assuring that environmental impacts related to District actions are thoroughly and consistently addressed. The ERG establishes specific District permitting actions which are ministerial approvals and not subject to CEQA; identifies specific permitting actions that have been determined to qualify for exemption under the "General Rule" that CEQA does not apply where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment; and identifies certain classes of projects that are most frequently categorically exempt from the provisions of CEQA.

On December 17.2009, the Valley Air District's Governing Board adopted the adopted the *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The policy adopted December 17, 2009, applies to all District permitting projects that have an increase in GHG emissions, regardless of the magnitude of the increase. The adopted policy establishes the use of performance based standards (Best Performance Standards) as a means of determining the cumulative significance of project specific greenhouse gas emissions on global climate change. The policy requires District staff to establish Best Performance Standards (BPS) for each class and category of stationary source emissions and to evaluate the cumulative significance of project specific greenhouse gas emissions on global climate change. However, the policy also establishes that projects exempt from CEQA are not subject to further environmental review for greenhouse gas impacts.

It is conceivable that at least some projects which qualify for exemption per the District's adopted Environmental Review Guidelines will have some increase in greenhouse gas emissions. To ensure that these projects receive further environmental consideration and to ensure consistency in processing such ATC applications, this policy establishes a level of greenhouse emissions below which project specific increases in greenhouse gas emissions would be considered equivalent to zero for CEQA purposes. Projects with increases in greenhouse emissions that are non-zero would require further environmental review for greenhouse gas impacts.

To establish a zero equivalency level, the District considered greenhouse gas emissions associated with stationary sources that are so small that they are not subject to District prohibitory rules or District permit requirements. As indicated in the attached analysis, District staff evaluated greenhouse emissions from two permit-exempt emission sources; 5-mmbtu/hr gas-fired boilers and 50-horsepower diesel engines. The permit-exempt boiler has the potential to emit of more than 2,300 metric tons-CO_2e/year, while the permit-exempt internal combustion engine emitted slightly more than 230 metric tons-CO_2e/year

Therefore, choosing the more conservatively low of the two sources, the zero equivalency level is established at 230 metric tons-CO_2e/year.

III. Air District CEQA Implementation:

Greenhouse gas emissions of 230 metric tons-CO_2e/year or less are considered to be zero for District permitting purposes. When an Authority to Construct (ATC) application is received, and the District is the Lead Agency, District staff will follow established District policy and Environmental Review Guidelines to determine if the project is exempt from further environmental analysis. If the project would be exempt from further environmental review and if potential increases in stationary source greenhouse gas emissions are zero, the project will be determined to be exempt from further environmental review and the ATC will be processed consistent with existing District policies and procedures. Projects not meeting the above conditions will receive further environmental review, consistent with established District CEQA guidance.

Attachment A – GHG Emission Rate Evaluation for Two Permit-Exempt Equipment Categories

The District has evaluated potential greenhouse gas emissions from 1) internal combustion engines rated at 50 brake horsepower and 2) natural gas-fired boilers with a rated firing capacity of 5 MMBtu/hour.

50 bhp Internal Combustion Engine

Basis and Assumptions

- The engine is a compression-ignited unit fueled with diesel in agricultural equipment service.
- The engine operates at full rated power.
- Specific fuel consumption is 220 g/kWh (typical for engine type).
- Density of diesel fuel is 7.0 lb/gallon.
- Higher Heating Value (HHV) of diesel is 138,700 Btu/gallon.
- Engine operates 8,760 hours per year.
- Emission factors and global warming potentials (GWP) for diesel fuel are taken from the California Climate Change Action Registry (CCAR), Version 3.1, January, 2009 (Appendix C, Tables C.1, C.3 and C.6) :

  CO2 10.15 kg/gallon (22.3 lb/gallon)
  CH4 1.44 g/gallon (0.006 lb/gal)
  N2O 0.26 g/gallon (0.001 lb/gal)

  GWP for CH4 = 21 lb-CO_2e per lb-CH4
  GWP for N2O = 310 lb-CO_2e per lb-N2O

Calculations

Diesel fuel consumption rate at full rated horsepower:

$$\frac{50}{\text{bhp}} \times \frac{0.7456\ \text{kW}}{\text{hp}} \times \frac{220\ \text{g}}{\text{kWh}} \times \frac{1\ \text{lb}}{453.6\ \text{g}} \times \frac{\text{gal}}{7\ \text{lb}} = 2.58\ \text{gal/hour}$$

Hourly Emissions

CO2 Emissions = 2.58 gal/hr x 22.3 lb/gal = 57.5 lb-CO_2e/hour
CH4 Emissions = 2.58 gal/hr x 0.006 lb/gal x 21 lb-CO_2e per lb-CH4 = 0.3 lb-CO_2e/hour
N2O Emissions = 2.58 gal/hr x 0.001 lb/gal x 310 lb-CO_2e per lb-N2O = 0.8 lb-CO_2e/hour

Total = 57.5 + 0.3 + 0.8 = 58.6 lb-CO_2e/hour

Annual Emissions

58.6 lb-CO_2e/hour x 8,760 hr/year ÷ 2,000 lb/ton = 257 short tons-CO_2e/year

Metric Conversion

257 short tons-CO_2e/year x 0.9072 metric tons/short ton = **233 metric tons**

5 MMBtu/hour Boiler

Basis and Assumptions

- The boiler is fired with natural gas at a rate of 5 MMBtu/hour (HHV)
- The boiler operates 8,760 hours per year and is in commercial/institutional service
- Emission factors and global warming potentials (GWP) are taken from the California Climate Change Action Registry (CCAR), Version 3.1, January, 2009 (Appendix C, Tables C.7 and C.8):

  CO2 53.06 kg/MMBtu (HHV) natural gas (116.7 lb/MMBtu)
  CH4 0.005 kg/MMBtu (HHV) natural gas (0.011 lb/MMBtu)
  N2O 0.0001 kg/MMBtu (HHV) natural gas (0.00022 lb/MMBtu)

  GWP for CH4 = 21 lb-CO_2e per lb-CH4
  GWP for N2O = 310 lb-CO_2e per lb-N2O

Calculations

Hourly Emissions

CO2 Emissions = 5.0 MMBtu/hr x 116.7 lb/MMBtu = 583.5 lb-CO_2e/hour
CH4 Emissions = 5.0 MMBtu/hr x 0.011 lb/MMBtu x 21 lb-CO_2e per lb-CH4 = 1.2 lb-CO_2e/hour
N2O Emissions = 5.0 MMBtu/hr x 0.00022 lb/MMBtu x 310 lb-CO_2e per lb-N2O = 0.3 lb-CO_2e/hour

Total = 583.5 + 1.2 + 0.3 = 585.0 lb-CO_2e/hour

Annual Emissions

585.0 lb-CO_2e/hour x 8,760 hr/year ÷ 2,000 lb/ton = 2,562 tons-CO_2e/year

Metric Conversion

2,562 short tons-CO_2e/year x 0.9072 metric tons/short ton = **2,324 metric tons**

San Joaquin Valley
Air Pollution Control District

APR - 2025

CEQA Determinations of Significance for Projects Subject to ARB's GHG Cap-and-Trade Regulation

Approved By:	Arnaud Marjollet, Director of Permit Services	Date:	June 25, 2014

I. Purpose:

The District has a statutory obligation to fully comply with the provisions of CEQA before issuing an Authority to Construct (ATC). The purpose of this policy is to provide guidance to District staff on how to determine significance of greenhouse gas (GHG) emissions from projects subject to the California Air Resources Board Cap-and-Trade regulation or occurring at entities subject to the California Air Resources Board Cap-and-Trade regulation.

II. Applicability:

This policy is to be followed when processing ATC applications and when providing technical guidance to lead agencies and the public regarding significance of project specific GHG emissions.

III. Background:

Assembly Bill 32 (AB32)

Assembly Bill 32 (California Global Warming Solutions Act of 2006) is a key piece of California's effort to reduce its GHG emissions. AB32 requires the California Air Resources Board (ARB) to establish regulations designed to reduce California's GHG emissions to 1990 levels by 2020. On December 11, 2008, ARB adopted its AB32 Scoping Plan, setting forth a framework for future regulatory action on how California will achieve that goal through sector-by-sector regulation.

Cap-and-Trade

The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California will employ to reduce the greenhouse gas (GHG) emissions that cause climate change. The Cap-and-Trade program is implemented by the California Air Resources Board and caps GHG emissions from the industrial, utility, and transportation fuels sectors – which account for roughly 85% of the state's GHG emissions.

The program works by establishing a hard cap on about 85 percent of total statewide greenhouse gas emissions. The cap starts at expected business-as-usual emissions levels in 2012, and declines 2-3% per year through 2020. Fewer and fewer GHG emissions allowances are available each year, requiring covered sources to reduce their emissions or pay increasingly higher prices for those allowances. The cap level is set in 2020 to ensure California complies with AB 32's emission reduction target of returning to 1990 GHG emission levels.

The scope of GHG emission sources subject to Cap-and-Trade in the first compliance period (2013-2014), includes:

- All electricity generated and imported into California. The first deliverer of electricity into the state is the capped entity (the one that will have to purchase and surrender allowances).
- Large industrial facilities emitting more than 25,000 metric tons of GHG pollution/year. Examples include oil refineries and cement manufacturers.

The scope of GHG emission sources subject to Cap-and-Trade during the second compliance period (2015-2017), expands to include distributors of transportation fuels (including gasoline and diesel), natural gas, and other fuels. The regulated entity will be the fuel provider that distributes the fuel upstream (not the gas station). In total, the Cap-and-Trade program is expected to include roughly 350 large businesses, representing about 600 facilities. Individuals and small businesses will not be regulated.

Under the program, companies do not have individual or facility-specific reduction requirements. Rather, all companies covered by the regulation are required to turn in allowances in an amount equal to their total greenhouse gas emissions during each phase of the program. The program gives companies the flexibility to either trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more will have to turn in more allowances. Companies that can cut their emissions will have to turn in fewer allowances. Furthermore, as the cap declines, total GHG emissions are reduced.

On October 20, 2011, ARB's Board adopted the final Cap-and-Trade regulation and Resolution 11-32. As part of finalizing the regulation, the Board considered the related environmental analysis and, consistent with CEQA requirements, approved ARB's functionally equivalent document (FED).

CEQA Requirements

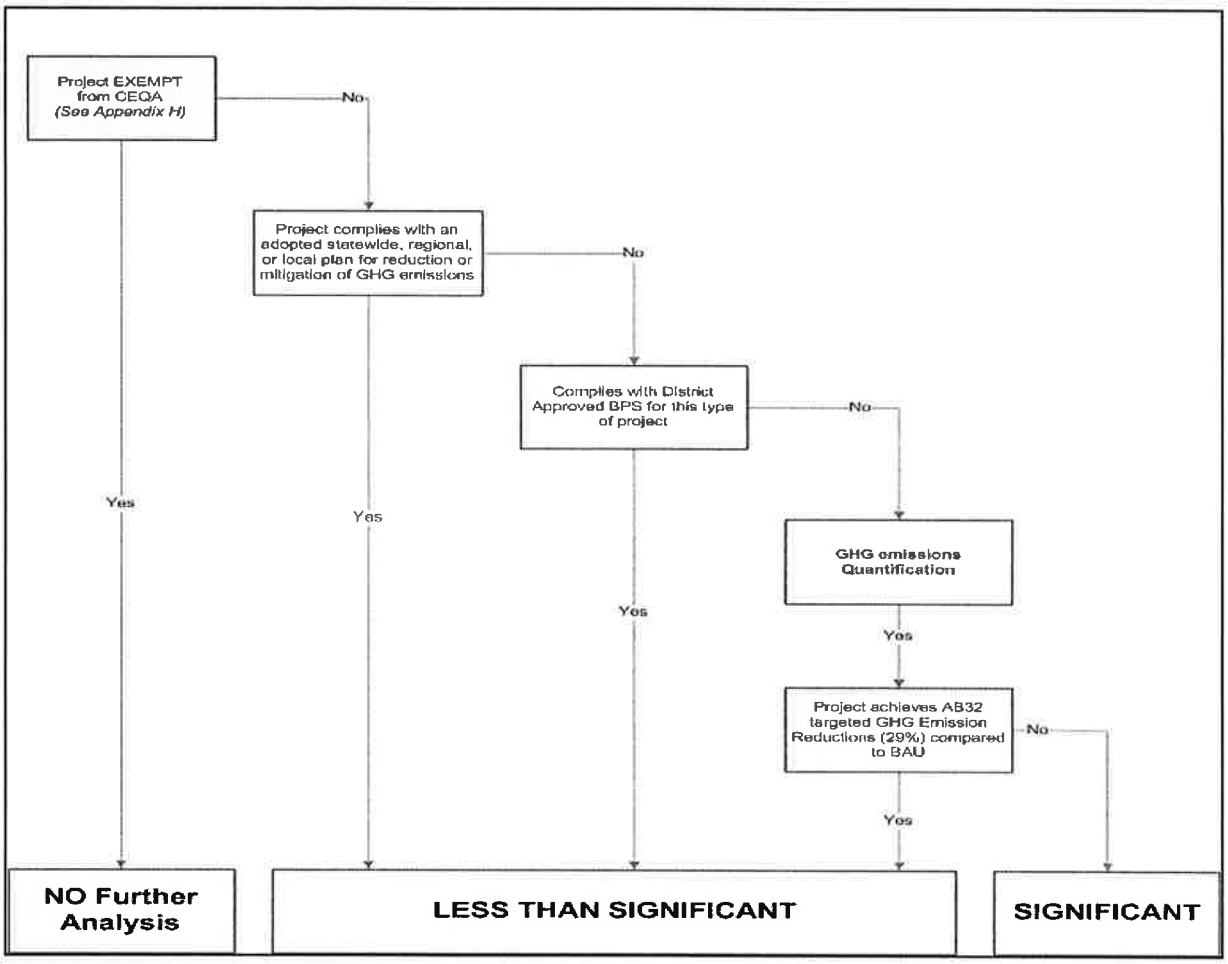
In December, 2009, the California Natural Resources Agency (NRA) amended the CEQA Guidelines to include Global Climate Change (GCC), which is now generally accepted by the scientific community to be occurring and caused by Greenhouse Gases (GHG). The amendments address analysis and mitigation of the potential effects of GHG emissions in CEQA documents. In their *Final Statement of Reasons for Regulatory Action,* NRA recognizes that the analysis of GHG emissions in a CEQA document presents unique challenges to lead agencies. NRA amended section 15064(h)(3) of the CEQA guidelines to add compliance with plans or regulations for the reduction of greenhouse gas emissions to the list of plans and programs that may be considered in a cumulative impacts analysis. In their *Final Statement of Reasons for Regulatory Action*, NRA discusses that AB32 requires ARB to adopt regulations that achieve the maximum technologically feasible and cost effective GHG reductions to reach the adopted state-wide emissions limit. NRA goes on to state that a lead agency may consider whether ARB's GHG reduction regulations satisfy the criteria in existing subdivision (h)(3).

District CEQA Policy

CEQA requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. On December 17, 2009, the District's Governing Board adopted the District's policy, APR 2005, *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency,* for addressing GHG emission impacts when the District is Lead Agency under CEQA and approved the District's guidance document for use by other agencies when addressing GHG impacts as lead agencies under CEQA. Under this policy, the District's determination of significance of project-specific GHG emissions is founded on the principal that projects with GHG emission reductions consistent with AB 32 emission reduction targets are considered to have a less than significant impact on global climate change.

As illustrated in Figure 1, the District's board-adopted policy for determining significance of project-specific GHG emissions employs a tiered approach. Of specific relevance to Cap-and-Trade is the provision that: "Projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located, would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement best performance standards (BPS)". Projects that do not comply with such a plan or program must implement best performance standards or undergo a project-specific analysis demonstrating that GHG emissions would be reduced by at least 29%, as compared to business-as-usual.

Figure 1: Determination of Significance for Stationary Source Projects



IV. Determination of Significance of GHG Emissions for Projects Subject to ARB's GHG Cap-and-Trade Regulation:

Significant GHG Emission increases under CEQA

The District has determined that GHG emissions increases that are covered under ARB's Cap-and-Trade regulation cannot constitute significant increases under CEQA, for two separate and distinct reasons:

1. *Cap-and-Trade Regulation is an Approved GHG Emissions Reduction Plan:*

   As discussed above, ARB's Cap-and-Trade regulation is an adopted statewide plan for reducing or mitigating GHG emissions from targeted industries and is supported by an environmental review process that has been successfully defended in court as equivalent to, and compliant with, CEQA requirements.

   Consistent with CCR §15064(h)(3), the District finds that compliance with ARB's Cap-and-Trade regulation would avoid or substantially lessen the impact of

project-specific GHG emissions on global climate change. The District also finds that the ARB's Cap-and-Trade regulation was supported by an appropriate CEQA-equivalent analysis. The District therefore concludes that GHG emissions increases subject to ARB's Cap-and-Trade regulation would have a less than significant individual and cumulative impact on global climate change., and

2. *Cap-and-Trade Regulation Requires Mitigation of GHG Increases:*

   GHG emissions addressed by the Cap-and-Trade regulation are subject to an industry-wide cap on overall GHG emissions. As such, any growth in emissions must be accounted for under that cap, such that a corresponding and equivalent reduction in emissions must occur to allow any increase. Further, the cap decreases over time, resulting in an overall decrease in GHG emissions. Therefore, it is reasonable to conclude that implementation of the Cap-and-Trade program will and must fully mitigate project-specific GHG emissions for emissions that are covered by the Cap-and-Trade regulation.

Regardless of and independent to the significance determination made above, the District finds that, through compliance with the Cap-and-Trade regulation, project-specific GHG emissions that are covered by the regulation will be fully mitigated. The District therefore concludes that GHG emissions increases subject to ARB's Cap-and-Trade regulation would have a less than significant individual and cumulative impact on global climate change.

Entities Covered by this Policy

Industries covered by Cap-and-Trade are identified in the regulation under section 95811, *Covered Entities:*

1. *Group 1: Large industrial facilities*

   These types of facilities are subject to compliance obligations starting in 2013, and the specific companies covered are listed at http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm, Section 95811 (a), under the "Publically Available Market Information" section (list maintained by the California Air Resources Board,).

2. *Group 2: Electricity generation facilities located in California, or electricity importers*

   These types of facilities are subject to Cap and Trade (section 95811, b), with compliance obligations starting in 2013 (section 95851, a).

3. *Group 3: Suppliers of Natural Gas, Suppliers of Reformulated Gasoline Blendstock for Oxygenate Blending and Distillate Fuel Oil, Suppliers of Liquefied Petroleum Gas, and Suppliers of Blended Fuels*

   These entities are subject to compliance obligations starting in 2015, which obligations must cover all fuels (except jet fuels) identified in section 95811 (c) through (f) of the Cap-and-Trade regulation delivered to end users in California, less the fuel delivered to covered entities (group 1 above).

Under Cap-and-Trade regulation, the program expands to also include fuel distributors. As a result, combustion of fossil fuels including transportation fuels used in California (on and off road including locomotives), not directly covered at large sources, are subject to Cap-and-Trade requirements, with compliance obligations starting in 2015.

Fuel Supplier/Distributor Applicability Threshold

The threshold for a fuel supplier/distributor (Group 3) to be subject to the Cap-and-Trade regulation is 25,000 MT CO2e per year from the emissions of GHG that would result from the combustion or oxidation of the quantities of the specific fuels imported and/or delivered to California by the individual fuel supplier. Consequently, entities supplying fuels that would result in less than 25,000 MT CO2 annual GHG emissions are not subject to the Cap-and-Trade regulation.

Based on ARB's Reporting and Verification Summary, in the year 2012, there were 219 fuel suppliers in California not subject to the Cap-and-Trade regulation. Based on this data, and using the applicability threshold, the District has conservatively estimated that the GHG emissions resulting from the combustion of all fuels supplied by those fuel suppliers not subject to the Cap-and-Trade regulation would represent less than 1.0 % of the State's total Annual GHG emissions. As did the ARB when excluding such sources from the Cap-and-Trade regulation, the District considers GHG emissions resulting from the combustion of all fuels supplied by those fuel suppliers not subject to the Cap-and-Trade regulation to be insignificant. Therefore, it is reasonable to apply this policy to GHG emissions resulting from the combustion of all fuels in the State of California.

GHG Baseline Emissions and GHG Emission Increases

The GHG baseline emission levels of covered entities identified in Cap-and-Trade were established with the original Cap-and-Trade regulation. In addition, under Cap-and-Trade requirements, in order to maintain their GHG emissions below the established cap, facilities identified under "covered entities" are subject to mitigation requirements. Therefore, for the intent of this policy, under Cap-and-Trade requirements, mitigation is required for all GHG emission increases from "covered facilities".

V. Conclusion:

In conclusion, all GHG emission increases resulting from the combustion of any fuel produced, imported and/or delivered in California are mitigated under Cap-and-Trade, either directly by facilities identified under groups 1 or 2 (*section 95811(a) and (b)*), or by fuel suppliers identified under the group 3 (*section 95811(c) through (f)*). Therefore, GHG emission increases caused by fuel use (other than jet fuels) are determined to have a less than significant impact on global climate change under CEQA.

APPENDIX C

EXCAVATION AND OPERATION PHASE EMISSIONS CALCULATIONS

Criteria Pollutants, Toxic Air Contaminants and Greenhouse Gasses

1. Emissions Calculations (Average Year)
2. Emissions Calculations (Average Year, Mitigated)
3. Emissions Calculations (Maximum Year)
4. Emissions Calculations (Maximum Year, Mitigated)

	Baseline Tonnage		Project Tonnage		Recycle Plant Tonnage - Baseline and Excavation
	Gross	Net	Gross	Net	
Annual	714,286	500,000	714,286	500,000	100,000
Daily	6,000	4,000	6,000	7,000	2,600
Houlry	1,000	650	1,000	700	350

Average Emissions (Pre-mitigation)

		Baseline (lbs/year) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									236.68	69.11	236.68	69.11	0
	Recycle Engine	339.22	1,286.39	3,587.14	24.13	120.64	121	268,869.08	30.28			120.64	120.64	269,716.90
	Aggregates Plant Fugitive Ems.									54	16	54.00	15.77	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000	4,380	0
	Excavation Offroad Engines	1,717	6,417	17,482	127	688	688	1,417,326	153			688	688	1,421,623
	Aggregates Transfer/Drops									1,244	363	1,244	363	0
	Off-Road Vehicle Haul	1,439	4,951	14,985	110	561	561	1,207,587	130	10,631	2,254	11,192	2,815	1,211,216
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**3,495**	**12,655**	**36,054**	**262**	**1,370**	**1,370**	**2,893,782**	**313**	**27,935**	**7,306**	**29,304**	**8,676**	**2,902,556**

		Baseline (lbs/day) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6.15	1.80	6.15	1.80	0.00
	Recycle Engine	16.62	63.03	175.77	1.18	5.91	6	13,174.59	1.48			5.91	5.91	13,216.13
	Aggregates Plant Fugitive Ems.									0.43	0.13	0.43	0.13	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Excavation Offroad Engines	17.6	67.3	182.1	1.3	7.0	7.0	14,719.7	1.6			7.00	7.00	14,764
	Aggregates Transfer/Drops									10	3	9.95	2.91	0
	Off-Road Vehicle Haul Emissions	10	33	99	1	4	4	7,998	1	99	21	102.57	24.67	8,022
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**44**	**163**	**457**	**3**	**17**	**17**	**35,893**	**4**	**244**	**63**	**260**	**80**	**36,002**

		Baseline (lbs/hr) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									0.83	0.24	0.83	0.24	0.00
	Recycle Engine	1.19	4.50	12.55	0.08	0.42	0.42	941.04	0.11			0.42	0.42	944.01
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Excavation Offroad Engines	1.4	5.1	13.6	0.1	0.6	0.6	1,098.2	0.1			0.56	0.56	1,102
	Aggregates Transfer/Drops									2	0	1.62	0.47	0
	Off-Road Vehicle Haul Emissions	1	2	7	0.1	0.3	0.3	571	0.06	16	3	16.33	3.67	573
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**3**	**12**	**33**	**0**	**1**	**1**	**2,611**	**0**	**40**	**10**	**41**	**12**	**2,619**

*CO2e Calculated based on IPCC Fifth Assessment Report (AR5)
Assumes GWP factor of: 28 for Methane

Average Emissions (Pre-mitigation)

		Years 1 - 20 (lbs/year) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									237	69	236.68	69.11	0.00
	Recycle Engine	114	512	1,707	2	37	37	268,870	10			37.38	37.38	269,147.75
	Aggregates Plant Fugitive Ems.									50	15	50.14	14.64	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000.00	4,380.00	0
	Excavation Offroad Engines	576	3,520	5,484	12	203	187	1,170,868	378			202.57	187.00	1,181,450
	Aggregates Transfer/Drops									1,244	363	1,243.74	363.17	0
	Off-Road Vehicle Haul	623	4,112	5,669	11	225	208	1,005,065	325.11	21,261	4,507	21,487	4,716	1,014,169
	De-watering Pumps	277	1,542	1,517	3	76	76	208,844	24.99			75.70	75.70	209,543
	On-Road Vehicle Haul	1	15	208	1	0.25	0.2	133,436	0.06	84.88	17.99	85.12	18.23	133437.69
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**1,592**	**9,702**	**14,585**	**29**	**541**	**509**	**2,787,082**	**738**	**38,646**	**9,577**	**39,187**	**10,086**	**2,807,747**

		Years 1 - 20 (lbs/day) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6	2	6.15	1.80	0.00
	Recycle Engine	5.6	25.1	83.6	0.1	1.8	1.8	13,174.6	0.5			1.83	1.83	13,188.24
	Aggregates Plant Fugitive Ems.									1	0	0.70	0.20	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Excavation Offroad Engines	6.1	35.9	58.4	0.1	2.2	2.0	12,126.7	3.9			2.16	2.00	12,236
	Aggregates Transfer/Drops									17	5	17.41	5.08	0
	Off-Road Vehicle Haul Emissions	4	27	38	0.1	1	1	6,657	2.15	346.01	73.35	347.50	74.73	6,717
	De-watering Pumps	1.8	9.9	9.7	0.02	0.5	0.5	1,335	0.16			0.48	0.48	1,340
	On-Road Vehicle Haul	0.02	0.2	2.9	0.02	0.0	0.003	1,868	0.001	1.38	0.29	1.38	0.30	1868.12767
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**18**	**98**	**192**	**0**	**6**	**6**	**35,162**	**7**	**500**	**118**	**506**	**124**	**35,350**

		Years 1 - 20 (lbs/hr) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1	0.2	0.83	0.24	0.00
	Recycle Engine	0.40	1.79	5.97	0.01	0.13	0.13	941.04	0.03			0.13	0.13	942.02
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Excavation Offroad Engines	0.4	2.8	4.3	0.0	0.2	0.1	905.1	0.3			0.16	0.15	913
	Aggregates Transfer/Drops									1.7	0.5	1.74	0.51	0
	Off-Road Vehicle Haul Emissions	0	2	3	0	0	0	476	0.15	34.60	7.34	34.71	7.43	480
	De-watering Pumps	0.07	0.41	0.40	0.001	0.02	0.02	55.63	0.01			0.02	0.02	56
	On-Road Vehicle Haul	0.00	0.02	0.29	0.002	0.00035	0.00	186.81	0.00	0.14	0.03	0.14	0.03	186.812767
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**1**	**7**	**14**	**0**	**0**	**0**	**2,564**	**0**	**58**	**14**	**59**	**15**	**2,578**

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	Opp-Hour/Ton Processed	Load Factor	Hp-Hr/Ton Processed	Max Daily Opp-Hr
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.001501	0.36	0.29	14
	982 Loader	400	0.001501	0.36	0.22	14
	980 Loader	390	0.001501	0.36	0.21	14
	390 Excavator	530	0.001447	0.38	0.29	14
	Haul Truck	600	0.004227	0.38	0.96	14
	Haul Truck	600	0.004227	0.38	0.96	14
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	N/A*	0.37	N/A	2
	Telehandler/Aerial Lift	63	N/A*	0.31	N/A	2
	De-Watering Pump	30	N/A*	0.74	N/A	24
	De-Watering Pump	30	N/A*	0.74	N/A	24
	Water Truck	402	N/A*	0.38	N/A	14
	Total Non-Haul Engines, Non-Dewater					
	Total Haul Engines					
Permitted Emissions	**Recycle Generator Set**	1015	0.002857143	0.74	2.15	14
	Reservoir Pump Generator Set	600		0.74		8

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truck HP, which is based on Cat 772 or equivalent truck v

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is conservatively estimated based on the 2005 emission year (App D Table 3.4)

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conservatively estimated based on 2021 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based on cycle time calculations and tonnage throughput

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	Project		Baseline		Annual Operating Hours	Avg Daily Operating Hours
			Avg Annual Hp-Hr	Max Daily Hp-Hr	Avg Annual Hp-Hr	Max Daily Hp-Hr		
	988 Loader	540	208480	2721.6	208480	2721.6	386	1.23
	982 Loader	400	154430	2016	154430	2016	386	1.23
	980 Loader	390	150569	1965.6	150569	1965.6	386	1.23
Emissions Based On	**390 Excavator**	530	208165	2819.6	208165	2819.6	393	1.26
Cycle Time	**Haul Truck**	600	481922	3192	481922	3192	803	2.57
Analysis/Throughput	**Haul Truck**	600	481922	3192	481922	3192	803	2.57
	Skid Steer	65	15048	48.1	15048	48.1	626	2
	Telehandler/Aerial Lift	63	12220	39.06	12220	39.06	626	2
	De-Watering Pump	30	83345	532.8	0	0	3754	12
Emissions Based On	**De-Watering Pump**	30	83345	532.8	0	0	3754	12
Fixed Operational Hours	**Water Truck**	402	382336	2138.64	382336	2138.64	2503	8
	Total Non-Haul Engines, Non-Dewater							
	Total Haul Engines							
	Recycle Generator Set	1015	214600	10515.4	214600	10515.4	211	0.68
Permitted Emissions	**Reservoir Pump Generator Set**	600	174048	3552			392	

HP estimated based on CalEEMod App D for equipment that does not hwith 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions Factor (g/hp-hr) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.695	2.831	7.236	0.052	0.278	0.278	568.299	0.062
	982 Loader	400	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
	980 Loader	390	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
Emissions Based On	**390 Excavator**	530	0.64	2.192	6.888	0.052	0.251	0.251	568.299	0.057
Cycle Time	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
Analysis/Throughput	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
	Skid Steer	65	1.339	3.988	7.653	0.06	0.712	0.712	568.299	0.12
	Telehandler/Aerial Lift	63	1.34	3.898	8.079	0.059	0.651	0.651	568.299	0.12
	De-Watering Pump	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Emissions Based On	**De-Watering Pump**	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Fixed Operational Hours	**Water Truck**	402	0.669	2.332	6.848	0.05	0.26	0.26	568.299	0.06
	Total Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
	Recycle Generator Set	1015	0.717	2.719	7.582	0.051	0.255	0.255	568.299	0.064
Permitted Emissions	**Reservoir Pump Generator Set**	600								

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.271	1.39703	2.64092	0.005	0.102	0.094	462.0548	0.149
	982 Loader	400	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
	980 Loader	390	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
	390 Excavator	530	0.165	1.14978	1.61856	0.005	0.056	0.052	469.547	0.152
	Haul Truck	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
	Haul Truck	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
	Skid Steer	65	0.178	3.27687	2.36588	0.005	0.096	0.089	471.9774	0.153
	Telehandler/Aerial Lift	63	0.109	3.17624	1.74368	0.005	0.033	0.031	472.1142	0.153
	De-Watering Pump	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
	Water Truck	402	0.225	1.33781	1.95357	0.005	0.072	0.066	474.542	0.153
	Total Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.242	1.082	3.608	0.005	0.079	0.079	568.3	0.021
	Reservoir Pump Generator Set	600	0.191	1.005	1.858	0.005	0.056	0.056	568.299	0.017

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	144893.7	590207.4	1508563	10840.97	57957.49	57957.49	1.18E+08	12925.77
	982 Loader	400	105475.5	437962.8	1091201	7721.489	42468.19	42468.19	87762439	9420.216
	980 Loader	390	102838.6	427013.8	1063921	7528.451	41406.48	41406.48	85568378	9184.711
	390 Excavator	530	133225.8	456298.5	1433843	10824.6	52249.51	52249.51	1.18E+08	11865.43
	Haul Truck	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Haul Truck	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Skid Steer	65	20149.85	60013.13	115165.6	902.9057	10714.48	10714.48	8552007	1805.811
	Telehandler/Aerial Lift	63	16375.07	47634.34	98727	720.9918	7955.35	7955.35	6944727	1466.424
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	255783.1	891608.6	2618240	19116.82	99407.48	99407.48	2.17E+08	22940.19
	Total Non-Haul Engines, Non-Dewater		778741.8	2910739	7929660	57656.23	312159	312159	6.43E+08	69608.55
	Total Haul Engines		652523	2245759	6797035	50119.94	254455.1	254455.1	5.48E+08	58794.54
Permitted Emissions	**Recycle Generator Set**	1015	153868.2	583497.4	1627097	10944.6	54723	54723	1.22E+08	13734.4
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	56498.13	291253.1	550579.5	1042.401	21264.98	19597.14	96329273	31063.55
	982 Loader	400	40769.46	236157.1	403118.8	772.1489	14979.69	13898.68	72261968	23318.9
	980 Loader	390	39750.22	230253.2	393040.9	752.8451	14605.2	13551.21	70455419	22735.92
	390 Excavator	530	34347.29	239344.4	336928.1	1040.827	11657.26	10824.6	97743427	31641.14
	Haul Truck	600	141203.3	932626	1285760	2409.612	51083.78	47228.4	2.28E+08	73734.14
	Haul Truck	600	141203.3	932626	1285760	2409.612	51083.78	47228.4	2.28E+08	73734.14
	Skid Steer	65	2678.62	49311.74	35602.78	75.24214	1444.649	1339.31	7102518	2302.41
	Telehandler/Aerial Lift	63	1332.002	38814.29	21308.12	61.101	403.2666	378.8262	5769330	1869.691
	De-Watering Pump	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
	Water Truck	402	86025.7	511493.5	746921	1911.682	27528.22	25234.21	1.81E+08	58497.48
	Total Non-Haul Engines, Non-Dewater		261401.4	1596627	2487499	5656.247	91883.26	84823.97	5.31E+08	171429.1
	Total Haul Engines		282406.6	1865252	2571519	4819.225	102167.6	94456.81	4.56E+08	147468.3
			0	0	0	0	0	0	0	0
Permitted Emissions	**Recycle Generator Set**	1015	51933.2	232197.2	774276.8	1073	16953.4	16953.4	1.22E+08	4506.6
	Reservoir Pump Generator Set	600	33243.17	174918.2	323381.2	870.24	9746.688	9746.688	98911304	2958.816

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	1891.512	7704.85	19693.5	141.5232	756.6048	756.6048	1546683	168.7392
	982 Loader	400	1376.928	5717.376	14245.06	100.8	554.4	554.4	1145693	122.976
	980 Loader	390	1342.505	5574.442	13888.93	98.28	540.54	540.54	1117050	119.9016
	390 Excavator	530	1804.544	6180.563	19421.4	146.6192	707.7196	707.7196	1602376	160.7172
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Skid Steer	65	64.4059	191.8228	368.1093	2.886	34.2472	34.2472	27335.18	5.772
	Telehandler/Aerial Lift	63	52.3404	152.2559	315.5657	2.30454	25.42806	25.42806	22197.76	4.6872
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	1430.75	4987.308	14645.41	106.932	556.0464	556.0464	1215387	128.3184
	Total Non-Haul Engines, Non-Dewater		7962.985	30508.62	82577.97	599.3449	3174.986	3174.986	6676722	711.1116
	Total Haul Engines		4321.968	14874.72	45019.97	331.968	1685.376	1685.376	3628021	389.424
Permitted Emissions	**Recycle Generator Set**	1015	7539.542	28591.37	79727.76	536.2854	2681.427	2681.427	5975891	672.9856
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/day) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	737.5536	3802.157	7187.528	13.608	277.6032	255.8304	1257528	405.5184
	982 Loader	400	532.224	3082.908	5262.506	10.08	195.552	181.44	943342.2	304.416
	980 Loader	390	518.9184	3005.835	5130.943	9.828	190.6632	176.904	919758.7	296.8056
	390 Excavator	530	465.234	3241.92	4563.692	14.098	157.8976	146.6192	1323935	428.5792
	Haul Truck	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
	Haul Truck	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
	Skid Steer	65	8.5618	157.6174	113.7988	0.2405	4.6176	4.2809	22702.11	7.3593
	Telehandler/Aerial Lift	63	4.25754	124.0639	68.10814	0.1953	1.28898	1.21086	18440.78	5.97618
	De-Watering Pump	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
	Water Truck	402	481.194	2861.094	4177.983	10.6932	153.9821	141.1502	1014875	327.2119
	Total Non-Haul Engines, Non-Dewater		2747.943	16275.59	26504.56	58.743	981.6047	907.4356	5500581	1775.867
	Total Haul Engines		1870.512	12354.44	17032.38	31.92	676.704	625.632	3019575	976.752
			0	0	0	0	0	0	0	0
Permitted Emissions	**Recycle Generator Set**	1015	2544.727	11377.66	37939.56	52.577	830.7166	830.7166	5975902	220.8234
	Reservoir Pump Generator Set	600	678.432	3569.76	6599.616	17.76	198.912	198.912	2018598	60.384

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	135.108	550.3464	1406.678	10.1088	54.0432	54.0432	110477.3	12.0528
	982 Loader	400	98.352	408.384	1017.504	7.2	39.6	39.6	81835.2	8.784
	980 Loader	390	95.8932	398.1744	992.0664	7.02	38.61	38.61	79789.32	8.5644
	390 Excavator	530	128.896	441.4688	1387.243	10.4728	50.5514	50.5514	114455.4	11.4798
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Skid Steer	65	32.20295	95.9114	184.0547	1.443	17.1236	17.1236	13667.59	2.886
	Telehandler/Aerial Lift	63	26.1702	76.12794	157.7829	1.15227	12.71403	12.71403	11098.88	2.3436
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	102.1964	356.2363	1046.1	7.638	39.7176	39.7176	86813.36	9.1656
	Total Non-Haul Engines, Non-Dewater		618.8188	2326.649	6191.43	45.03487	252.3598	252.3598	498137.1	55.2762
	Total Haul Engines		308.712	1062.48	3215.712	23.712	120.384	120.384	259144.3	27.816
Permitted Emissions	**Recycle Generator Set**	1015	538.5387	2042.241	5694.84	38.3061	191.5305	191.5305	426849.4	48.0704
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/hr) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	52.6824	271.5826	513.3948	0.972	19.8288	18.2736	89823.45	28.9656
	982 Loader	400	38.016	220.2077	375.8933	0.72	13.968	12.96	67381.59	21.744
	980 Loader	390	37.0656	214.7025	366.4959	0.702	13.6188	12.636	65697.05	21.2004
	390 Excavator	530	33.231	231.5657	325.978	1.007	11.2784	10.4728	94566.77	30.6128
	Haul Truck	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Haul Truck	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Skid Steer	65	4.2809	78.80872	56.89941	0.12025	2.3088	2.14045	11351.06	3.67965
	Telehandler/Aerial Lift	63	2.12877	62.03197	34.05407	0.09765	0.64449	0.60543	9220.39	2.98809
	De-Watering Pump	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
	Water Truck	402	34.371	204.3639	298.4274	0.7638	10.99872	10.08216	72491.04	23.37228
	Total Non-Haul Engines, Non-Dewater		201.7757	1283.263	1971.143	4.3827	72.64601	67.17044	410531.3	132.5628
	Total Haul Engines		133.608	882.4603	1216.599	2.28	48.336	44.688	215683.9	69.768
Permitted Emissions	**Recycle Generator Set**	1015	181.7662	812.6902	2709.969	3.7555	59.3369	59.3369	426850.1	15.7731
	Reservoir Pump Generator Set	600	84.804	446.22	824.952	2.22	24.864	24.864	252324.8	7.548

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	319.436	1301.185	3325.811	23.90025	127.7744	127.7744	261201.7	28.49645
	982 Loader	400	232.5337	965.5428	2405.686	17.02297	93.62633	93.62633	193483.1	20.76802
	980 Loader	390	226.7204	941.4042	2345.544	16.59739	91.28567	91.28567	188646	20.24882
	390 Excavator	530	293.7127	1005.966	3161.083	23.86416	115.1904	115.1904	260807.2	26.15879
	Haul Truck	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Haul Truck	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Skid Steer	65	44.42281	132.3063	253.8967	1.990566	23.62139	23.62139	18853.95	3.981133
	Telehandler/Aerial Lift	63	36.10085	105.0157	217.6558	1.589515	17.53855	17.53855	15310.5	3.232912
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	563.9052	1965.661	5772.231	42.14538	219.156	219.156	479023.5	50.57446
	Total Non-Haul Engines, Non-Dewater		1716.832	6417.08	17481.91	127.1102	688.1928	688.1928	1417326	153.4606
	Total Haul Engines		1438.567	4951.051	14984.9	110.4955	560.9774	560.9774	1207587	129.6198
Permitted Emissions	**Recycle Generator Set**	1015	339.2213	1286.392	3587.135	24.12871	120.6436	120.6436	268869.1	30.27917
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	124.5571	642.1031	1213.82	2.298101	46.88126	43.20429	212369.7	68.4834
	982 Loader	400	89.88127	520.6373	888.7249	1.702297	33.02456	30.64134	159310.4	51.40936
	980 Loader	390	87.63424	507.6213	866.5068	1.659739	32.19894	29.87531	155327.6	50.12413
	390 Excavator	530	75.72281	527.664	742.7994	2.29463	25.69986	23.86416	215487.4	69.75677
	Haul Truck	600	311.3	2056.088	2834.615	5.312286	112.6205	104.1208	502532.7	162.556
	Haul Truck	600	311.3	2056.088	2834.615	5.312286	112.6205	104.1208	502532.7	162.556
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	5.905347	108.7138	78.49069	0.165881	3.184906	2.952673	15658.37	5.075944
	Telehandler/Aerial Lift	63	2.936561	85.57086	46.97636	0.134705	0.889051	0.835169	12719.2	4.121962
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
	Water Truck	402	189.6542	1127.65	1646.679	4.214538	60.68935	55.6319	399995.1	128.9649
	Total Non-Haul Engines, Non-Dewater		576.2915	3519.961	5483.997	12.46989	202.5679	187.0048	1170868	377.9364
	Total Haul Engines		622.5999	4112.177	5669.229	10.62457	225.2409	208.2416	1005065	325.1119
Permitted Emissions	**Recycle Generator Set**	1015	114.4931	511.9072	1706.988	2.36556	37.37585	37.37585	268869.6	9.935352
	Reservoir Pump Generator Set	600	73.28864	385.6287	712.9335	1.918551	21.48777	21.48777	218062.1	6.523073

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	4.17007	16.98629	43.41673	0.312005	1.668028	1.668028	3409.851	0.372006
	982 Loader	400	3.035607	12.60466	31.40497	0.222226	1.222243	1.222243	2525.82	0.271116
	980 Loader	390	2.959716	12.28954	30.61985	0.21667	1.191687	1.191687	2462.675	0.264338
	390 Excavator	530	3.978339	13.62581	42.81687	0.32324	1.560255	1.560255	3532.634	0.354321
	Haul Truck	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Haul Truck	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Skid Steer	65	0.141991	0.422897	0.811542	0.006363	0.075502	0.075502	60.26376	0.012725
	Telehandler/Aerial Lift	63	0.115391	0.335667	0.695703	0.005081	0.056059	0.056059	48.93768	0.010334
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	3.154264	10.99513	32.28759	0.235745	1.225872	1.225872	2679.47	0.282894
	Total Non-Haul Engines, Non-Dewater		17.55538	67.25999	182.0533	1.321329	6.999646	6.999646	14719.65	1.567733
	Total Haul Engines		9.528308	32.79314	99.25204	0.731864	3.715618	3.715618	7998.417	0.858533
Permitted Emissions	**Recycle Generator Set**	1015	16.62184	63.03319	175.7696	1.182307	5.911535	5.911535	13174.59	1.483679
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	1.626027	8.382321	15.84579	0.030001	0.61201	0.564009	2772.375	0.894015
	982 Loader	400	1.173353	6.796648	11.60184	0.022223	0.431118	0.400007	2079.714	0.671122
	980 Loader	390	1.144019	6.626731	11.31179	0.021667	0.42034	0.390007	2027.721	0.654344
	390 Excavator	530	1.025665	7.147209	10.06122	0.031081	0.348105	0.32324	2918.776	0.944855
	Haul Truck	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
	Haul Truck	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
	Skid Steer	65	0.018876	0.347487	0.250883	0.00053	0.01018	0.009438	50.04959	0.016224
	Telehandler/Aerial Lift	63	0.009386	0.273514	0.150153	0.000431	0.002842	0.002669	40.65496	0.013175
	De-Watering Pump	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
	Water Truck	402	1.060851	6.307633	9.210876	0.023574	0.339472	0.311183	2237.415	0.721379
	Total Non-Haul Engines, Non-Dewater		6.058178	35.88154	58.43255	0.129506	2.164068	2.000553	12126.71	3.915116
	Total Haul Engines		4.123773	27.23689	37.54998	0.070372	1.491877	1.379282	6657.022	2.15337
Permitted Emissions	**Recycle Generator Set**	1015	5.610162	25.08345	83.64242	0.115912	1.831417	1.831417	13174.61	0.486832
	Reservoir Pump Generator Set	600	1.495687	7.869974	14.54966	0.039154	0.438526	0.438526	4450.247	0.133124

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.297862	1.213306	3.101195	0.022286	0.119145	0.119145	243.5608	0.026572
	982 Loader	400	0.216829	0.900333	2.243212	0.015873	0.087303	0.087303	180.4157	0.019365
	980 Loader	390	0.211408	0.877824	2.187132	0.015476	0.08512	0.08512	175.9053	0.018881
	390 Excavator	530	0.284167	0.973272	3.058348	0.023089	0.111447	0.111447	252.331	0.025309
	Haul Truck	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Haul Truck	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Skid Steer	65	0.070995	0.211448	0.405771	0.003181	0.037751	0.037751	30.13188	0.006363
	Telehandler/Aerial Lift	63	0.057695	0.167833	0.347852	0.00254	0.02803	0.02803	24.46884	0.005167
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	0.225305	0.785367	2.306257	0.016839	0.087562	0.087562	191.3907	0.020207
	Total Non-Haul Engines, Non-Dewater		1.364262	5.129384	13.64977	0.099285	0.556358	0.556358	1098.204	0.121863
	Total Haul Engines		0.680593	2.342367	7.089431	0.052276	0.265401	0.265401	571.3155	0.061324
Permitted Emissions	**Recycle Generator Set**	1015	1.187275	4.50237	12.55497	0.08445	0.422252	0.422252	941.0418	0.105977
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.116145	0.598737	1.131842	0.002143	0.043715	0.040286	198.0268	0.063858
	982 Loader	400	0.083811	0.485475	0.828703	0.001587	0.030794	0.028572	148.551	0.047937
	980 Loader	390	0.081716	0.473338	0.807985	0.001548	0.030024	0.027858	144.8372	0.046739
	390 Excavator	530	0.073262	0.510515	0.718658	0.00222	0.024865	0.023089	208.484	0.06749
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Skid Steer	65	0.009438	0.173743	0.125442	0.000265	0.00509	0.004719	25.0248	0.008112
	Telehandler/Aerial Lift	63	0.004693	0.136757	0.075076	0.000215	0.001421	0.001335	20.32748	0.006588
	De-Watering Pump	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
	Water Truck	402	0.075775	0.450545	0.65792	0.001684	0.024248	0.022227	159.8154	0.051527
	Total Non-Haul Engines, Non-Dewater		0.444839	2.829111	4.345626	0.009662	0.160157	0.148085	905.0667	0.292251
	Total Haul Engines		0.294555	1.945492	2.682141	0.005027	0.106563	0.09852	475.5016	0.153812
Permitted Emissions	**Recycle Generator Set**	1015	0.400726	1.791675	5.974459	0.008279	0.130815	0.130815	941.0435	0.034774
	Reservoir Pump Generator Set	600	0.186961	0.983747	1.818708	0.004894	0.054816	0.054816	556.2809	0.01664

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Pre-mitigation)

Aggregates Fugitive Mining, Storage, and Sitewide Drop Emissions

Drops from stationary equipment (i.e., conveyors) are included in the plant emissions calculations.

Drop, Mining, and Storage Pile Emissions Factors

Material Drop Emission Factor from AP42 13.2.4:	
PM10 E.F. (lb/ton) = $k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	
k = particle size multiplier =	0.35
U = mean wind speed[1] =	4.9
M = material moisture content =	3
PM10 EF (lb/ton) =	0.00062
PM2.5 EF[2] (lb/ton) =	0.00018

Bulldozing Emission Factor, CalEEMod User Manual, Appendix A:		
EF PM10 (lb/hr) = 1.0 * s^1.5 / 7.9 * 0.75 =	0.67	
EF PM2.5 (lb/hr) = 5.7 * s^1.2 / 7.9 * 0.105 =	0.09	
s (silt, %) =	6.9	
Watering C.E. =	61%	water every 3 hours if material is not already wet
days of rain =	51	

Quarry Operation Fugitive Emissions:	
lbs PM10 / Ton Quarried[3] =	0.021
lbs PM2.5/lbs PM10 =	0.292

Storage Pile Emissions Controlled Factor from SSP1610 - Aggregate Processing:

lb PM10/acre/day 1.054

	Area (acres)	lbs PM10/hr	lbs PM10/day	lbs PM10/yr
Baseline Storage	2	0.1	2.1	769.4
Project Storage	2	0.1	2.1	769.4

Notes:

[1] Mean wind speed based on data for Tulare in Table 1 of CalEEMod User Manual Appendix D which states 2.2 m/s (equvalent to 4.921 mph).

[2] PM2.5 emission factor assumed to be 29.2% of PM10 for material drops based on SCAQMD's *Updated CEIDARS Table with PM2.5 Fractions for mineral products - loading*

[3] Emission Factor from San Diego Air Pollution Control District, *Quarry Operations, General* (https://bit.ly/2XXNWUI)

Drop and Mining Emissions - Baseline

	Throughput			**PM10 Emissions**			**PM2.5 Emissions**		
Activity	**Peak Hour (tph)**	**Peak Day (tpd)**	**Avg Annual (tpy)**	**Peak Hour (lb/hr)**	**Peak Day (lb/day)**	**Avg Annual (lb/yr)**	**Peak Hour (lb/hr)**	**Peak Day (lb/day)**	**Avg Annual (lb/yr)**
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	650	4,000	500,000	0.4	2	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Plant	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Export Trucks	650	4,000	500,000	0.4	2	311	0.1	1	91

Drop and Mining Emissions - Project

	Throughput			**PM10 Emissions**			**PM2.5 Emissions**		
Activity	**Peak Hour (tph)**	**Peak Day (tpd)**	**Avg Annual (tpy)**	**Peak Hour (lb/hr)**	**Peak Day (lb/day)**	**Avg Annual (lb/yr)**	**Peak Hour (lb/hr)**	**Peak Day (lb/day)**	**Avg Annual (lb/yr)**
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	700	7,000	500,000	0.4	4	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	700	7,000	500,000	0.4	4	311	0.1	1	91
Loader to Plant	700	7,000	500,000	0.4	4	311	0.1	1	91
Loader to Export Trucks	700	7,000	500,000	0.4	4	311	0.1	1	91

Average Emissions (Pre-mitigation)

Recycle Plant - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.002367
Basline Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	0.8284
Total PM2.5 Emissions, lb/hr	0.24

	Max (ton/hr)
Processing	350

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	350	9	*Truck Unloading Stone*	0.000016	0.0056
3	Hopper	Conveyor 1	0	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
4	Conveyor 1	Jaw Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
5	Jaw Crusher	Conveyor 2	215	350	2	*Primary Crushing*	0.000540	0.1890
6	Conveyor 2	Screen 1	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
7	Screen 1	Conveyor 3, 4, 5	60	350	1	*Screening*	0.000740	0.2590
8	Conveyor 3	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
9	Conveyor 4	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
10	Conveyor 5	Conveyor 6	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
11	Conveyor 6	Cone Crusher	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
12	Cone Crusher	Conveyor 7, 8	200	245	3	*Secondary Crushing*	0.000540	0.1323
13	Conveyor 7	Conveyor 9	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
14	Conveyor 8	Screen 2	200	184	7	*Conv. Transfer Pt.*	0.000046	0.0085
15	Conveyor 9	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
16	Screen 2	Conveyor 10, 11, 12	60	184	1	*Screening*	0.000740	0.1360
17	Conveyor 10	Conveyor 13	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
18	Conveyor 11	Conveyor 14	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
19	Conveyor 12	Conveyor 15	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
20	Conveyor 13	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
21	Conveyor 14	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
22	Conveyor 15	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Description	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drilling	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Average Emissions (Pre-mitigation)

Recycle Plant - Project

Project Factor PM10 Emissions (lbs/ton)	0.002367
Project Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	0.8284
Total PM2.5 Emissions, lb/hr	0.24

	Max (ton/hr)
Processing	350

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	350	9	*Truck Unloading Stone*	0.000016	0.0056
3	Hopper	Conveyor 1	0	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
4	Conveyor 1	Jaw Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
5	Jaw Crusher	Conveyor 2	215	350	2	*Primary Crushing*	0.000540	0.1890
6	Conveyor 2	Screen 1	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
7	Screen 1	Conveyor 3, 4, 5	60	350	1	*Screening*	0.000740	0.2590
8	Conveyor 3	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
9	Conveyor 4	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
10	Conveyor 5	Conveyor 6	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
11	Conveyor 6	Cone Crusher	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
12	Cone Crusher	Conveyor 7, 8	200	245	3	*Secondary Crushing*	0.000540	0.1323
13	Conveyor 7	Conveyor 9	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
14	Conveyor 8	Screen 2	200	184	7	*Conv. Transfer Pt.*	0.000046	0.0085
15	Conveyor 9	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
16	Screen 2	Conveyor 10, 11, 12	60	184	1	*Screening*	0.000740	0.1360
17	Conveyor 10	Conveyor 13	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
18	Conveyor 11	Conveyor 14	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
19	Conveyor 12	Conveyor 15	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
20	Conveyor 13	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
21	Conveyor 14	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
22	Conveyor 15	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Average Emissions (Pre-mitigation)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000108
Basline Factor PM2.5 Emissions (lbs/ton)	0.000031536
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	650

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Descriptio	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drillin	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Average Emissions (Pre-mitigation)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000100286
Basline Factor PM2.5 Emissions (lbs/ton)	2.92834E-05
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	700

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Average Emissions (Pre-mitigation)

Truck Loading and Maneuvering	Baseline	Project		
Excavator Production Rate	691	691	tons/hour	4.3 cy bucket cycle time analysis
Truck payload	50	50	tons	
Time to load a truck	4.3	4.3	minutes	Calculation
Time to maneuver	0.8	0.8	minutes	Caterpillar Handbook (44 ed.)
Total time load and maneuver	5.1	5.1	minutes	Calculation
Haul Road Length	0.3	0.6	miles	Assumes avg. trip to be half of site length/longest path
Truck Haul Avg Speed	30.0	30.0	mph	
Haul Time	0.6	1.2	minutes	
Total Time Per Load	5.7	6.3	minutes	
Material transported by Truck	100%	100%	Percent of total material	
VMT/Ton Transferred	0.012	0.024		
Operating Hour/Ton Transferred	0.0038	0.0042		
Vehicle HP	600	600		
HP-HR/Ton Transferred	2.30	2.54		
lb PM10 Ems/Ton Transferred	0.025	0.049	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM2.5 Ems/Ton Transferred	0.005	0.010	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM10 Ems/Ton Processed	0.025	0.049	Takes into account percent of total material transported by truck	
lb PM2.5 Ems/Ton Processed	0.005	0.010	Takes into account percent of total material transported by truck	
Annual Rainfall Reduction Factor	0.860273973	0.860274		

Average Emissions (Pre-mitigation)

Basline Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
Control efficiency for unpaved roads in baseline is 80% for watering.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Basline Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2
Control efficiency for unpaved roads in baseline is 80% for watering.

Future Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Future Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2

Average Emissions (Pre-mitigation)

Source: EMFAC2021 (v1.0.0) Emission Rates
Region Type: Sub-Area
Region: Tuolumne (MC)
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, g/mile for RUNEX, PMBW and PMTW, mph for Speed

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Total VMT	CVMT	EVMT	NOx_RUNEX
Tuolumne (MC)	2021	T7 Tractor Class 8	2021	15	Diesel	0.051113349	0.051113349	0	2.951511768

PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	SOx_RUNEX	NH3_RUNEX	PM10_PMBW	PM2.5_PMBW
0.003375524	0.00352815	1891.421977	0.000909605	0.297994303	0.019583553	0.022294384	0.2189903	0.017910635	0.22	0.135264231	0.047342481

Emissions (lbs)

	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	25	20000	32000	1.38158	15.44931	208.22303	1.26356	0.24890	0.23814	133435.89368	0.06417	98.66144	20.91623
On-Road Truck Emissions Daily	1.6	25	280	448	0.01934	0.21629	2.91512	0.01769	0.00348	0.00333	1868.10251	0.00090	1.38126	0.29283
On-Road Truck Emissions Hourly	1.6	25	28	44.8	0.00193	0.02163	0.29151	0.00177	0.00035	0.00033	186.81025	0.00009	0.13813	0.02928

Off-Road Emissions Emissions Calculations - Cycle Time Analyses

Assumptions

Parameters	Truck Loading
Loader Model	980H Loader
Travel Distance (avg) (meters)	15
Bucket Payload[1] (yd^3)	7.00
Bucket Payload in Tons	10.5
Material Type[2]	Uniform Agg > 1"
Bucket Fill Factor[2]	85%
Job Efficiency[3] (work 50 min/hr)	83%
Grade Resistance[4]	0%
Rolling Resistance[4]	3%
Total Resistance[4]	3%

Cycle Time (mins)

Hydraulic Cycle Time [5]	Truck Loading	
Average Cycle Time [6]		0.65
Material Handler?	Yes	-0.05
Materials:	3/4" to 6"	0.00
Pile:	Conveyor piled >10'	0.00
Truck Ownership:	Common	-0.04
Operation Cycle:	Constant	-0.04
Target Type:	N/A	0.00
Total Hydraulic Cycle Time		**0.52**

Total Cycle Time (mins)	Truck Loading
Hydraulic Cycle Time (min/cycle)	0.52
Travel with load[7] (min/cycle)	0.08
Travel empty[7] (min/cycle)	0.07
Total Cycle Time (min/cycle)	**0.67**

Rate Calculations

Production Calculations	Truck Loading
Cycles per Hour	74.6
Production Rate (tph)	666

[1] Bucket payload ranges based on activity type and equipment size. In this case, heaped bucket capacity for the 980H is equal to the bucket capacity of a 988 that is equipped for digging. Thus, all three loaders (980, 982, 988) have similar e

[2] Material type and bucket fill factor from Caterpillar Performance Handbook Edition 41, January 2011

[3] Job efficiency accounts for operator skill, minor repairs and adjustments, personnel delays, and delays caused by job l CPH suggested 50 minutes (83%) (CPH page 12-80)

[4] Resisitance from CPH pg 22-5 and 22-6 and "Typical Rolling Resistance Factors" table on page 27-1

[5] Guidelines for "Selecting a Machine" on page 12-79 and 12-80 of CPH were used to determine the hydraulic cycle time

[6] Average cycle time for this type of equipment is tabulated on page 12-80 of CPH.

[7] Figures on pages 12-149 through 12-156 in the CPH were used to estimate the travel times for theloaders.

Excavator Cycle Time Analysis

Assumptions

Excavator Bucket Size =	4.3	yd^3
Material Type =	Sand and Gravel	
Sand and Gravel density =	1.5	$tons/yd^3$

Cycle Time

From the Caterpillar Performance Handbook, Edition 41 (2011)
page 4-183 "Cycle Time Estimating Chart"
Based on the low end of the typical range due to the loose configuration of material to be moved.

Cycle Time =	0.28	minutes

Production Estimate

Production Rate =	691	yd^3/hour
Production Rate =	1037	tons/hour
Job Efficiency* =	67%	
Production Rate =	691	tons/hour

* Job efficiency is estimated to be 40 minutes per hour to account for operator skill, minor delays, and periodic excavator transportation

Average Emissions (Pre-mitigation)

Road Based Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	2.10E-05
7440393	Barium	1.45E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	2.50E-05
18540299	Hexavalent Chromium	1.25E-06
7440508	Copper	4.00E-05
7439921	Lead	3.00E-05
7439965	Manganese	4.90E-04
7440020	Nickel	1.90E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	1.12E-04

From SDACPD "H03 - Haul Roads, Mineral Industry Sites..."
https://bit.ly/39VKJKC
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Quarrying Fugitive Emissions		
7440382	Arsenic	2.0E-05
7440417	Beryllium	0.000001
7440439	Cadmium	0.000001
7440473	Chromium	5.00E-05
18540299	Haxavalent Chromium	2.50E-06
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	2.00E-04

From SDACPD " Q01 - Quarry Operations, General..."
https://bit.ly/3oeslls

Aggregates Processing Fugative Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	1.00E-06
7440393	Barium	2.25E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
18540299	Hexavalent Chromium	1.40E-06
7440473	Chromium	2.80E-05
7440484	Cobalt	1.10E-05
7440508	Copper	3.70E-05
7439921	Lead	5.00E-05
7439965	Manganese	5.30E-04
7440020	Nickel	2.80E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	9.90E-05

From SDACPD "T01 - Transfer Point, Process Material..."
(same speciation as S01 for Screening and C01 for Crushing)
https://bit.ly/2Y9f5E7
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Storage Fugitive Emissions - SJAPCD Prof. ID 207		
7440382	Arsenic	2.00E-05
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	5.00E-05
18540299	Hexavalent Chromium	2.50E-07
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
7440666	Zinc	2.00E-04

From SJVAPCD Document, "AB2588 'Hots Spots' Air Toxics Profiles"
March 27, 2017

	Baseline Tonnage		Project Tonnage		Recycle Plant Tonnage - Baseline and Excavation
	Gross	Net	Gross	Net	
Annual	714,286	500,000	714,286	500,000	100,000
Daily	6,000	4,000	6,000	7,000	2,600
Houlry	1,000	650	1,000	700	350

Average Emissions (Mitigated)

		Baseline (lbs/year) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									236.68	69.11	236.68	69.11	0
	Recycle Engine	339.22	1,286.39	3,587.14	24.13	120.64	121	268,869.08	30.28			120.64	120.64	269,716.90
	Aggregates Plant Fugitive Ems.									54	16	54.00	15.77	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000	4,380	0
	Excavation Offroad Engines	1,717	6,417	17,482	127	688	688	1,417,326	153			688	688	1,421,623
	Aggregates Transfer/Drops									1,244	363	1,244	363	0
	Off-Road Vehicle Haul	1,439	4,951	14,985	110	561	561	1,207,587	130	10,631	2,254	11,192	2,815	1,211,216
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**3,495**	**12,655**	**36,054**	**262**	**1,370**	**1,370**	**2,893,782**	**313**	**27,935**	**7,306**	**29,304**	**8,676**	**2,902,556**

		Baseline (lbs/day) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6.15	1.80	6.15	1.80	0.00
	Recycle Engine	16.62	63.03	175.77	1.18	5.91	6	13,174.59	1.48			5.91	5.91	13,216.13
	Aggregates Plant Fugitive Ems.									0.43	0.13	0.43	0.13	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Excavation Offroad Engines	17.6	67.3	182.1	1.3	7.0	7.0	14,719.7	1.6			7.00	7.00	14,764
	Aggregates Transfer/Drops									10	3	9.95	2.91	0
	Off-Road Vehicle Haul Emissions	10	33	99	1	4	4	7,998	1	99	21	102.57	24.67	8,022
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**44**	**163**	**457**	**3**	**17**	**17**	**35,893**	**4**	**244**	**63**	**260**	**80**	**36,002**

		Baseline (lbs/hr) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									0.83	0.24	0.83	0.24	0.00
	Recycle Engine	1.19	4.50	12.55	0.08	0.42	0.42	941.04	0.11			0.42	0.42	944.01
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Excavation Offroad Engines	1.4	5.1	13.6	0.1	0.6	0.6	1,098.2	0.1			0.56	0.56	1,102
	Aggregates Transfer/Drops									2	0	1.62	0.47	0
	Off-Road Vehicle Haul Emissions	1	2	7	0.1	0.3	0.3	571	0.06	16	3	16.33	3.67	573
	De-watering Pumps													
	On-Road Vehicle Haul													
	Slurry Wall Construction, Grading													
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**3**	**12**	**33**	**0**	**1**	**1**	**2,611**	**0**	**40**	**10**	**41**	**12**	**2,619**

*CO2e Calculated based on IPCC Fifth Assessment Report (AR5)
Assumes GWP factor of: 28 for Methane

Average Emissions (Mitigated)

		Years 1 - 20 (lbs/year) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									237	69	236.68	69.11	0.00
	Recycle Engine	114	512	1,707	2	37	37	268,870	10			37.38	37.38	269,147.75
	Aggregates Plant Fugitive Ems.									50	15	50.14	14.64	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000.00	4,380.00	0
	Excavation Offroad Engines	576	3,520	5,484	12	203	187	1,170,868	378			202.57	187.00	1,181,450
	Aggregates Transfer/Drops									1,244	363	1,243.74	363.17	0
	Off-Road Vehicle Haul	623	4,112	5,669	11	225	208	1,005,065	325.11	10,631	2,254	10,856	2,462	1,014,169
	De-watering Pumps	277	1,542	1,517	3	76	76	208,844	24.99			75.70	75.70	209,543
	On-Road Vehicle Haul	1	15	208	1	0.25	0.2	133,436	0.06	42.44	9.00	42.69	9.23	133437.69
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**1,592**	**9,702**	**14,585**	**29**	**541**	**509**	**2,787,082**	**738**	**27,973**	**7,314**	**28,514**	**7,823**	**2,807,747**

		Years 1 - 20 (lbs/day) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6	2	6.15	1.80	0.00
	Recycle Engine	5.6	25.1	83.6	0.1	1.8	1.8	13,174.6	0.5			1.83	1.83	13,188.24
	Aggregates Plant Fugitive Ems.									1	0	0.70	0.20	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Excavation Offroad Engines	6.1	35.9	58.4	0.1	2.2	2.0	12,126.7	3.9			2.16	2.00	12,236
	Aggregates Transfer/Drops									17	5	17.41	5.08	0
	Off-Road Vehicle Haul Emissions	4	27	38	0.1	1	1	6,657	2.15	173.00	36.68	174.49	38.06	6,717
	De-watering Pumps	1.8	9.9	9.7	0.02	0.5	0.5	1,335	0.16			0.48	0.48	1,340
	On-Road Vehicle Haul	0.02	0.2	2.9	0.02	0.0	0.003	1,868	0.001	0.69	0.15	0.69	0.15	1868.12767
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**18**	**98**	**192**	**0**	**6**	**6**	**35,162**	**7**	**326**	**81**	**332**	**87**	**35,350**

		Years 1 - 20 (lbs/hr) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1	0.2	0.83	0.24	0.00
	Recycle Engine	0.40	1.79	5.97	0.01	0.13	0.13	941.04	0.03			0.13	0.13	942.02
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Excavation Offroad Engines	0.4	2.8	4.3	0.0	0.2	0.1	905.1	0.3			0.16	0.15	913
	Aggregates Transfer/Drops									1.7	0.5	1.74	0.51	0
	Off-Road Vehicle Haul Emissions	0	2	3	0	0	0	476	0.15	17.30	3.67	17.41	3.77	480
	De-watering Pumps	0.07	0.41	0.40	0.001	0.02	0.02	55.63	0.01			0.02	0.02	56
	On-Road Vehicle Haul	0.00	0.02	0.29	0.002	0.00035	0.00	186.81	0.00	0.07	0.01	0.07	0.01	186.812767
	Slurry Wall Construction, Grading											0.00	0.00	0
	Visitors, Employees, Diesel Delivery Onsite											0.00	0.00	0
	Total Emissions	**1**	**7**	**14**	**0**	**0**	**0**	**2,564**	**0**	**41**	**11**	**42**	**11**	**2,578**

Average Emissions (Mitigated)

	Equipment	Approximate HP	Opp-Hour/Ton Processed	Load Factor	Hp-Hr/Ton Processed	Max Daily Opp-Hr
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.001501	0.36	0.29	14
	982 Loader	400	0.001501	0.36	0.22	14
	980 Loader	390	0.001501	0.36	0.21	14
	390 Excavator	530	0.001447	0.38	0.29	14
	Haul Truck	600	0.004227	0.38	0.96	14
	Haul Truck	600	0.004227	0.38	0.96	14
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	N/A*	0.37	N/A	2
	Telehandler/Aerial Lift	63	N/A*	0.31	N/A	2
	De-Watering Pump	30	N/A*	0.74	N/A	24
	De-Watering Pump	30	N/A*	0.74	N/A	24
	Water Truck	402	N/A*	0.38	N/A	14
	Total Non-Haul Engines, Non-Dewater					
	Total Haul Engines					
Permitted Emissions	**Recycle Generator Set**	1015	0.002857143	0.74	2.15	14
	Reservoir Pump Generator Set	600		0.74		8

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truck HP, which is based on Cat 772 or equivalent truck v

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is conservatively estimated based on the 2005 emission year (App D Table 3.4)

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conservatively estimated based on 2021 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based on cycle time calculations and tonnage throughput

Average Emissions (Mitigated)

	Equipment	Approximate HP	Project		Baseline		Annual Operating Hours	Avg Daily Operating Hours
			Avg Annual Hp-Hr	Max Daily Hp-Hr	Avg Annual Hp-Hr	Max Daily Hp-Hr		
	988 Loader	540	208480	2721.6	208480	2721.6	386	1.23
	982 Loader	400	154430	2016	154430	2016	386	1.23
	980 Loader	390	150569	1965.6	150569	1965.6	386	1.23
Emissions Based On	**390 Excavator**	530	208165	2819.6	208165	2819.6	393	1.26
Cycle Time	**Haul Truck**	600	481922	3192	481922	3192	803	2.57
Analysis/Throughput	**Haul Truck**	600	481922	3192	481922	3192	803	2.57
	Skid Steer	65	15048	48.1	15048	48.1	626	2
	Telehandler/Aerial Lift	63	12220	39.06	12220	39.06	626	2
	De-Watering Pump	30	83345	532.8	0	0	3754	12
Emissions Based On	**De-Watering Pump**	30	83345	532.8	0	0	3754	12
Fixed Operational Hours	**Water Truck**	402	382336	2138.64	382336	2138.64	2503	8
	Total Non-Haul Engines, Non-Dewater							
	Total Haul Engines							
	Recycle Generator Set	1015	214600	10515.4	214600	10515.4	211	0.68
Permitted Emissions	**Reservoir Pump Generator Set**	600	174048	3552			392	

HP estimated based on CalEEMod App D for equipment that does not hwith 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions Factor (g/hp-hr) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.695	2.831	7.236	0.052	0.278	0.278	568.299	0.062
	982 Loader	400	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
	980 Loader	390	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
Emissions Based On	**390 Excavator**	530	0.64	2.192	6.888	0.052	0.251	0.251	568.299	0.057
Cycle Time	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
Analysis/Throughput	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
	Skid Steer	65	1.339	3.988	7.653	0.06	0.712	0.712	568.299	0.12
	Telehandler/Aerial Lift	63	1.34	3.898	8.079	0.059	0.651	0.651	568.299	0.12
	De-Watering Pump	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Emissions Based On	**De-Watering Pump**	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Fixed Operational Hours	**Water Truck**	402	0.669	2.332	6.848	0.05	0.26	0.26	568.299	0.06
	Total Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
	Recycle Generator Set	1015	0.717	2.719	7.582	0.051	0.255	0.255	568.299	0.064
Permitted Emissions	**Reservoir Pump Generator Set**	600								

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions Factor (g/hp-hr) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.271	1.39703	2.64092	0.005	0.102	0.094	462.0548	0.149
	982 Loader	400	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
	980 Loader	390	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
Emissions Based On	**390 Excavator**	530	0.165	1.14978	1.61856	0.005	0.056	0.052	469.547	0.152
Cycle Time	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
Analysis/Throughput	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
	Skid Steer	65	0.178	3.27687	2.36588	0.005	0.096	0.089	471.9774	0.153
	Telehandler/Aerial Lift	63	0.109	3.17624	1.74368	0.005	0.033	0.031	472.1142	0.153
	De-Watering Pump	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Emissions Based On	**De-Watering Pump**	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Fixed Operational Hours	**Water Truck**	402	0.225	1.33781	1.95357	0.005	0.072	0.066	474.542	0.153
	Total Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.242	1.082	3.608	0.005	0.079	0.079	568.3	0.021
	Reservoir Pump Generator Set	600	0.191	1.005	1.858	0.005	0.056	0.056	568.299	0.017

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	144893.7	590207.4	1508563	10840.97	57957.49	57957.49	1.18E+08	12925.77
	982 Loader	400	105475.5	437962.8	1091201	7721.489	42468.19	42468.19	87762439	9420.216
	980 Loader	390	102838.6	427013.8	1063921	7528.451	41406.48	41406.48	85568378	9184.711
	390 Excavator	530	133225.8	456298.5	1433843	10824.6	52249.51	52249.51	1.18E+08	11865.43
	Haul Truck	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Haul Truck	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Skid Steer	65	20149.85	60013.13	115165.6	902.9057	10714.48	10714.48	8552007	1805.811
	Telehandler/Aerial Lift	63	16375.07	47634.34	98727	720.9918	7955.35	7955.35	6944727	1466.424
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	255783.1	891608.6	2618240	19116.82	99407.48	99407.48	2.17E+08	22940.19
	Total Non-Haul Engines, Non-Dewater		778741.8	2910739	7929660	57656.23	312159	312159	6.43E+08	69608.55
	Total Haul Engines		652523	2245759	6797035	50119.94	254455.1	254455.1	5.48E+08	58794.54
Permitted Emissions	**Recycle Generator Set**	1015	153868.2	583497.4	1627097	10944.6	54723	54723	1.22E+08	13734.4
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	56498.13	291253.1	550579.5	1042.401	21264.98	19597.14	96329273	31063.55
	982 Loader	400	40769.46	236157.1	403118.8	772.1489	14979.69	13898.68	72261968	23318.9
	980 Loader	390	39750.22	230253.2	393040.9	752.8451	14605.2	13551.21	70455419	22735.92
	390 Excavator	530	34347.29	239344.4	336928.1	1040.827	11657.26	10824.6	97743427	31641.14
	Haul Truck	600	141203.3	932626	1285760	2409.612	51083.78	47228.4	2.28E+08	73734.14
	Haul Truck	600	141203.3	932626	1285760	2409.612	51083.78	47228.4	2.28E+08	73734.14
	Skid Steer	65	2678.62	49311.74	35602.78	75.24214	1444.649	1339.31	7102518	2302.41
	Telehandler/Aerial Lift	63	1332.002	38814.29	21308.12	61.101	403.2666	378.8262	5769330	1869.691
	De-Watering Pump	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
	Water Truck	402	86025.7	511493.5	746921	1911.682	27528.22	25234.21	1.81E+08	58497.48
	Total Non-Haul Engines, Non-Dewater		261401.4	1596627	2487499	5656.247	91883.26	84823.97	5.31E+08	171429.1
	Total Haul Engines		282406.6	1865252	2571519	4819.225	102167.6	94456.81	4.56E+08	147468.3
			0	0	0	0	0	0	0	0
Permitted Emissions	**Recycle Generator Set**	1015	51933.2	232197.2	774276.8	1073	16953.4	16953.4	1.22E+08	4506.6
	Reservoir Pump Generator Set	600	33243.17	174918.2	323381.2	870.24	9746.688	9746.688	98911304	2958.816

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Load Factor Based on CalEEMod App D Table 3.3

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	1891.512	7704.85	19693.5	141.5232	756.6048	756.6048	1546683	168.7392
	982 Loader	400	1376.928	5717.376	14245.06	100.8	554.4	554.4	1145693	122.976
	980 Loader	390	1342.505	5574.442	13888.93	98.28	540.54	540.54	1117050	119.9016
	390 Excavator	530	1804.544	6180.563	19421.4	146.6192	707.7196	707.7196	1602376	160.7172
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Skid Steer	65	64.4059	191.8228	368.1093	2.886	34.2472	34.2472	27335.18	5.772
	Telehandler/Aerial Lift	63	52.3404	152.2559	315.5657	2.30454	25.42806	25.42806	22197.76	4.6872
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	1430.75	4987.308	14645.41	106.932	556.0464	556.0464	1215387	128.3184
	Total Non-Haul Engines, Non-Dewater		7962.985	30508.62	82577.97	599.3449	3174.986	3174.986	6676722	711.1116
	Total Haul Engines		4321.968	14874.72	45019.97	331.968	1685.376	1685.376	3628021	389.424
Permitted Emissions	**Recycle Generator Set**	1015	7539.542	28591.37	79727.76	536.2854	2681.427	2681.427	5975891	672.9856
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/day) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	737.5536	3802.157	7187.528	13.608	277.6032	255.8304	1257528	405.5184
	982 Loader	400	532.224	3082.908	5262.506	10.08	195.552	181.44	943342.2	304.416
	980 Loader	390	518.9184	3005.835	5130.943	9.828	190.6632	176.904	919758.7	296.8056
Emissions Based On	**390 Excavator**	530	465.234	3241.92	4563.692	14.098	157.8976	146.6192	1323935	428.5792
Cycle Time	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
Analysis/Throughput	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
	Skid Steer	65	8.5618	157.6174	113.7988	0.2405	4.6176	4.2809	22702.11	7.3593
	Telehandler/Aerial Lift	63	4.25754	124.0639	68.10814	0.1953	1.28898	1.21086	18440.78	5.97618
	De-Watering Pump	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Emissions Based On	**De-Watering Pump**	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Fixed Operational Hours	**Water Truck**	402	481.194	2861.094	4177.983	10.6932	153.9821	141.1502	1014875	327.2119
	Total Non-Haul Engines, Non-Dewater		2747.943	16275.59	26504.56	58.743	981.6047	907.4356	5500581	1775.867
	Total Haul Engines		1870.512	12354.44	17032.38	31.92	676.704	625.632	3019575	976.752
			0	0	0	0	0	0	0	0
Permitted Emissions	**Recycle Generator Set**	1015	2544.727	11377.66	37939.56	52.577	830.7166	830.7166	5975902	220.8234
	Reservoir Pump Generator Set	600	678.432	3569.76	6599.616	17.76	198.912	198.912	2018598	60.384

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	135.108	550.3464	1406.678	10.1088	54.0432	54.0432	110477.3	12.0528
	982 Loader	400	98.352	408.384	1017.504	7.2	39.6	39.6	81835.2	8.784
	980 Loader	390	95.8932	398.1744	992.0664	7.02	38.61	38.61	79789.32	8.5644
	390 Excavator	530	128.896	441.4688	1387.243	10.4728	50.5514	50.5514	114455.4	11.4798
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Skid Steer	65	32.20295	95.9114	184.0547	1.443	17.1236	17.1236	13667.59	2.886
	Telehandler/Aerial Lift	63	26.1702	76.12794	157.7829	1.15227	12.71403	12.71403	11098.88	2.3436
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	102.1964	356.2363	1046.1	7.638	39.7176	39.7176	86813.36	9.1656
	Total Non-Haul Engines, Non-Dewater		618.8188	2326.649	6191.43	45.03487	252.3598	252.3598	498137.1	55.2762
	Total Haul Engines		308.712	1062.48	3215.712	23.712	120.384	120.384	259144.3	27.816
Permitted Emissions	**Recycle Generator Set**	1015	538.5387	2042.241	5694.84	38.3061	191.5305	191.5305	426849.4	48.0704
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	52.6824	271.5826	513.3948	0.972	19.8288	18.2736	89823.45	28.9656
	982 Loader	400	38.016	220.2077	375.8933	0.72	13.968	12.96	67381.59	21.744
	980 Loader	390	37.0656	214.7025	366.4959	0.702	13.6188	12.636	65697.05	21.2004
	390 Excavator	530	33.231	231.5657	325.978	1.007	11.2784	10.4728	94566.77	30.6128
	Haul Truck	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Haul Truck	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Skid Steer	65	4.2809	78.80872	56.89941	0.12025	2.3088	2.14045	11351.06	3.67965
	Telehandler/Aerial Lift	63	2.12877	62.03197	34.05407	0.09765	0.64449	0.60543	9220.39	2.98809
	De-Watering Pump	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
	Water Truck	402	34.371	204.3639	298.4274	0.7638	10.99872	10.08216	72491.04	23.37228
	Total Non-Haul Engines, Non-Dewater		201.7757	1283.263	1971.143	4.3827	72.64601	67.17044	410531.3	132.5628
	Total Haul Engines		133.608	882.4603	1216.599	2.28	48.336	44.688	215683.9	69.768
Permitted Emissions	**Recycle Generator Set**	1015	181.7662	812.6902	2709.969	3.7555	59.3369	59.3369	426850.1	15.7731
	Reservoir Pump Generator Set	600	84.804	446.22	824.952	2.22	24.864	24.864	252324.8	7.548

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	319.436	1301.185	3325.811	23.90025	127.7744	127.7744	261201.7	28.49645
	982 Loader	400	232.5337	965.5428	2405.686	17.02297	93.62633	93.62633	193483.1	20.76802
	980 Loader	390	226.7204	941.4042	2345.544	16.59739	91.28567	91.28567	188646	20.24882
	390 Excavator	530	293.7127	1005.966	3161.083	23.86416	115.1904	115.1904	260807.2	26.15879
	Haul Truck	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Haul Truck	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Skid Steer	65	44.42281	132.3063	253.8967	1.990566	23.62139	23.62139	18853.95	3.981133
	Telehandler/Aerial Lift	63	36.10085	105.0157	217.6558	1.589515	17.53855	17.53855	15310.5	3.232912
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	563.9052	1965.661	5772.231	42.14538	219.156	219.156	479023.5	50.57446
	Total Non-Haul Engines, Non-Dewater		1716.832	6417.08	17481.91	127.1102	688.1928	688.1928	1417326	153.4606
	Total Haul Engines		1438.567	4951.051	14984.9	110.4955	560.9774	560.9774	1207587	129.6198
Permitted Emissions	**Recycle Generator Set**	1015	339.2213	1286.392	3587.135	24.12871	120.6436	120.6436	268869.1	30.27917
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/year) ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	124.5571	642.1031	1213.82	2.298101	46.88126	43.20429	212369.7	68.4834
	982 Loader	400	89.88127	520.6373	888.7249	1.702297	33.02456	30.64134	159310.4	51.40936
	980 Loader	390	87.63424	507.6213	866.5068	1.659739	32.19894	29.87531	155327.6	50.12413
	390 Excavator	530	75.72281	527.664	742.7994	2.29463	25.69986	23.86416	215487.4	69.75677
	Haul Truck	600	311.3	2056.088	2834.615	5.312286	112.6205	104.1208	502532.7	162.556
	Haul Truck	600	311.3	2056.088	2834.615	5.312286	112.6205	104.1208	502532.7	162.556
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	5.905347	108.7138	78.49069	0.165881	3.184906	2.952673	15658.37	5.075944
	Telehandler/Aerial Lift	63	2.936561	85.57086	46.97636	0.134705	0.889051	0.835169	12719.2	4.121962
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
	Water Truck	402	189.6542	1127.65	1646.679	4.214538	60.68935	55.6319	399995.1	128.9649
	Total Non-Haul Engines, Non-Dewater		576.2915	3519.961	5483.997	12.46989	202.5679	187.0048	1170868	377.9364
	Total Haul Engines		622.5999	4112.177	5669.229	10.62457	225.2409	208.2416	1005065	325.1119
Permitted Emissions	**Recycle Generator Set**	1015	114.4931	511.9072	1706.988	2.36556	37.37585	37.37585	268869.6	9.935352
	Reservoir Pump Generator Set	600	73.28864	385.6287	712.9335	1.918551	21.48777	21.48777	218062.1	6.523073

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	4.17007	16.98629	43.41673	0.312005	1.668028	1.668028	3409.851	0.372006
	982 Loader	400	3.035607	12.60466	31.40497	0.222226	1.222243	1.222243	2525.82	0.271116
	980 Loader	390	2.959716	12.28954	30.61985	0.21667	1.191687	1.191687	2462.675	0.264338
	390 Excavator	530	3.978339	13.62581	42.81687	0.32324	1.560255	1.560255	3532.634	0.354321
	Haul Truck	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Haul Truck	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Skid Steer	65	0.141991	0.422897	0.811542	0.006363	0.075502	0.075502	60.26376	0.012725
	Telehandler/Aerial Lift	63	0.115391	0.335667	0.695703	0.005081	0.056059	0.056059	48.93768	0.010334
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	3.154264	10.99513	32.28759	0.235745	1.225872	1.225872	2679.47	0.282894
	Total Non-Haul Engines, Non-Dewater		17.55538	67.25999	182.0533	1.321329	6.999646	6.999646	14719.65	1.567733
	Total Haul Engines		9.528308	32.79314	99.25204	0.731864	3.715618	3.715618	7998.417	0.858533
Permitted Emissions	**Recycle Generator Set**	1015	16.62184	63.03319	175.7696	1.182307	5.911535	5.911535	13174.59	1.483679
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

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Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	1.626027	8.382321	15.84579	0.030001	0.61201	0.564009	2772.375	0.894015
	982 Loader	400	1.173353	6.796648	11.60184	0.022223	0.431118	0.400007	2079.714	0.671122
	980 Loader	390	1.144019	6.626731	11.31179	0.021667	0.42034	0.390007	2027.721	0.654344
	390 Excavator	530	1.025665	7.147209	10.06122	0.031081	0.348105	0.32324	2918.776	0.944855
	Haul Truck	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
	Haul Truck	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	0.018876	0.347487	0.250883	0.00053	0.01018	0.009438	50.04959	0.016224
	Telehandler/Aerial Lift	63	0.009386	0.273514	0.150153	0.000431	0.002842	0.002669	40.65496	0.013175
	De-Watering Pump	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
	De-Watering Pump	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
	Water Truck	402	1.060851	6.307633	9.210876	0.023574	0.339472	0.311183	2237.415	0.721379
	Total Non-Haul Engines, Non-Dewater		6.058178	35.88154	58.43255	0.129506	2.164068	2.000553	12126.71	3.915116
	Total Haul Engines		4.123773	27.23689	37.54998	0.070372	1.491877	1.379282	6657.022	2.15337
Permitted Emissions	**Recycle Generator Set**	1015	5.610162	25.08345	83.64242	0.115912	1.831417	1.831417	13174.61	0.486832
	Reservoir Pump Generator Set	600	1.495687	7.869974	14.54966	0.039154	0.438526	0.438526	4450.247	0.133124

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.297862	1.213306	3.101195	0.022286	0.119145	0.119145	243.5608	0.026572
	982 Loader	400	0.216829	0.900333	2.243212	0.015873	0.087303	0.087303	180.4157	0.019365
	980 Loader	390	0.211408	0.877824	2.187132	0.015476	0.08512	0.08512	175.9053	0.018881
	390 Excavator	530	0.284167	0.973272	3.058348	0.023089	0.111447	0.111447	252.331	0.025309
	Haul Truck	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Haul Truck	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Skid Steer	65	0.070995	0.211448	0.405771	0.003181	0.037751	0.037751	30.13188	0.006363
	Telehandler/Aerial Lift	63	0.057695	0.167833	0.347852	0.00254	0.02803	0.02803	24.46884	0.005167
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	0.225305	0.785367	2.306257	0.016839	0.087562	0.087562	191.3907	0.020207
	Total Non-Haul Engines, Non-Dewater		1.364262	5.129384	13.64977	0.099285	0.556358	0.556358	1098.204	0.121863
	Total Haul Engines		0.680593	2.342367	7.089431	0.052276	0.265401	0.265401	571.3155	0.061324
Permitted Emissions	**Recycle Generator Set**	1015	1.187275	4.50237	12.55497	0.08445	0.422252	0.422252	941.0418	0.105977
	Reservoir Pump Generator Set	600	0	0	0	0	0	0	0	0

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.116145	0.598737	1.131842	0.002143	0.043715	0.040286	198.0268	0.063858
	982 Loader	400	0.083811	0.485475	0.828703	0.001587	0.030794	0.028572	148.551	0.047937
	980 Loader	390	0.081716	0.473338	0.807985	0.001548	0.030024	0.027858	144.8372	0.046739
	390 Excavator	530	0.073262	0.510515	0.718658	0.00222	0.024865	0.023089	208.484	0.06749
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Skid Steer	65	0.009438	0.173743	0.125442	0.000265	0.00509	0.004719	25.0248	0.008112
	Telehandler/Aerial Lift	63	0.004693	0.136757	0.075076	0.000215	0.001421	0.001335	20.32748	0.006588
	De-Watering Pump	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
	Water Truck	402	0.075775	0.450545	0.65792	0.001684	0.024248	0.022227	159.8154	0.051527
	Total Non-Haul Engines, Non-Dewater		0.444839	2.829111	4.345626	0.009662	0.160157	0.148085	905.0667	0.292251
	Total Haul Engines		0.294555	1.945492	2.682141	0.005027	0.106563	0.09852	475.5016	0.153812
Permitted Emissions	**Recycle Generator Set**	1015	0.400726	1.791675	5.974459	0.008279	0.130815	0.130815	941.0435	0.034774
	Reservoir Pump Generator Set	600	0.186961	0.983747	1.818708	0.004894	0.054816	0.054816	556.2809	0.01664

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Average Emissions (Mitigated)

Aggregates Fugitive Mining, Storage, and Sitewide Drop Emissions

Drops from stationary equipment (i.e., conveyors) are included in the plant emissions calculations.

Drop, Mining, and Storage Pile Emissions Factors

Material Drop Emission Factor from AP42 13.2.4:

PM10 E.F. (lb/ton) = $k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$

k = particle size multiplier =	0.35
U = mean wind speed[1] =	4.9
M = material moisture content =	3
PM10 EF (lb/ton) =	0.00062
PM2.5 EF[2] (lb/ton) =	0.00018

Bulldozing Emission Factor, CalEEMod User Manual, Appendix A:

EF PM10 (lb/hr) = 1.0 * s^1.5 / 7.9 * 0.75 =	0.67	
EF PM2.5 (lb/hr) = 5.7 * s^1.2 / 7.9 * 0.105 =	0.09	
s (silt, %) =	6.9	
Watering C.E. =	61%	water every 3 hours if material is not already wet
days of rain =	51	

Quarry Operation Fugitive Emissions:

lbs PM10 / Ton Quarried[3] =	0.021
lbs PM2.5/lbs PM10 =	0.292

Storage Pile Emissions Controlled Factor from SSP1610 - Aggregate Processing:

lb PM10/acre/day 1.054

	Area (acres)	lbs PM10/hr	lbs PM10/day	lbs PM10/yr
Baseline Storage	2	0.1	2.1	769.4
Project Storage	2	0.1	2.1	769.4

Notes:

[1] Mean wind speed based on data for Tulare in Table 1 of CalEEMod User Manual Appendix D which states 2.2 m/s (equvalent to 4.921 mph).

[2] PM2.5 emission factor assumed to be 29.2% of PM10 for material drops based on SCAQMD's *Updated CEIDARS Table with PM2.5 Fractions for mineral products - loading*

[3] Emission Factor from San Diego Air Pollution Control District, *Quarry Operations, General* (https://bit.ly/2XXNWUI)

Drop and Mining Emissions - Baseline

Activity	Throughput			PM10 Emissions			PM2.5 Emissions		
	Peak Hour (tph)	Peak Day (tpd)	Avg Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Avg Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Avg Annual (lb/yr)
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	650	4,000	500,000	0.4	2	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Plant	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Export Trucks	650	4,000	500,000	0.4	2	311	0.1	1	91

Drop and Mining Emissions - Project

Activity	Throughput			PM10 Emissions			PM2.5 Emissions		
	Peak Hour (tph)	Peak Day (tpd)	Avg Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Avg Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Avg Annual (lb/yr)
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	700	7,000	500,000	0.4	4	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	700	7,000	500,000	0.4	4	311	0.1	1	91
Loader to Plant	700	7,000	500,000	0.4	4	311	0.1	1	91
Loader to Export Trucks	700	7,000	500,000	0.4	4	311	0.1	1	91

Average Emissions (Mitigated)

Recycle Plant - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.002367
Basline Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	0.8284
Total PM2.5 Emissions, lb/hr	0.24

	Max (ton/hr)
Processing	350

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	350	9	*Truck Unloading Stone*	0.000016	0.0056
3	Hopper	Conveyor 1	0	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
4	Conveyor 1	Jaw Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
5	Jaw Crusher	Conveyor 2	215	350	2	*Primary Crushing*	0.000540	0.1890
6	Conveyor 2	Screen 1	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
7	Screen 1	Conveyor 3, 4, 5	60	350	1	*Screening*	0.000740	0.2590
8	Conveyor 3	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
9	Conveyor 4	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
10	Conveyor 5	Conveyor 6	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
11	Conveyor 6	Cone Crusher	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
12	Cone Crusher	Conveyor 7, 8	200	245	3	*Secondary Crushing*	0.000540	0.1323
13	Conveyor 7	Conveyor 9	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
14	Conveyor 8	Screen 2	200	184	7	*Conv. Transfer Pt.*	0.000046	0.0085
15	Conveyor 9	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
16	Screen 2	Conveyor 10, 11, 12	60	184	1	*Screening*	0.000740	0.1360
17	Conveyor 10	Conveyor 13	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
18	Conveyor 11	Conveyor 14	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
19	Conveyor 12	Conveyor 15	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
20	Conveyor 13	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
21	Conveyor 14	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
22	Conveyor 15	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Description	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drilling	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Average Emissions (Mitigated)

Recycle Plant - Project

Project Factor PM10 Emissions (lbs/ton)	0.002367
Project Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	0.8284
Total PM2.5 Emissions, lb/hr	0.24

	Max (ton/hr)
Processing	350

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	350	9	*Truck Unloading Stone*	0.000016	0.0056
3	Hopper	Conveyor 1	0	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
4	Conveyor 1	Jaw Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
5	Jaw Crusher	Conveyor 2	215	350	2	*Primary Crushing*	0.000540	0.1890
6	Conveyor 2	Screen 1	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
7	Screen 1	Conveyor 3, 4, 5	60	350	1	*Screening*	0.000740	0.2590
8	Conveyor 3	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
9	Conveyor 4	Pile	20	53	7	*Conv. Transfer Pt.*	0.000046	0.0024
10	Conveyor 5	Conveyor 6	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
11	Conveyor 6	Cone Crusher	20	245	7	*Conv. Transfer Pt.*	0.000046	0.0113
12	Cone Crusher	Conveyor 7, 8	200	245	3	*Secondary Crushing*	0.000540	0.1323
13	Conveyor 7	Conveyor 9	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
14	Conveyor 8	Screen 2	200	184	7	*Conv. Transfer Pt.*	0.000046	0.0085
15	Conveyor 9	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
16	Screen 2	Conveyor 10, 11, 12	60	184	1	*Screening*	0.000740	0.1360
17	Conveyor 10	Conveyor 13	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
18	Conveyor 11	Conveyor 14	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
19	Conveyor 12	Conveyor 15	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
20	Conveyor 13	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
21	Conveyor 14	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
22	Conveyor 15	Pile	20	61	7	*Conv. Transfer Pt.*	0.000046	0.0028
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Average Emissions (Mitigated)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000108
Basline Factor PM2.5 Emissions (lbs/ton)	0.000031536
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	650

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Descriptio	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drillin	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Average Emissions (Mitigated)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000100286
Basline Factor PM2.5 Emissions (lbs/ton)	2.92834E-05
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	700

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Average Emissions (Mitigated)

Truck Loading and Maneuvering	Baseline	Project		
Excavator Production Rate	691	691	tons/hour	4.3 cy bucket cycle time analysis
Truck payload	50	50	tons	
Time to load a truck	4.3	4.3	minutes	Calculation
Time to maneuver	0.8	0.8	minutes	Caterpillar Handbook (44 ed.)
Total time load and maneuver	5.1	5.1	minutes	Calculation
Haul Road Length	0.3	0.6	miles	Assumes avg. trip to be half of site length/longest path
Truck Haul Avg Speed	30.0	30.0	mph	
Haul Time	0.6	1.2	minutes	
Total Time Per Load	5.7	6.3	minutes	
Material transported by Truck	100%	100%	Percent of total material	
VMT/Ton Transferred	0.012	0.024		
Operating Hour/Ton Transferred	0.0038	0.0042		
Vehicle HP	600	600		
HP-HR/Ton Transferred	2.30	2.54		
lb PM10 Ems/Ton Transferred	0.025	0.025	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM2.5 Ems/Ton Transferred	0.005	0.005	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM10 Ems/Ton Processed	0.025	0.025	Takes into account percent of total material transported by truck	
lb PM2.5 Ems/Ton Processed	0.005	0.005	Takes into account percent of total material transported by truck	
Annual Rainfall Reduction Factor	0.860273973	0.860274		

Average Emissions (Mitigated)

Basline Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
Control efficiency for unpaved roads in baseline is 80% for watering.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Basline Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2
Control efficiency for unpaved roads in baseline is 80% for watering.

Future Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Future C.E. =	90%	90%	90%	90%
Future EF (lb/VMT) =	**1.03**	**0.22**	**0.70**	**0.15**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Future Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2

Average Emissions (Mitigated)

Source: EMFAC2021 (v1.0.0) Emission Rates
Region Type: Sub-Area
Region: Tuolumne (MC)
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, g/mile for RUNEX, PMBW and PMTW, mph for Speed

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Total VMT	CVMT	EVMT	NOx_RUNEX
Tuolumne (MC)	2021	T7 Tractor Class 8	2021	15	Diesel	0.051113349	0.051113349	0	2.951511768

PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	SOx_RUNEX	NH3_RUNEX	PM10_PMBW	PM2.5_PMBW
0.003375524	0.00352815	1891.421977	0.000909605	0.297994303	0.019583553	0.022294384	0.2189903	0.017910635	0.22	0.135264231	0.047342481

Emissions (lbs)

	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	25	20000	32000	1.38158	15.44931	208.22303	1.26356	0.24890	0.23814	133435.89368	0.06417	49.33072	10.45811
On-Road Truck Emissions Daily	1.6	25	280	448	0.01934	0.21629	2.91512	0.01769	0.00348	0.00333	1868.10251	0.00090	0.69063	0.14641
On-Road Truck Emissions Hourly	1.6	25	28	44.8	0.00193	0.02163	0.29151	0.00177	0.00035	0.00033	186.81025	0.00009	0.06906	0.01464

	Baseline Tonnage		Project Tonnage		Recycle Plant Tonnage - Baseline and Excavation
	Gross	Net	Gross	Net	
Annual	714,286	500,000	928,571	650,000	100,000
Daily	6,000	4,000	6,000	7,000	2,600
Houlry	1,000	650	1,000	700	500

Max Year Emissions (Pre-mitigation)

		Baseline (lbs/year) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									236.68	69.11	236.68	69.11	0
	Recycle Engine	237.45	900.47	2,510.99	16.89	84.45	84	188,208.36	21.20			84.45	84.45	188,801.83
	Aggregates Plant Fugitive Ems.									54	16	54.00	15.77	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000	4,380	0
	Offroad Engines	1,717	6,417	17,482	127	688	688	1,417,326	153			688	688	1,421,623
	Aggregates Transfer/Drops									1,244	363	1,244	363	0
	Off-Road Vehicle Haul	1,439	4,951	14,985	110	561	561	1,207,587	130	10,631	2,254	11,192	2,815	1,211,216
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**3,393**	**12,269**	**34,978**	**254**	**1,334**	**1,334**	**2,813,121**	**304**	**27,935**	**7,306**	**29,268**	**8,640**	**2,821,641**

		Baseline (lbs/day) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6.15	1.80	6.15	1.80	0.00
	Recycle Engine	16.62	63.03	175.77	1.18	5.91	6	13,174.59	1.48			5.91	5.91	13,216.13
	Aggregates Plant Fugitive Ems.									0.43	0.13	0.43	0.13	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Offroad Engines	17.6	67.3	182.1	1.3	7.0	7.0	14,719.7	1.6			7.00	7.00	14,764
	Aggregates Transfer/Drops									10	3	9.95	2.91	0
	Off-Road Vehicle Haul Emissions	10	33	99	1	4	4	7,998	1	99	21	102.57	24.67	8,022
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**44**	**163**	**457**	**3**	**17**	**17**	**35,893**	**4**	**244**	**63**	**260**	**80**	**36,002**

		Baseline (lbs/hr) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1.18	0.35	1.18	0.35	0.00
	Recycle Engine	1.19	4.50	12.55	0.08	0.42	0.42	941.04	0.11			0.42	0.42	944.01
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Offroad Engines	1.4	5.1	13.6	0.1	0.6	0.6	1,098.2	0.1			0.56	0.56	1,102
	Aggregates Transfer/Drops									2	0	1.62	0.47	0
	Off-Road Vehicle Haul Emissions	1	2	7	0.1	0.3	0.3	571	0.06	16	3	16.33	3.67	573
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**3**	**12**	**33**	**0.2**	**1**	**1**	**2,611**	**0**	**40**	**10**	**41**	**12**	**2,619**

*CO2e Calculated based on IPCC Fifth Assessment Report (AR5)
Assumes GWP factor of: 28 for Methane

Max Year Emissions (Pre-mitigation)

		Years 1 - 20 (lbs/year) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									237	69	236.68	69.11	0.00
	Recycle Engine	80	358	1,195	2	26	26	188,209	7			26.16	26.16	188,403.42
	Aggregates Plant Fugitive Ems.									65	19	65.19	19.03	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									19,500	5,694	19,500.00	5,694.00	0
	Offroad Engines	690	4,179	6,598	15	244	225	1,393,616	450			243.91	225.28	1,406,213
	Aggregates Transfer/Drops									1,617	6,166	1,616.86	6,166.12	0
	Off-Road Vehicle Haul	809	5,346	7,370	14	293	271	1,306,585	422.65	34,471	7,308	34,764	7,579	1,318,419
	De-watering Pumps	277	1,542	1,517	3	76	76	208,844	24.99			75.70	75.70	209,543
	On-Road Vehicles	2	20	271	2	0.32	0.3	173,467	0.08	110.34	23.39	110.66	23.70	173,469
	Slurry Wall Construction	673	4674	6518	14	265	251	1340543	360	291	85	556.79	336.25	1,350,617
	Total Emissions	**2,531**	**16,120**	**23,468**	**49**	**904**	**849**	**4,611,263**	**1,264**	**57,061**	**19,589**	**57,965**	**20,439**	**4,646,664**

		Years 1 - 20 (lbs/day) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6	2	6.15	1.80	0.00
	Recycle Engine	5.6	25.1	83.6	0.1	1.8	1.8	13,174.6	0.5			1.83	1.83	13,188.24
	Aggregates Plant Fugitive Ems.									1	0	0.70	0.20	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Offroad Engines	6.1	35.9	58.4	0.1	2.2	2.0	12,126.7	3.9			2.16	2.00	12,236
	Aggregates Transfer/Drops									17	42	17.41	41.88	0
	Off-Road Vehicle Haul Emissions	4	27	38	0.1	1	1	6,657	2.15	367.35	77.88	368.84	79.26	6,717
	De-watering Pumps	1.8	9.9	9.7	0.02	0.5	0.5	1,335	0.16			0.48	0.48	1,340
	On-Road Vehicles	0.02	0.2	2.9	0.02	0.0	0.003	1,868	0.001	1.38	0.29	1.38	0.30	1868.127667
	Slurry Wall Construction	2.9	20.3	28.5	0.1	1.3	1.2	5105.2	1.4	1	0.3	2.22	1.46	5143.95939
	Total Emissions	**20**	**119**	**221**	**0.40**	**7**	**7**	**40,267**	**8**	**522**	**160**	**529**	**167**	**40,494**

		Years 1 - 20 (lbs/hr) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1	0.3	1.18	0.35	0.00
	Recycle Engine	0.40	1.79	5.97	0.01	0.13	0.13	941.04	0.03			0.13	0.13	942.02
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Offroad Engines	0.4	2.8	4.3	0.0	0.2	0.1	905.1	0.3			0.16	0.15	913
	Aggregates Transfer/Drops									1.7	6.6	1.74	6.64	0
	Off-Road Vehicle Haul Emissions	0	2	3	0	0	0	476	0.15	37.27	7.90	37.38	8.00	480
	De-watering Pumps	0.07	0.41	0.40	0.001	0.02	0.02	55.63	0.01			0.02	0.02	56
	On-Road Vehicles	0.00	0.02	0.29	0.002	0.00035	0.00	186.81	0.00	0.14	0.03	0.14	0.03	186.8
	Slurry Wall Construction	0.43	3.01	4.19	0.01	0.19	0.18	752.45	0.20	0.12	0.03	0.31	0.21	758.0
	Total Emissions	**2**	**10**	**18**	**0.03**	**1**	**1**	**3,317**	**1**	**62**	**21**	**62**	**22**	**3,336**

Max Year Emissions (Pre-mitigation)

		Years 21 - 50 (lbs/year) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	62.88	559.07	187.50	3	6.29	6	324,868.025	5.145			6.29	6.29	325,012
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	21	241	96	0.5	1.5	2	50,466	2			1.54	1.54	50,518
	Aggregates Transfer/Drops											0.00	0.00	0
	Off-Road Vehicle Haul													
	De-watering Pumps													
	On-Road Vehicles	0.1	1	16	0.1	0.02	0.02	10,550	0.01	7.80	1.65	7.82	1.67	10549.92
	Slurry Wall Construction													
	Total Emissions	**84**	**802**	**300**	**3**	**8**	**8**	**385,883**	**7**	**8**	**2**	**16**	**10**	**386,080**

		Years 21 - 50 (lbs/day) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	0.86	7.66	2.57	0.04	0.09	0.1	4,450.247	0.070			0.09	0.09	4,452
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	0.2	1	1	0.004	0.01	0.01	483	0.02			0.01	0.01	483
	Aggregates Transfer/Drops													
	Off-Road Vehicle Haul Emissions													
	De-watering Pumps													
	On-Road Vehicles	0.002	0.02	0.3	0.002	0.0004	0.0004	211	0.0001	0.16	0.03	0.16	0.03	210.9983
	Slurry Wall Construction													
	Total Emissions	**1**	**9**	**3**	**0.05**	**0.1**	**0.1**	**5,144**	**0.1**	**0.2**	**0.0**	**0.3**	**0.13**	**5,147**

		Years 21 - 50 (lbs/hr) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	0.11	0.96	0.32	0.005	0.01	0.01	556.281	0.009			0.01	0.01	557
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	0.1	1	0.3	0.002	0.006	0.006	241	0.01			0.01	0.01	242
	Aggregates Transfer/Drops													
	Off-Road Vehicle Haul Emissions													
	De-watering Pumps													
	On-Road Vehicles	0.0004	0.005	0.07	0.0004	0.0001	0.0001	41.7	0.0000	0.03	0.007	0.03	0.01	41.69928
	Slurry Wall Construction													
	Total Emissions	**0.2**	**2**	**1**	**0.01**	**0.02**	**0.02**	**839**	**0.02**	**0.03**	**0.01**	**0.05**	**0.02**	**840**

Max Year Emissions (Pre-mitigation)

Road Based Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	2.10E-05
7440393	Barium	1.45E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	2.50E-05
18540299	Hexavalent Chromium	1.25E-06
7440508	Copper	4.00E-05
7439921	Lead	3.00E-05
7439965	Manganese	4.90E-04
7440020	Nickel	1.90E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	1.12E-04

From SDACPD "H03 - Haul Roads, Mineral Industry Sites..."
https://bit.ly/39VKJKC
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Quarrying Fugitive Emissions		
7440382	Arsenic	2.0E-05
7440417	Beryllium	0.000001
7440439	Cadmium	0.000001
7440473	Chromium	5.00E-05
18540299	Haxavalent Chromium	2.50E-06
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	2.00E-04

From SDACPD " Q01 - Quarry Operations, General..."
https://bit.ly/3oeslls

Aggregates Processing Fugative Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	1.00E-06
7440393	Barium	2.25E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
18540299	Hexavalent Chromium	1.40E-06
7440473	Chromium	2.80E-05
7440484	Cobalt	1.10E-05
7440508	Copper	3.70E-05
7439921	Lead	5.00E-05
7439965	Manganese	5.30E-04
7440020	Nickel	2.80E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	9.90E-05

From SDACPD "T01 - Transfer Point, Process Material..."
(same speciation as S01 for Screening and C01 for Crushing)
https://bit.ly/2Y9f5E7
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Storage Fugitive Emissions - SJAPCD Prof. ID 207		
7440382	Arsenic	2.00E-05
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	5.00E-05
18540299	Hexavalent Chromium	2.50E-07
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
7440666	Zinc	2.00E-04

From SJVAPCD Document, "AB2588 'Hots Spots' Air Toxics Profiles"
March 27, 2017

Max Year Emissions (Pre-mitigation)

Description	Equipment	Load Factor	HP	Cubic Yards
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.43	165	N/A
Slurry Wall Excavation	Excavator	0.38	429	109,000
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.38	300	119,000
Plug Mill for Sieving Native Soils	Generator	0.74	100	N/A
Mixing and Moving Slurry Mix	Loader	0.36	349	119,000
Construction Slurry Pump	Generator	0.74	84	N/A
Dust Control	Water Truck	0.38	230	N/A

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	Daily Operating hours	Operating Days	Annual HP-HR	Daily HP-HR	Houlry HP-HR	Annual Tons Material Handled*	Daily Tons Material Handled*	Hourly Tons Material Handled*
Clear/Grub, Haul Road, Construction Ponds	Dozer	8	4	2270.4	567.6	70.95			
Slurry Wall Excavation	Excavator	8	321	418635.36	1304.16	163.02	147150	458	57
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	8	372	339264	912	114	160650	432	54
Plug Mill for Sieving Native Soils	Generator	4	201	59496	296	74			
Mixing and Moving Slurry Mix	Loader	8	248	249269.76	1005.12	125.64	160650	647.8	81.0
Construction Slurry Pump	Generator	8	321	159626.88	497.28	62.16			
Dust Control	Water Truck	2	100	17480	174.8	87.4			

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions Factor (g/hp-hr)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.476	3.33989	4.87226	0.005	0.272	0.25	471.015	0.152
Slurry Wall Excavation	Excavator	0.153	1.1016	1.57199	0.005	0.052	0.048	470.2956	0.152
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.246	1.41417	2.34677	0.005	0.086	0.079	474.5787	0.153
Plug Mill for Sieving Native Soils	Generator	0.364	3.38	3.173	0.006	0.179	0.179	568.299	0.032
Mixing and Moving Slurry Mix	Loader	0.289	1.6304	3.01666	0.005	0.112	0.103	466.7831	0.151
Construction Slurry Pump	Generator	0.364	3.38	3.173	0.006	0.179	0.179	568.299	0.032
Dust Control	Water Truck	0.275	1.39106	2.50726	0.005	0.098	0.09	470.1675	0.152

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (g/year)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	1081	7583	11062	11	618	568	1069392	345
Slurry Wall Excavation	Excavator	64051	461169	658091	2093	21769	20094	196882368	63633
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	83459	479777	796175	1696	29177	26802	161007468	51907
Plug Mill for Sieving Native Soils	Generator	21657	201096	188781	357	10650	10650	33811517	1904
Mixing and Moving Slurry Mix	Loader	72039	406409	751962	1246	27918	25675	116354911	37640
Construction Slurry Pump	Generator	58104	539539	506496	958	28573	28573	90715796	5108
Dust Control	Water Truck	4807	24316	43827	87	1713	1573	8218528	2657

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (g/day)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	270	1896	2765	3	154	142	267348	86
Slurry Wall Excavation	Excavator	200	1437	2050	7	68	63	613341	198
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	224	1290	2140	5	78	72	432816	140
Plug Mill for Sieving Native Soils	Generator	108	1000	939	2	53	53	168217	9
Mixing and Moving Slurry Mix	Loader	290	1639	3032	5	113	104	469173	152
Construction Slurry Pump	Generator	181	1681	1578	3	89	89	282604	16
Dust Control	Water Truck	48	243	438	1	17	16	82185	27

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (g/hr)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	34	237	346	0.4	19	18	33419	11
Slurry Wall Excavation	Excavator	25	180	256	0.8	8	8	76668	25
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	28	161	268	0.6	10	9	54102	17
Plug Mill for Sieving Native Soils	Generator	27	250	235	0.4	13	13	42054	2
Mixing and Moving Slurry Mix	Loader	36	205	379	0.6	14	13	58647	19
Construction Slurry Pump	Generator	23	210	197	0.4	11	11	35325	2
Dust Control	Water Truck	24	122	219	0.4	9	8	41093	13

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (lb/year)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	2	17	24	0.03	1	1	2358	1
Slurry Wall Excavation	Excavator	141	1017	1451	5	48	44	434051	140
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	184	1058	1755	4	64	59	354961	114
Plug Mill for Sieving Native Soils	Generator	48	443	416	1	23	23	74542	4
Mixing and Moving Slurry Mix	Loader	159	896	1658	3	62	57	256519	83
Construction Slurry Pump	Generator	128	1189	1117	2	63	63	199994	11
Dust Control	Water Truck	11	54	97	0.2	4	3	18119	6

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (lb/day)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.6	4.2	6.1	0.006	0.3	0.3	589	0.19
Slurry Wall Excavation	Excavator	0.4	3.2	4.5	0.014	0.1	0.1	1352	0.44
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.5	2.8	4.7	0.010	0.2	0.2	954	0.31
Plug Mill for Sieving Native Soils	Generator	0.2	2.2	2.1	0.004	0.1	0.1	371	0.02
Mixing and Moving Slurry Mix	Loader	0.6	3.6	6.7	0.011	0.2	0.2	1034	0.33
Construction Slurry Pump	Generator	0.4	3.7	3.5	0.007	0.2	0.2	623	0.04
Dust Control	Water Truck	0.1	0.5	1.0	0.002	0.04	0.03	181	0.06

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

Description	Equipment	2020 Project Emissions (lb/hr)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.0745	0.5224	0.7621	0.0008	0.0425	0.0391	73.6752	0.0238
Slurry Wall Excavation	Excavator	0.0550	0.3959	0.5650	0.0018	0.0187	0.0173	169.0231	0.0546
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.0618	0.3554	0.5898	0.0013	0.0216	0.0199	119.2744	0.0385
Plug Mill for Sieving Native Soils	Generator	0.0594	0.5514	0.5176	0.0010	0.0292	0.0292	92.7135	0.0052
Mixing and Moving Slurry Mix	Loader	0.0800	0.4516	0.8356	0.0014	0.0310	0.0285	129.2937	0.0418
Construction Slurry Pump	Generator	0.0499	0.4632	0.4348	0.0008	0.0245	0.0245	77.8793	0.0044
Dust Control	Water Truck	0.0530	0.2680	0.4831	0.0010	0.0189	0.0173	90.5938	0.0293

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	Opp-Hour/Ton Processed	Load Factor	Hp-Hr/Ton Processed	Max Daily Opp-Hr
	988 Loader	540	0.001501	0.36	0.29	14
	982 Loader	400	0.001501	0.36	0.22	14
	980 Loader	390	0.001501	0.36	0.21	14
Emissions Based On	**390 Excavator**	530	0.001447	0.38	0.29	14
Cycle Time	**Haul Truck**	600	0.004227	0.38	0.96	14
Analysis/Throughput	**Haul Truck**	600	0.004227	0.38	0.96	14
	Skid Steer	65	N/A*	0.37	N/A	2
	Telehandler/Aerial Lift	63	N/A*	0.31	N/A	2
	De-Watering Pump	30	N/A*	0.74	N/A	24
Emissions Based On	**De-Watering Pump**	30	N/A*	0.74	N/A	24
Fixed Operational Hours	**Water Truck**	402	N/A*	0.38	N/A	14
	Total Excavation Non-Haul Engines, Non-Dewater					
	Total Haul Engines					
Permitted Emissions	**Recycle Generator Set**	1015	0.002	0.74	1.50	14

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truck HP, which is based on Cat 772 or equivalent truck v

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is conservatively estimated based on the 2005 emission year (App D Table 3.4)

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conservatively estimated based on 2020 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based on cycle time calculations and tonnage throughput

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	Project Excavation		Baseline		Annual Operating Hours	Avg Daily Operating Hours
			Max Annual Hp-Hr	Max Daily Hp-Hr	Max Annual Hp-Hr	Max Daily Hp-Hr		
	988 Loader	540	271024	2721.6	208480	2721.6	502	1.60
	982 Loader	400	200759	2016	154430	2016	502	1.60
	980 Loader	390	195740	1965.6	150569	1965.6	502	1.60
Emissions Based On	**390 Excavator**	530	270615	2819.6	208165	2819.6	511	1.63
Cycle Time	**Haul Truck**	600	626499	3192	481922	3192	1044	3.34
Analysis/Throughput	**Haul Truck**	600	626499	3192	481922	3192	1044	3.34
	Skid Steer	65	15048	48.1	15048	48.1	626	2
	Telehandler/Aerial Lift	63	12220	39.06	12220	39.06	626	2
	De-Watering Pump	30	83345	532.8	0	0	3754	12
Emissions Based On	**De-Watering Pump**	30	83345	532.8	0	0	3754	12
Fixed Operational Hours	**Water Truck**	402	382336	2138.64	382336	2138.64	2503	8
	Total Excavation Non-Haul Engines, Non-Dewater							
	Total Haul Engines							
Permitted Emissions	**Recycle Generator Set**	1015	150220	10515.4	150220	10515.4	148	0.47

HP estimated based on CalEEMod App D for equipment that does not hwith 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.695	2.831	7.236	0.052	0.278	0.278	568.299	0.062
	982 Loader	400	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
	980 Loader	390	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
Emissions Based On	**390 Excavator**	530	0.64	2.192	6.888	0.052	0.251	0.251	568.299	0.057
Cycle Time	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
Analysis/Throughput	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
	Skid Steer	65	1.339	3.988	7.653	0.06	0.712	0.712	568.299	0.12
	Telehandler/Aerial Lift	63	1.34	3.898	8.079	0.059	0.651	0.651	568.299	0.12
	De-Watering Pump	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Emissions Based On	**De-Watering Pump**	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Fixed Operational Hours	**Water Truck**	402	0.669	2.332	6.848	0.05	0.26	0.26	568.299	0.06
	Total Excavation Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.717	2.719	7.582	0.051	0.255	0.255	568.299	0.064

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.271	1.39703	2.64092	0.005	0.102	0.094	462.0548	0.149
	982 Loader	400	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
	980 Loader	390	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
Emissions Based On	**390 Excavator**	530	0.165	1.14978	1.61856	0.005	0.056	0.052	469.547	0.152
Cycle Time	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
Analysis/Throughput	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
	Skid Steer	65	0.178	3.27687	2.36588	0.005	0.096	0.089	471.9774	0.153
	Telehandler/Aerial Lift	63	0.109	3.17624	1.74368	0.005	0.033	0.031	472.1142	0.153
	De-Watering Pump	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Emissions Based On	**De-Watering Pump**	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Fixed Operational Hours	**Water Truck**	402	0.225	1.33781	1.95357	0.005	0.072	0.066	474.542	0.153
	Total Excavation Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.242	1.082	3.608	0.005	0.079	0.079	568.3	0.021

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	144893.7	590207.4	1508563	10840.97	57957.49	57957.49	1.18E+08	12925.77
	982 Loader	400	105475.5	437962.8	1091201	7721.489	42468.19	42468.19	87762439	9420.216
	980 Loader	390	102838.6	427013.8	1063921	7528.451	41406.48	41406.48	85568378	9184.711
Emissions Based On	**390 Excavator**	530	133225.8	456298.5	1433843	10824.6	52249.51	52249.51	1.18E+08	11865.43
Cycle Time	**Haul Truck**	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
Analysis/Throughput	**Haul Truck**	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Skid Steer	65	20149.85	60013.13	115165.6	902.9057	10714.48	10714.48	8552007	1805.811
	Telehandler/Aerial Lift	63	16375.07	47634.34	98727	720.9918	7955.35	7955.35	6944727	1466.424
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	255783.1	891608.6	2618240	19116.82	99407.48	99407.48	2.17E+08	22940.19
	Total Excavation Non-Haul Engines, Non-Dewater		778741.8	2910739	7929660	57656.23	312159	312159	6.43E+08	69608.55
	Total Haul Engines		652523	2245759	6797035	50119.94	254455.1	254455.1	5.48E+08	58794.54
Permitted Emissions	**Recycle Generator Set**	1015	107707.7	408448.2	1138968	7661.22	38306.1	38306.1	85369876	9614.08

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	73447.57	378629	715753.4	1355.121	27644.47	25476.28	1.25E+08	40382.61
	982 Loader	400	53000.3	307004.2	524054.5	1003.794	19473.59	18068.28	93940558	30314.56
	980 Loader	390	51675.29	299329.1	510953.1	978.6987	18986.75	17616.58	91592044	29556.7
	390 Excavator	530	44651.47	311147.7	438006.6	1353.075	15154.44	14071.98	1.27E+08	41133.48
	Haul Truck	600	183564.3	1212414	1671487	3132.496	66408.92	61396.92	2.96E+08	95854.38
	Haul Truck	600	183564.3	1212414	1671487	3132.496	66408.92	61396.92	2.96E+08	95854.38
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	2678.62	49311.74	35602.78	75.24214	1444.649	1339.31	7102518	2302.41
	Telehandler/Aerial Lift	63	1332.002	38814.29	21308.12	61.101	403.2666	378.8262	5769330	1869.691
	De-Watering Pump	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
	De-Watering Pump	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
	Water Truck	402	86025.7	511493.5	746921	1911.682	27528.22	25234.21	1.81E+08	58497.48
	Total Excavation Non-Haul Engines, Non-Dewater		312811	1895730	2992600	6738.714	110635.4	102185.5	6.32E+08	204056.9
	Total Haul Engines		367128.5	2424828	3342975	6264.992	132817.8	122793.8	5.93E+08	191708.8
Permitted Emissions	**Recycle Generator Set**	1015	36353.24	162538	541993.8	751.1	11867.38	11867.38	85370026	3154.62

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	1891.512	7704.85	19693.5	141.5232	756.6048	756.6048	1546683	168.7392
	982 Loader	400	1376.928	5717.376	14245.06	100.8	554.4	554.4	1145693	122.976
	980 Loader	390	1342.505	5574.442	13888.93	98.28	540.54	540.54	1117050	119.9016
Emissions Based On	**390 Excavator**	530	1804.544	6180.563	19421.4	146.6192	707.7196	707.7196	1602376	160.7172
Cycle Time	**Haul Truck**	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
Analysis/Throughput	**Haul Truck**	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Skid Steer	65	64.4059	191.8228	368.1093	2.886	34.2472	34.2472	27335.18	5.772
	Telehandler/Aerial Lift	63	52.3404	152.2559	315.5657	2.30454	25.42806	25.42806	22197.76	4.6872
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	1430.75	4987.308	14645.41	106.932	556.0464	556.0464	1215387	128.3184
	Total Excavation Non-Haul Engines, Non-Dewater		7962.985	30508.62	82577.97	599.3449	3174.986	3174.986	6676722	711.1116
	Total Haul Engines		4321.968	14874.72	45019.97	331.968	1685.376	1685.376	3628021	389.424
Permitted Emissions	**Recycle Generator Set**	1015	7539.542	28591.37	79727.76	536.2854	2681.427	2681.427	5975891	672.9856

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	737.5536	3802.157	7187.528	13.608	277.6032	255.8304	1257528	405.5184
	982 Loader	400	532.224	3082.908	5262.506	10.08	195.552	181.44	943342.2	304.416
	980 Loader	390	518.9184	3005.835	5130.943	9.828	190.6632	176.904	919758.7	296.8056
Emissions Based On	**390 Excavator**	530	465.234	3241.92	4563.692	14.098	157.8976	146.6192	1323935	428.5792
Cycle Time	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
Analysis/Throughput	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
	Skid Steer	65	8.5618	157.6174	113.7988	0.2405	4.6176	4.2809	22702.11	7.3593
	Telehandler/Aerial Lift	63	4.25754	124.0639	68.10814	0.1953	1.28898	1.21086	18440.78	5.97618
	De-Watering Pump	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Emissions Based On	**De-Watering Pump**	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Fixed Operational Hours	**Water Truck**	402	481.194	2861.094	4177.983	10.6932	153.9821	141.1502	1014875	327.2119
	Total Excavation Non-Haul Engines, Non-Dewater		2747.943	16275.59	26504.56	58.743	981.6047	907.4356	5500581	1775.867
	Total Haul Engines		1870.512	12354.44	17032.38	31.92	676.704	625.632	3019575	976.752
Permitted Emissions	**Recycle Generator Set**	1015	2544.727	11377.66	37939.56	52.577	830.7166	830.7166	5975902	220.8234

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	135.108	550.3464	1406.678	10.1088	54.0432	54.0432	110477.3	12.0528
	982 Loader	400	98.352	408.384	1017.504	7.2	39.6	39.6	81835.2	8.784
	980 Loader	390	95.8932	398.1744	992.0664	7.02	38.61	38.61	79789.32	8.5644
Emissions Based On	**390 Excavator**	530	128.896	441.4688	1387.243	10.4728	50.5514	50.5514	114455.4	11.4798
Cycle Time	**Haul Truck**	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
Analysis/Throughput	**Haul Truck**	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Skid Steer	65	32.20295	95.9114	184.0547	1.443	17.1236	17.1236	13667.59	2.886
	Telehandler/Aerial Lift	63	26.1702	76.12794	157.7829	1.15227	12.71403	12.71403	11098.88	2.3436
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	102.1964	356.2363	1046.1	7.638	39.7176	39.7176	86813.36	9.1656
	Total Excavation Non-Haul Engines, Non-Dewater		618.8188	2326.649	6191.43	45.03487	252.3598	252.3598	498137.1	55.2762
	Total Haul Engines		308.712	1062.48	3215.712	23.712	120.384	120.384	259144.3	27.816
Permitted Emissions	**Recycle Generator Set**	1015	538.5387	2042.241	5694.84	38.3061	191.5305	191.5305	426849.4	48.0704

HP estimated based on CalEEMod App D for equipment that does not ha

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	52.6824	271.5826	513.3948	0.972	19.8288	18.2736	89823.45	28.9656
	982 Loader	400	38.016	220.2077	375.8933	0.72	13.968	12.96	67381.59	21.744
	980 Loader	390	37.0656	214.7025	366.4959	0.702	13.6188	12.636	65697.05	21.2004
Emissions Based On	**390 Excavator**	530	33.231	231.5657	325.978	1.007	11.2784	10.4728	94566.77	30.6128
Cycle Time	**Haul Truck**	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
Analysis/Throughput	**Haul Truck**	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Skid Steer	65	4.2809	78.80872	56.89941	0.12025	2.3088	2.14045	11351.06	3.67965
	Telehandler/Aerial Lift	63	2.12877	62.03197	34.05407	0.09765	0.64449	0.60543	9220.39	2.98809
	De-Watering Pump	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Emissions Based On	**De-Watering Pump**	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Fixed Operational Hours	**Water Truck**	402	34.371	204.3639	298.4274	0.7638	10.99872	10.08216	72491.04	23.37228
	Total Excavation Non-Haul Engines, Non-Dewater		201.7757	1283.263	1971.143	4.3827	72.64601	67.17044	410531.3	132.5628
	Total Haul Engines		133.608	882.4603	1216.599	2.28	48.336	44.688	215683.9	69.768
Permitted Emissions	**Recycle Generator Set**	1015	181.7662	812.6902	2709.969	3.7555	59.3369	59.3369	426850.1	15.7731

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	319.436	1301.185	3325.811	23.90025	127.7744	127.7744	261201.7	28.49645
	982 Loader	400	232.5337	965.5428	2405.686	17.02297	93.62633	93.62633	193483.1	20.76802
	980 Loader	390	226.7204	941.4042	2345.544	16.59739	91.28567	91.28567	188646	20.24882
Emissions Based On	**390 Excavator**	530	293.7127	1005.966	3161.083	23.86416	115.1904	115.1904	260807.2	26.15879
Cycle Time	**Haul Truck**	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
Analysis/Throughput	**Haul Truck**	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Skid Steer	65	44.42281	132.3063	253.8967	1.990566	23.62139	23.62139	18853.95	3.981133
	Telehandler/Aerial Lift	63	36.10085	105.0157	217.6558	1.589515	17.53855	17.53855	15310.5	3.232912
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	563.9052	1965.661	5772.231	42.14538	219.156	219.156	479023.5	50.57446
	Total Excavation Non-Haul Engines, Non-Dewater		1716.832	6417.08	17481.91	127.1102	688.1928	688.1928	1417326	153.4606
	Total Haul Engines		1438.567	4951.051	14984.9	110.4955	560.9774	560.9774	1207587	129.6198
Permitted Emissions	**Recycle Generator Set**	1015	237.4549	900.4741	2510.995	16.8901	84.45049	84.45049	188208.4	21.19542

HP estimated based on CalEEMod App D for equipment that does not ha

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	161.9242	834.7341	1577.966	2.987531	60.94563	56.16558	276080.6	89.02842
	982 Loader	400	116.8457	676.8285	1155.342	2.212986	42.93193	39.83375	207103.5	66.83217
	980 Loader	390	113.9245	659.9077	1126.459	2.157661	41.85863	38.8379	201925.9	65.16137
Emissions Based On	**390 Excavator**	530	98.43965	685.9633	965.6392	2.98302	33.40982	31.0234	280133.6	90.6838
Cycle Time	**Haul Truck**	600	404.6899	2672.915	3684.999	6.905972	146.4066	135.357	653292.5	211.3227
Analysis/Throughput	**Haul Truck**	600	404.6899	2672.915	3684.999	6.905972	146.4066	135.357	653292.5	211.3227
	Skid Steer	65	5.905347	108.7138	78.49069	0.165881	3.184906	2.952673	15658.37	5.075944
	Telehandler/Aerial Lift	63	2.936561	85.57086	46.97636	0.134705	0.889051	0.835169	12719.2	4.121962
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
Emissions Based On	**De-Watering Pump**	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
Fixed Operational Hours	**Water Truck**	402	189.6542	1127.65	1646.679	4.214538	60.68935	55.6319	399995.1	128.9649
	Total Excavation Non-Haul Engines, Non-Dewater		689.6301	4179.368	6597.553	14.85632	243.9093	225.2804	1393616	449.8685
	Total Haul Engines		809.3799	5345.83	7369.998	13.81194	292.8132	270.7141	1306585	422.6455
Permitted Emissions	**Recycle Generator Set**	1015	80.14518	358.335	1194.892	1.655892	26.16309	26.16309	188208.7	6.954747

HP estimated based on CalEEMod App D for equipment that does not ha

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	4.17007	16.98629	43.41673	0.312005	1.668028	1.668028	3409.851	0.372006
	982 Loader	400	3.035607	12.60466	31.40497	0.222226	1.222243	1.222243	2525.82	0.271116
	980 Loader	390	2.959716	12.28954	30.61985	0.21667	1.191687	1.191687	2462.675	0.264338
Emissions Based On	**390 Excavator**	530	3.978339	13.62581	42.81687	0.32324	1.560255	1.560255	3532.634	0.354321
Cycle Time	**Haul Truck**	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
Analysis/Throughput	**Haul Truck**	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Skid Steer	65	0.141991	0.422897	0.811542	0.006363	0.075502	0.075502	60.26376	0.012725
	Telehandler/Aerial Lift	63	0.115391	0.335667	0.695703	0.005081	0.056059	0.056059	48.93768	0.010334
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	3.154264	10.99513	32.28759	0.235745	1.225872	1.225872	2679.47	0.282894
	Total Excavation Non-Haul Engines, Non-Dewater		17.55538	67.25999	182.0533	1.321329	6.999646	6.999646	14719.65	1.567733
	Total Haul Engines		9.528308	32.79314	99.25204	0.731864	3.715618	3.715618	7998.417	0.858533
Permitted Emissions	**Recycle Generator Set**	1015	16.62184	63.03319	175.7696	1.182307	5.911535	5.911535	13174.59	1.483679

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	1.626027	8.382321	15.84579	0.030001	0.61201	0.564009	2772.375	0.894015
	982 Loader	400	1.173353	6.796648	11.60184	0.022223	0.431118	0.400007	2079.714	0.671122
	980 Loader	390	1.144019	6.626731	11.31179	0.021667	0.42034	0.390007	2027.721	0.654344
Emissions Based On	**390 Excavator**	530	1.025665	7.147209	10.06122	0.031081	0.348105	0.32324	2918.776	0.944855
Cycle Time	**Haul Truck**	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
Analysis/Throughput	**Haul Truck**	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
	Skid Steer	65	0.018876	0.347487	0.250883	0.00053	0.01018	0.009438	50.04959	0.016224
	Telehandler/Aerial Lift	63	0.009386	0.273514	0.150153	0.000431	0.002842	0.002669	40.65496	0.013175
	De-Watering Pump	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
Emissions Based On	**De-Watering Pump**	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
Fixed Operational Hours	**Water Truck**	402	1.060851	6.307633	9.210876	0.023574	0.339472	0.311183	2237.415	0.721379
	Total Excavation Non-Haul Engines, Non-Dewater		6.058178	35.88154	58.43255	0.129506	2.164068	2.000553	12126.71	3.915116
	Total Haul Engines		4.123773	27.23689	37.54998	0.070372	1.491877	1.379282	6657.022	2.15337
Permitted Emissions	**Recycle Generator Set**	1015	5.610162	25.08345	83.64242	0.115912	1.831417	1.831417	13174.61	0.486832

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.297862	1.213306	3.101195	0.022286	0.119145	0.119145	243.5608	0.026572
	982 Loader	400	0.216829	0.900333	2.243212	0.015873	0.087303	0.087303	180.4157	0.019365
	980 Loader	390	0.211408	0.877824	2.187132	0.015476	0.08512	0.08512	175.9053	0.018881
Emissions Based On	**390 Excavator**	530	0.284167	0.973272	3.058348	0.023089	0.111447	0.111447	252.331	0.025309
Cycle Time	**Haul Truck**	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
Analysis/Throughput	**Haul Truck**	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Skid Steer	65	0.070995	0.211448	0.405771	0.003181	0.037751	0.037751	30.13188	0.006363
	Telehandler/Aerial Lift	63	0.057695	0.167833	0.347852	0.00254	0.02803	0.02803	24.46884	0.005167
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	0.225305	0.785367	2.306257	0.016839	0.087562	0.087562	191.3907	0.020207
	Total Excavation Non-Haul Engines, Non-Dewater		1.364262	5.129384	13.64977	0.099285	0.556358	0.556358	1098.204	0.121863
	Total Haul Engines		0.680593	2.342367	7.089431	0.052276	0.265401	0.265401	571.3155	0.061324
Permitted Emissions	**Recycle Generator Set**	1015	1.187275	4.50237	12.55497	0.08445	0.422252	0.422252	941.0418	0.105977

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

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Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2020 Project Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	0.116145	0.598737	1.131842	0.002143	0.043715	0.040286	198.0268	0.063858
	982 Loader	400	0.083811	0.485475	0.828703	0.001587	0.030794	0.028572	148.551	0.047937
	980 Loader	390	0.081716	0.473338	0.807985	0.001548	0.030024	0.027858	144.8372	0.046739
	390 Excavator	530	0.073262	0.510515	0.718658	0.00222	0.024865	0.023089	208.484	0.06749
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Haul Truck	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	0.009438	0.173743	0.125442	0.000265	0.00509	0.004719	25.0248	0.008112
	Telehandler/Aerial Lift	63	0.004693	0.136757	0.075076	0.000215	0.001421	0.001335	20.32748	0.006588
	De-Watering Pump	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
	De-Watering Pump	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
	Water Truck	402	0.075775	0.450545	0.65792	0.001684	0.024248	0.022227	159.8154	0.051527
	Total Excavation Non-Haul Engines, Non-Dewater		0.444839	2.829111	4.345626	0.009662	0.160157	0.148085	905.0667	0.292251
	Total Haul Engines		0.294555	1.945492	2.682141	0.005027	0.106563	0.09852	475.5016	0.153812
Permitted Emissions	**Recycle Generator Set**	1015	0.400726	1.791675	5.974459	0.008279	0.130815	0.130815	941.0435	0.034774

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

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Max Year Emissions (Pre-mitigation)

Emissions Based On
Fixed Operational Hours
Permitted Emissions

Equipment	Approximate HP	Load Factor	Max Daily Opp-Hr
Backhoe	108	0.37	2
Water Truck	402	0.38	2
Reservoir Pump Generator Set	600	0.74	8

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truc

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipment is conservatively estimated bas

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based or

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	Project Operation		Annual Operating Hours	Avg Daily Operating Hours
			Max Annual Hp-Hr	Max Daily Hp-Hr		
Emissions Based On	**Backhoe**	108	25004	79.92	626	2
Fixed Operational Hours	**Water Truck**	402	15276	305.52	100	2
Permitted Emissions	**Reservoir Pump Generator Set**	600	259296	3552	584	

HP estimated based on CalEEMod App D for equipment that does not hk HP, which is based on Cat 772 or equivalent truck with 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipred on 2035 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment opa cycle time calculations and tonnage throughput

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	0.258	3.703	1.521	0.006	0.02	0.02	568.299	0.023
Fixed Operational Hours	**Water Truck**	402	0.208	1.105	0.348	0.005	0.013	0.013	568.299	0.018
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.11	0.978	0.328	0.005	0.011	0.011	568.299	0.009

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	6450.914	92588.12	38030.39	150.0213	500.0709	500.0709	14209488	575.0815
Fixed Operational Hours	**Water Truck**	402	3177.408	16879.98	5316.048	76.38	198.588	198.588	8681336	274.968
Permitted Emissions	**Reservoir Pump Generator Set**	600	28522.56	253591.5	85049.09	1296.48	2852.256	2852.256	1.47E+08	2333.664

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	20.61936	295.9438	121.5583	0.47952	1.5984	1.5984	45418.46	1.83816
Fixed Operational Hours	**Water Truck**	402	63.54816	337.5996	106.321	1.5276	3.97176	3.97176	173626.7	5.49936
Permitted Emissions	**Reservoir Pump Generator Set**	600	390.72	3473.856	1165.056	17.76	39.072	39.072	2018598	31.968

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	10.30968	147.9719	60.77916	0.23976	0.7992	0.7992	22709.23	0.91908
Fixed Operational Hours	**Water Truck**	402	31.77408	168.7998	53.16048	0.7638	1.98588	1.98588	86813.36	2.74968
Permitted Emissions	**Reservoir Pump Generator Set**	600	48.84	434.232	145.632	2.22	4.884	4.884	252324.8	3.996

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	14.22183	204.1219	83.84266	0.33074	1.102468	1.102468	31326.56	1.267838
Fixed Operational Hours	**Water Truck**	402	7.004986	37.21399	11.71988	0.168389	0.437812	0.437812	19139.07	0.606201
Permitted Emissions	**Reservoir Pump Generator Set**	600	62.88148	559.0735	187.5011	2.858249	6.288148	6.288148	324868	5.144848

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	0.045458	0.652444	0.26799	0.001057	0.003524	0.003524	100.1306	0.004052
Fixed Operational Hours	**Water Truck**	402	0.1401	0.74428	0.234398	0.003368	0.008756	0.008756	382.7814	0.012124
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.86139	7.658542	2.568509	0.039154	0.086139	0.086139	4450.247	0.070477

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

	Equipment	Approximate HP	2035 Project Emissions (lb/hr)								2035		
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	ROG	CO	NOX
Emissions Based On	**Backhoe**	108	0.022729	0.326222	0.133995	0.000529	0.001762	0.001762	50.06528	0.002026	0.007111	0.102061	0.041921
Fixed Operational Hours	**Water Truck**	402	0.07005	0.37214	0.117199	0.001684	0.004378	0.004378	191.3907	0.006062	0.003502	0.018607	0.00586
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.107674	0.957318	0.321064	0.004894	0.010767	0.010767	556.2809	0.00881	0.031441	0.279537	0.093751

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

Emissions Based On
Fixed Operational Hours
Permitted Emissions

Equipment	Approximate HP	Project Emissions (ton/yr) SO2	PM10	PM2.5	CO2	CH4
Backhoe	108	0.000165	0.000551	0.000551	15.66328	0.000634
Water Truck	402	8.42E-05	0.000219	0.000219	9.569534	0.000303
Reservoir Pump Generator Set	600	0.001429	0.003144	0.003144	162.434	0.002572

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipr

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Pre-mitigation)

Aggregates Fugitive Mining, Storage, and Sitewide Drop Emissions

Drops from stationary equipment (i.e., conveyors) are included in the plant emissions calculations.

Drop, Mining, and Storage Pile Emissions Factors

Material Drop Emission Factor from AP42 13.2.4:

PM10 E.F. (lb/ton) = $k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$

k = particle size multiplier =	0.35
U = mean wind speed[1] =	4.9
M = material moisture content =	3
PM10 EF (lb/ton) =	0.00062
PM2.5 EF[2] (lb/ton) =	0.00018

Bulldozing Emission Factor, CalEEMod User Manual, Appendix A:

EF PM10 (lb/hr) = 1.0 * s^1.5 / 7.9 * 0.75 =	0.67	
EF PM2.5 (lb/hr) = 5.7 * s^1.2 / 7.9 * 0.105 =	0.09	
s (silt, %) =	6.9	
Watering C.E. =	61%	water every 3 hours if material is not already wet
days of rain =	51	

Quarry Operation Fugitive Emissions:

lbs PM10 / Ton Quarried[3] =	0.021
lbs PM2.5/lbs PM10 =	0.292

Storage Pile Emissions Controlled Factor from SSP1610 - Aggregate Processing:

lb PM10/acre/day 1.054

	Area (acres)	lbs PM10/hr	lbs PM10/day	lbs PM10/yr
Baseline Storage	2	0.1	2.1	769.4
Project Storage	2	0.1	2.1	769.4

Notes:

[1] Mean wind speed based on data for Tulare in Table 1 of CalEEMod User Manual Appendix D which states 2.2 m/s (equvalent to 4.921 mph).

[2] PM2.5 emission factor assumed to be 29.2% of PM10 for material drops based on SCAQMD's *Updated CEIDARS Table with PM2.5 Fractions for mineral products - loading*

[3] Emission Factor from San Diego Air Pollution Control District, *Quarry Operations, General* (https://bit.ly/2XXNWUl)

Drop and Mining Emissions - Baseline

	Throughput			PM10 Emissions			PM2.5 Emissions		
Activity	Peak Hour (tph)	Peak Day (tpd)	Peak Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	650	4,000	500,000	0.4	2	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Plant	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Export Trucks	650	4,000	500,000	0.4	2	311	0.1	1	91

Drop and Mining Emissions - Project

	Throughput			PM10 Emissions			PM2.5 Emissions		
Activity	Peak Hour (tph)	Peak Day (tpd)	Peak Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)
Excavation Process	1,000	6,000	928,571	21	126	19,500	6	37	5,694
Excavation to Haul Truck/Conveyor	700	7,000	650,000	0.4	4	404	0.1	1	118
Haul Truck/Conveyor to Plant Feed Pile	700	7,000	650,000	0.4	4	404	0.1	1	118
Slurry Wall Construction	192	1,538	468,450	0.1	1	291	0.0	0.3	85
Loader to Plant	700	7,000	650,000	0.4	4	404	0.1	1	118
Loader to Export Trucks	700	7,000	650,000	0.4	4	404	0.1	1	118

Max Year Emissions (Pre-mitigation)

Recycle Plant - Baseline

	Basline Factor PM10 Emissions (lbs/ton)	0.002367
	Basline Factor PM2.5 Emissions (lbs/ton)	0.000691
	Total PM10 Emissions, lb/hr	1.1834
	Total PM2.5 Emissions, lb/hr	0.35

	Max (ton/hr)
Processing	500

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	500	9	*Truck Unloading Stone*	0.000016	0.0080
3	Hopper	Conveyor 1	0	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
4	Conveyor 1	Jaw Crusher	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
5	Jaw Crusher	Conveyor 2	215	500	2	*Primary Crushing*	0.000540	0.2700
6	Conveyor 2	Screen 1	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
7	Screen 1	Conveyor 3, 4, 5	60	500	1	*Screening*	0.000740	0.3700
8	Conveyor 3	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
9	Conveyor 4	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
10	Conveyor 5	Conveyor 6	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
11	Conveyor 6	Cone Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
12	Cone Crusher	Conveyor 7, 8	200	350	3	*Secondary Crushing*	0.000540	0.1890
13	Conveyor 7	Conveyor 9	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
14	Conveyor 8	Screen 2	200	263	7	*Conv. Transfer Pt.*	0.000046	0.0121
15	Conveyor 9	Pile	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
16	Screen 2	Conveyor 10, 11, 12	60	263	1	*Screening*	0.000740	0.1943
17	Conveyor 10	Conveyor 13	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
18	Conveyor 11	Conveyor 14	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
19	Conveyor 12	Conveyor 15	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
20	Conveyor 13	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
21	Conveyor 14	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
22	Conveyor 15	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Description	PM 10 No Contro	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drilling	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Max Year Emissions (Pre-mitigation)

Recycle Plant - Project

	Max (ton/hr)
Processing	500

Project Factor PM10 Emissions (lbs/ton)	0.002367
Project Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	1.1834
Total PM2.5 Emissions, lb/hr	0.35

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	500	9	*Truck Unloading Stone*	0.000016	0.0080
3	Hopper	Conveyor 1	0	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
4	Conveyor 1	Jaw Crusher	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
5	Jaw Crusher	Conveyor 2	215	500	2	*Primary Crushing*	0.000540	0.2700
6	Conveyor 2	Screen 1	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
7	Screen 1	Conveyor 3, 4, 5	60	500	1	*Screening*	0.000740	0.3700
8	Conveyor 3	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
9	Conveyor 4	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
10	Conveyor 5	Conveyor 6	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
11	Conveyor 6	Cone Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
12	Cone Crusher	Conveyor 7, 8	200	350	3	*Secondary Crushing*	0.000540	0.1890
13	Conveyor 7	Conveyor 9	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
14	Conveyor 8	Screen 2	200	263	7	*Conv. Transfer Pt.*	0.000046	0.0121
15	Conveyor 9	Pile	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
16	Screen 2	Conveyor 10, 11, 12	60	263	1	*Screening*	0.000740	0.1943
17	Conveyor 10	Conveyor 13	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
18	Conveyor 11	Conveyor 14	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
19	Conveyor 12	Conveyor 15	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
20	Conveyor 13	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
21	Conveyor 14	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
22	Conveyor 15	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Max Year Emissions (Pre-mitigation)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000108
Basline Factor PM2.5 Emissions (lbs/ton)	0.000031536
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	650

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Descriptio	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drillin	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Max Year Emissions (Pre-mitigation)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000100286
Basline Factor PM2.5 Emissions (lbs/ton)	2.92834E-05
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	700

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Max Year Emissions (Pre-mitigation)

Truck Loading and Maneuvering	Baseline	Project		
Excavator Production Rate	691	691	tons/hour	4.3 cy bucket cycle time analysis
Truck payload	50	50	tons	
Time to load a truck	4.3	4.3	minutes	Calculation
Time to maneuver	0.8	0.8	minutes	Caterpillar Handbook (44 ed.)
Total time load and maneuver	5.1	5.1	minutes	Calculation
Haul Road Length	0.3	0.6	miles	Assumes avg. trip to be half of site length/longest path
Truck Haul Avg Speed	30.0	30.0	mph	
Haul Time	0.6	1.2	minutes	
Total Time Per Load	5.7	6.3	minutes	
Material transported by Truck	100%	100%	Percent of total material	
VMT/Ton Transferred	0.012	0.024		
Operating Hour/Ton Transferred	0.0038	0.0042		
Vehicle HP	600	600		
HP-HR/Ton Transferred	2.30	2.54		
lb PM10 Ems/Ton Transferred	0.025	0.049	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM2.5 Ems/Ton Transferred	0.005	0.010	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM10 Ems/Ton Processed	0.025	0.049	Takes into account percent of total material transported by truck	
lb PM2.5 Ems/Ton Processed	0.005	0.010	Takes into account percent of total material transported by truck	
Annual Rainfall Reduction Factor	0.860273973	0.860274		

Max Year Emissions (Pre-mitigation)

Basline Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
Control efficiency for unpaved roads in baseline is 80% for watering.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Basline Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2
Control efficiency for unpaved roads in baseline is 80% for watering.

Future Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Future Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2

Max Year Emissions (Pre-mitigation)

Source: EMFAC2021 (v1.0.0) Emission Rates
Region Type: Sub-Area
Region: Tuolumne (MC)
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, g/mile for RUNEX, PMBW and PMTW, mph for Speed

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Total VMT	CVMT	EVMT	NOx_RUNEX
Tuolumne (MC)	2021	T7 Tractor Class 8	2021	15	Diesel	0.051113349	0.051113349	0	2.951511768

PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	SOx_RUNEX	NH3_RUNEX	PM10_PMBW	PM2.5_PMBW
0.003375524	0.00352815	1891.421977	0.000909605	0.297994303	0.019583553	0.022294384	0.2189903	0.017910635	0.22	0.135264231	0.047342481

	Excavation Activity				Excavation Emissions (lbs)									
	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	25	26000	41600	1.79605	20.08410	270.68994	1.64263	0.32357	0.30958	173466.66179	0.08342	128.25987	27.19109
On-Road Truck Emissions Daily	1.6	25	280	448	0.01934	0.21629	2.91512	0.01769	0.00348	0.00333	1868.10251	0.00090	1.38126	0.29283
On-Road Truck Emissions Hourly	1.6	25	28	44.8	0.00193	0.02163	0.29151	0.00177	0.00035	0.00033	186.81025	0.00009	0.13813	0.02928

	Operation Activity				Operation Emissions (lbs)									
	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	N/A	N/A	2530	0.10923	1.22146	16.46263	0.09990	0.01968	0.01883	10549.77534	0.00507	7.80042	1.65369
On-Road Truck Emissions Daily	1.6	N/A	N/A	50.6	0.00218	0.02443	0.32925	0.00200	0.00039	0.00038	210.99551	0.00010	0.15601	0.03307
On-Road Truck Emissions Hourly	1.6	N/A	N/A	10	0.00043	0.00483	0.06507	0.00039	0.00008	0.00007	41.69872	0.00002	0.03083	0.00654

Off-Road Emissions Emissions Calculations - Cycle Time Analyses

Assumptions

Parameters	Truck Loading
Loader Model	980H Loader
Travel Distance (avg) (meters)	15
Bucket Payload[1] (yd^3)	7.00
Bucket Payload in Tons	10.5
Material Type[2]	Uniform Agg > 1"
Bucket Fill Factor[2]	85%
Job Efficiency[3] (work 50 min/hr)	83%
Grade Resistance[4]	0%
Rolling Resistance[4]	3%
Total Resistance[4]	3%

Cycle Time (mins)

Hydraulic Cycle Time [5]	Truck Loading	
Average Cycle Time [6]		0.65
Material Handler?	Yes	-0.05
Materials:	3/4" to 6"	0.00
Pile:	Conveyor piled >10'	0.00
Truck Ownership:	Common	-0.04
Operation Cycle:	Constant	-0.04
Target Type:	N/A	0.00
Total Hydraulic Cycle Time		**0.52**

Total Cycle Time (mins)	Truck Loading
Hydraulic Cycle Time (min/cycle)	0.52
Travel with load[7] (min/cycle)	0.08
Travel empty[7] (min/cycle)	0.07
Total Cycle Time (min/cycle)	**0.67**

Rate Calculations

Production Calculations	Truck Loading
Cycles per Hour	74.6
Production Rate (tph)	666

[1] Bucket payload ranges based on activity type and equipment size. In this case, heaped bucket capacity for the 980H is equal to the bucket capacity of a 988 that is equipped for digging. Thus, all three loaders (980, 982, 988) have similar e

[2] Material type and bucket fill factor from Caterpillar Performance Handbook Edition 41, January 2011

[3] Job efficiency accounts for operator skill, minor repairs and adjustments, personnel delays, and delays caused by job l CPH suggested 50 minutes (83%) (CPH page 12-80)

[4] Resisitance from CPH pg 22-5 and 22-6 and "Typical Rolling Resistance Factors" table on page 27-1

[5] Guidelines for "Selecting a Machine" on page 12-79 and 12-80 of CPH were used to determine the hydraulic cycle time

[6] Average cycle time for this type of equipment is tabulated on page 12-80 of CPH.

[7] Figures on pages 12-149 through 12-156 in the CPH were used to estimate the travel times for theloaders.

Excavator Cycle Time Analysis

Assumptions

Excavator Bucket Size =	4.3	yd^3
Material Type =	Sand and Gravel	
Sand and Gravel density =	1.5	$tons/yd^3$

Cycle Time

From the Caterpillar Performance Handbook, Edition 41 (2011)
page 4-183 "Cycle Time Estimating Chart"
Based on the low end of the typical range due to the loose configuration of material to be moved.

Cycle Time =	0.28	minutes

Production Estimate

Production Rate =	691	yd^3/hour
Production Rate =	1037	tons/hour
Job Efficiency* =	67%	
Production Rate =	691	tons/hour

* Job efficiency is estimated to be 40 minutes per hour to account for operator skill, minor delays, and periodic excavator transportation

	Baseline Tonnage		Project Tonnage		Recycle Plant Tonnage - Baseline and Excavation
	Gross	Net	Gross	Net	
Annual	714,286	500,000	928,571	650,000	100,000
Daily	6,000	4,000	6,000	7,000	2,600
Houlry	1,000	650	1,000	700	500

Max Year Emissions (Mitigated)

		Baseline (lbs/year) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									236.68	69.11	236.68	69.11	0
	Recycle Engine	237.45	900.47	2,510.99	16.89	84.45	84	188,208.36	21.20			84.45	84.45	188,801.83
	Aggregates Plant Fugitive Ems.									54	16	54.00	15.77	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									15,000	4,380	15,000	4,380	0
	Offroad Engines	1,717	6,417	17,482	127	688	688	1,417,326	153			688	688	1,421,623
	Aggregates Transfer/Drops									1,244	363	1,244	363	0
	Off-Road Vehicle Haul	1,439	4,951	14,985	110	561	561	1,207,587	130	10,631	2,254	11,192	2,815	1,211,216
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**3,393**	**12,269**	**34,978**	**254**	**1,334**	**1,334**	**2,813,121**	**304**	**27,935**	**7,306**	**29,268**	**8,640**	**2,821,641**

		Baseline (lbs/day) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6.15	1.80	6.15	1.80	0.00
	Recycle Engine	16.62	63.03	175.77	1.18	5.91	6	13,174.59	1.48			5.91	5.91	13,216.13
	Aggregates Plant Fugitive Ems.									0.43	0.13	0.43	0.13	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Offroad Engines	17.6	67.3	182.1	1.3	7.0	7.0	14,719.7	1.6			7.00	7.00	14,764
	Aggregates Transfer/Drops									10	3	9.95	2.91	0
	Off-Road Vehicle Haul Emissions	10	33	99	1	4	4	7,998	1	99	21	102.57	24.67	8,022
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**44**	**163**	**457**	**3**	**17**	**17**	**35,893**	**4**	**244**	**63**	**260**	**80**	**36,002**

		Baseline (lbs/hr) Seaborn Site												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1.18	0.35	1.18	0.35	0.00
	Recycle Engine	1.19	4.50	12.55	0.08	0.42	0.42	941.04	0.11			0.42	0.42	944.01
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Offroad Engines	1.4	5.1	13.6	0.1	0.6	0.6	1,098.2	0.1			0.56	0.56	1,102
	Aggregates Transfer/Drops									2	0	1.62	0.47	0
	Off-Road Vehicle Haul Emissions	1	2	7	0.1	0.3	0.3	571	0.06	16	3	16.33	3.67	573
	De-watering Pumps													
	On-Road Vehicles													
	Slurry Wall Construction													
	Total Emissions	**3**	**12**	**33**	**0.2**	**1**	**1**	**2,611**	**0**	**40**	**10**	**41**	**12**	**2,619**

*CO2e Calculated based on IPCC Fifth Assessment Report (AR5)
Assumes GWP factor of: 28 for Methane

Max Year Emissions (Mitigated)

		Years 1 - 20 (lbs/year) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									237	69	236.68	69.11	0.00
	Recycle Engine	80	358	1,195	2	26	26	188,209	7			26.16	26.16	188,403.42
	Aggregates Plant Fugitive Ems.									65	19	65.19	19.03	0
	Aggregates Storage									769	225	769.42	224.67	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									19,500	5,694	19,500.00	5,694.00	0
	Offroad Engines	690	4,179	6,598	15	244	225	1,393,616	450			243.91	225.28	1,406,213
	Aggregates Transfer/Drops									1,617	6,166	1,616.86	6,166.12	0
	Off-Road Vehicle Haul	809	5,346	7,370	14	293	271	1,306,585	422.65	17,236	3,654	17,528	3,925	1,318,419
	De-watering Pumps	277	1,542	1,517	3	76	76	208,844	24.99			75.70	75.70	209,543
	On-Road Vehicles	2	20	271	2	0.32	0.3	173,467	0.08	55.17	11.70	55.49	12.01	173,469
	Slurry Wall Construction	673	4674	6518	14	265	251	1340543	360	291	85	556.79	336.25	1,350,617
	Total Emissions	**2,531**	**16,120**	**23,468**	**49**	**904**	**849**	**4,611,263**	**1,264**	**39,770**	**15,924**	**40,675**	**16,773**	**4,646,664**

		Years 1 - 20 (lbs/day) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									6	2	6.15	1.80	0.00
	Recycle Engine	5.6	25.1	83.6	0.1	1.8	1.8	13,174.6	0.5			1.83	1.83	13,188.24
	Aggregates Plant Fugitive Ems.									1	0	0.70	0.20	0
	Aggregates Storage									2	1	2.11	0.62	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									126	37	126.00	36.79	0
	Offroad Engines	6.1	35.9	58.4	0.1	2.2	2.0	12,126.7	3.9			2.16	2.00	12,236
	Aggregates Transfer/Drops									17	42	17.41	41.88	0
	Off-Road Vehicle Haul Emissions	4	27	38	0.1	1	1	6,657	2.15	183.68	38.94	185.17	40.32	6,717
	De-watering Pumps	1.8	9.9	9.7	0.02	0.5	0.5	1,335	0.16			0.48	0.48	1,340
	On-Road Vehicles	0.02	0.2	2.9	0.02	0.0	0.003	1,868	0.001	0.69	0.15	0.69	0.15	1868.127667
	Slurry Wall Construction	2.9	20.3	28.5	0.1	1.3	1.2	5105.2	1.4	1	0.3	2.22	1.46	5143.95939
	Total Emissions	**20**	**119**	**221**	**0.40**	**7**	**7**	**40,267**	**8**	**338**	**121**	**345**	**128**	**40,494**

		Years 1 - 20 (lbs/hr) Mckay Excavation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.									1	0.3	1.18	0.35	0.00
	Recycle Engine	0.40	1.79	5.97	0.01	0.13	0.13	941.04	0.03			0.13	0.13	942.02
	Aggregates Plant Fugitive Ems.									0.07	0.02	0.07	0.02	0
	Aggregates Storage									0	0	0.09	0.03	0
	Reservoir Operation Pumps													
Permit Exempt Sources	Excavation Fugitive Ems.									21	6	21.00	6.13	0
	Offroad Engines	0.4	2.8	4.3	0.0	0.2	0.1	905.1	0.3			0.16	0.15	913
	Aggregates Transfer/Drops									1.7	6.6	1.74	6.64	0
	Off-Road Vehicle Haul Emissions	0	2	3	0	0	0	476	0.15	18.63	3.95	18.74	4.05	480
	De-watering Pumps	0.07	0.41	0.40	0.001	0.02	0.02	55.63	0.01			0.02	0.02	56
	On-Road Vehicles	0.00	0.02	0.29	0.002	0.00035	0.00	186.81	0.00	0.07	0.01	0.07	0.01	186.8
	Slurry Wall Construction	0.43	3.01	4.19	0.01	0.19	0.18	752.45	0.20	0.12	0.03	0.31	0.21	758.0
	Total Emissions	**2**	**10**	**18**	**0.03**	**1**	**1**	**3,317**	**1**	**43**	**17**	**44**	**18**	**3,336**

Max Year Emissions (Mitigated)

		Years 21 - 50 (lbs/year) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	62.88	559.07	187.50	3	6.29	6	324,868.025	5.145			6.29	6.29	325,012
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	21	241	96	0.5	1.5	2	50,466	2			1.54	1.54	50,518
	Aggregates Transfer/Drops											0.00	0.00	0
	Off-Road Vehicle Haul													
	De-watering Pumps													
	On-Road Vehicles	0.1	1	16	0.1	0.02	0.02	10,550	0.01	3.90	0.83	3.92	0.85	10549.92
	Slurry Wall Construction													
	Total Emissions	**84**	**802**	**300**	**3**	**8**	**8**	**385,883**	**7**	**4**	**1**	**12**	**9**	**386,080**

		Years 21 - 50 (lbs/day) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	0.86	7.66	2.57	0.04	0.09	0.1	4,450.247	0.070			0.09	0.09	4,452
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	0.2	1	1	0.004	0.01	0.01	483	0.02			0.01	0.01	483
	Aggregates Transfer/Drops													
	Off-Road Vehicle Haul Emissions													
	De-watering Pumps													
	On-Road Vehicles	0.002	0.02	0.3	0.002	0.0004	0.0004	211	0.0001	0.08	0.02	0.08	0.02	210.9983
	Slurry Wall Construction													
	Total Emissions	**1**	**9**	**3**	**0.05**	**0.1**	**0.1**	**5,144**	**0.1**	**0.1**	**0.0**	**0.2**	**0.12**	**5,147**

		Years 21 - 50 (lbs/hr) Reservior Operation												
		ROG	CO	NOX	SO2	PM10 (diesel)	PM2.5 (diesel)	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive	PM10 Total	PM2.5 Total	CO2e
Stationary Sources	Recycle Plant Fugitive Ems.													
	Recycle Engine													
	Aggregates Plant Fugitive Ems.													
	Aggregates Storage													
	Reservoir Operation Pumps	0.11	0.96	0.32	0.005	0.01	0.01	556.281	0.009			0.01	0.01	557
Permit Exempt Sources	Excavation Fugitive Ems.													
	Offroad Engines	0.1	1	0.3	0.002	0.006	0.006	241	0.01			0.01	0.01	242
	Aggregates Transfer/Drops													
	Off-Road Vehicle Haul Emissions													
	De-watering Pumps													
	On-Road Vehicles	0.0004	0.005	0.07	0.0004	0.0001	0.0001	41.7	0.0000	0.02	0.003	0.02	0.00	41.69928
	Slurry Wall Construction													
	Total Emissions	**0.2**	**2**	**1**	**0.01**	**0.02**	**0.02**	**839**	**0.02**	**0.02**	**0.00**	**0.03**	**0.02**	**840**

Max Year Emissions (Mitigated)

Road Based Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	2.10E-05
7440393	Barium	1.45E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	2.50E-05
18540299	Hexavalent Chromium	1.25E-06
7440508	Copper	4.00E-05
7439921	Lead	3.00E-05
7439965	Manganese	4.90E-04
7440020	Nickel	1.90E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	1.12E-04

From SDACPD "H03 - Haul Roads, Mineral Industry Sites..."
https://bit.ly/39VKJKC
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Quarrying Fugitive Emissions		
7440382	Arsenic	2.0E-05
7440417	Beryllium	0.000001
7440439	Cadmium	0.000001
7440473	Chromium	5.00E-05
18540299	Haxavalent Chromium	2.50E-06
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	2.00E-04

From SDACPD " Q01 - Quarry Operations, General..."
https://bit.ly/3oeslls

Aggregates Processing Fugative Emissions		
7429905	Aluminum	1.50E-02
7440382	Arsenic	1.00E-06
7440393	Barium	2.25E-04
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
18540299	Hexavalent Chromium	1.40E-06
7440473	Chromium	2.80E-05
7440484	Cobalt	1.10E-05
7440508	Copper	3.70E-05
7439921	Lead	5.00E-05
7439965	Manganese	5.30E-04
7440020	Nickel	2.80E-05
7782492	Selenium	1.00E-06
1175	Silica, Crystalline	1.00E-01
7440666	Zinc	9.90E-05

From SDACPD "T01 - Transfer Point, Process Material..."
(same speciation as S01 for Screening and C01 for Crushing)
https://bit.ly/2Y9f5E7
*Hexavalent Chromium included at 5% of chromium per SJVAPCD standard

Storage Fugitive Emissions - SJAPCD Prof. ID 207		
7440382	Arsenic	2.00E-05
7440417	Beryllium	1.00E-06
7440439	Cadmium	1.00E-06
7440473	Chromium	5.00E-05
18540299	Hexavalent Chromium	2.50E-07
7440508	Copper	1.00E-04
7439921	Lead	5.00E-05
7439965	Manganese	5.00E-04
7440020	Nickel	2.00E-05
7782492	Selenium	5.00E-06
7440666	Zinc	2.00E-04

From SJVAPCD Document, "AB2588 'Hots Spots' Air Toxics Profiles"
March 27, 2017

Max Year Emissions (Mitigated)

Description	Equipment	Load Factor	HP	Cubic Yards
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.43	165	N/A
Slurry Wall Excavation	Excavator	0.38	429	109,000
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.38	300	119,000
Plug Mill for Sieving Native Soils	Generator	0.74	100	N/A
Mixing and Moving Slurry Mix	Loader	0.36	349	119,000
Construction Slurry Pump	Generator	0.74	84	N/A
Dust Control	Water Truck	0.38	230	N/A

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Mitigated)

Description	Equipment	Daily Operating hours	Operating Days	Annual HP-HR	Daily HP-HR	Houlry HP-HR	Annual Tons Material Handled*	Daily Tons Material Handled*	Hourly Tons Material Handled*
Clear/Grub, Haul Road, Construction Ponds	Dozer	8	4	2270.4	567.6	70.95			
Slurry Wall Excavation	Excavator	8	321	418635.36	1304.16	163.02	147150	458	57
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	8	372	339264	912	114	160650	432	54
Plug Mill for Sieving Native Soils	Generator	4	201	59496	296	74			
Mixing and Moving Slurry Mix	Loader	8	248	249269.76	1005.12	125.64	160650	647.8	81.0
Construction Slurry Pump	Generator	8	321	159626.88	497.28	62.16			
Dust Control	Water Truck	2	100	17480	174.8	87.4			

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Mitigated)

Description	Equipment	2020 Project Emissions Factor (g/hp-hr)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	0.476	3.33989	4.87226	0.005	0.272	0.25	471.015	0.152
Slurry Wall Excavation	Excavator	0.153	1.1016	1.57199	0.005	0.052	0.048	470.2956	0.152
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	0.246	1.41417	2.34677	0.005	0.086	0.079	474.5787	0.153
Plug Mill for Sieving Native Soils	Generator	0.364	3.38	3.173	0.006	0.179	0.179	568.299	0.032
Mixing and Moving Slurry Mix	Loader	0.289	1.6304	3.01666	0.005	0.112	0.103	466.7831	0.151
Construction Slurry Pump	Generator	0.364	3.38	3.173	0.006	0.179	0.179	568.299	0.032
Dust Control	Water Truck	0.275	1.39106	2.50726	0.005	0.098	0.09	470.1675	0.152

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Mitigated)

Description	Equipment	2020 Project Emissions (g/year)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	1081	7583	11062	11	618	568	1069392	345
Slurry Wall Excavation	Excavator	64051	461169	658091	2093	21769	20094	196882368	63633
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	83459	479777	796175	1696	29177	26802	161007468	51907
Plug Mill for Sieving Native Soils	Generator	21657	201096	188781	357	10650	10650	33811517	1904
Mixing and Moving Slurry Mix	Loader	72039	406409	751962	1246	27918	25675	116354911	37640
Construction Slurry Pump	Generator	58104	539539	506496	958	28573	28573	90715796	5108
Dust Control	Water Truck	4807	24316	43827	87	1713	1573	8218528	2657

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Mitigated)

Description	Equipment	2020 Project Emissions (g/day)							
		ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Clear/Grub, Haul Road, Construction Ponds	Dozer	270	1896	2765	3	154	142	267348	86
Slurry Wall Excavation	Excavator	200	1437	2050	7	68	63	613341	198
Haul Excavated Soil and Slurry Mix Haul	Dump Truck	224	1290	2140	5	78	72	432816	140
Plug Mill for Sieving Native Soils	Generator	108	1000	939	2	53	53	168217	9
Mixing and Moving Slurry Mix	Loader	290	1639	3032	5	113	104	469173	152
Construction Slurry Pump	Generator	181	1681	1578	3	89	89	282604	16
Dust Control	Water Truck	48	243	438	1	17	16	82185	27

*Assumes density of soil/gravel of 100 lb/cubic foot per AP-42 Appendix A

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	Opp-Hour/Ton Processed	Load Factor	Hp-Hr/Ton Processed	Max Daily Opp-Hr
	988 Loader	540	0.001501	0.36	0.29	14
	982 Loader	400	0.001501	0.36	0.22	14
	980 Loader	390	0.001501	0.36	0.21	14
Emissions Based On	**390 Excavator**	530	0.001447	0.38	0.29	14
Cycle Time	**Haul Truck**	600	0.004227	0.38	0.96	14
Analysis/Throughput	**Haul Truck**	600	0.004227	0.38	0.96	14
	Skid Steer	65	N/A*	0.37	N/A	2
	Telehandler/Aerial Lift	63	N/A*	0.31	N/A	2
	De-Watering Pump	30	N/A*	0.74	N/A	24
Emissions Based On	**De-Watering Pump**	30	N/A*	0.74	N/A	24
Fixed Operational Hours	**Water Truck**	402	N/A*	0.38	N/A	14
	Total Excavation Non-Haul Engines, Non-Dewater					
	Total Haul Engines					
Permitted Emissions	**Recycle Generator Set**	1015	0.002	0.74	1.50	14

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truck HP, which is based on Cat 772 or equivalent truck v

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is conservatively estimated based on the 2005 emission year (App D Table 3.4)

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conservatively estimated based on 2020 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based on cycle time calculations and tonnage throughput

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	Project Excavation		Baseline		Annual Operating Hours	Avg Daily Operating Hours
			Max Annual Hp-Hr	Max Daily Hp-Hr	Max Annual Hp-Hr	Max Daily Hp-Hr		
	988 Loader	540	271024	2721.6	208480	2721.6	502	1.60
	982 Loader	400	200759	2016	154430	2016	502	1.60
	980 Loader	390	195740	1965.6	150569	1965.6	502	1.60
Emissions Based On	**390 Excavator**	530	270615	2819.6	208165	2819.6	511	1.63
Cycle Time	**Haul Truck**	600	626499	3192	481922	3192	1044	3.34
Analysis/Throughput	**Haul Truck**	600	626499	3192	481922	3192	1044	3.34
	Skid Steer	65	15048	48.1	15048	48.1	626	2
	Telehandler/Aerial Lift	63	12220	39.06	12220	39.06	626	2
	De-Watering Pump	30	83345	532.8	0	0	3754	12
Emissions Based On	**De-Watering Pump**	30	83345	532.8	0	0	3754	12
Fixed Operational Hours	**Water Truck**	402	382336	2138.64	382336	2138.64	2503	8
	Total Excavation Non-Haul Engines, Non-Dewater							
	Total Haul Engines							
Permitted Emissions	**Recycle Generator Set**	1015	150220	10515.4	150220	10515.4	148	0.47

HP estimated based on CalEEMod App D for equipment that does not hwith 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.695	2.831	7.236	0.052	0.278	0.278	568.299	0.062
	982 Loader	400	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
	980 Loader	390	0.683	2.836	7.066	0.05	0.275	0.275	568.3	0.061
Emissions Based On	**390 Excavator**	530	0.64	2.192	6.888	0.052	0.251	0.251	568.299	0.057
Cycle Time	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
Analysis/Throughput	**Haul Truck**	600	0.677	2.33	7.052	0.052	0.264	0.264	568.299	0.061
	Skid Steer	65	1.339	3.988	7.653	0.06	0.712	0.712	568.299	0.12
	Telehandler/Aerial Lift	63	1.34	3.898	8.079	0.059	0.651	0.651	568.299	0.12
	De-Watering Pump	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Emissions Based On	**De-Watering Pump**	30	2.76	6.203	6.155	0.066	0.664	0.664	568.299	0.249
Fixed Operational Hours	**Water Truck**	402	0.669	2.332	6.848	0.05	0.26	0.26	568.299	0.06
	Total Excavation Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.717	2.719	7.582	0.051	0.255	0.255	568.299	0.064

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.271	1.39703	2.64092	0.005	0.102	0.094	462.0548	0.149
	982 Loader	400	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
	980 Loader	390	0.264	1.52922	2.61037	0.005	0.097	0.09	467.9277	0.151
Emissions Based On	**390 Excavator**	530	0.165	1.14978	1.61856	0.005	0.056	0.052	469.547	0.152
Cycle Time	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
Analysis/Throughput	**Haul Truck**	600	0.293	1.93522	2.66798	0.005	0.106	0.098	472.991	0.153
	Skid Steer	65	0.178	3.27687	2.36588	0.005	0.096	0.089	471.9774	0.153
	Telehandler/Aerial Lift	63	0.109	3.17624	1.74368	0.005	0.033	0.031	472.1142	0.153
	De-Watering Pump	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Emissions Based On	**De-Watering Pump**	30	0.755	4.197	4.128	0.007	0.206	0.206	568.299	0.068
Fixed Operational Hours	**Water Truck**	402	0.225	1.33781	1.95357	0.005	0.072	0.066	474.542	0.153
	Total Excavation Non-Haul Engines, Non-Dewater									
	Total Haul Engines									
Permitted Emissions	**Recycle Generator Set**	1015	0.242	1.082	3.608	0.005	0.079	0.079	568.3	0.021

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	144893.7	590207.4	1508563	10840.97	57957.49	57957.49	1.18E+08	12925.77
	982 Loader	400	105475.5	437962.8	1091201	7721.489	42468.19	42468.19	87762439	9420.216
	980 Loader	390	102838.6	427013.8	1063921	7528.451	41406.48	41406.48	85568378	9184.711
Emissions Based On	**390 Excavator**	530	133225.8	456298.5	1433843	10824.6	52249.51	52249.51	1.18E+08	11865.43
Cycle Time	**Haul Truck**	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
Analysis/Throughput	**Haul Truck**	600	326261.5	1122879	3398517	25059.97	127227.5	127227.5	2.74E+08	29397.27
	Skid Steer	65	20149.85	60013.13	115165.6	902.9057	10714.48	10714.48	8552007	1805.811
	Telehandler/Aerial Lift	63	16375.07	47634.34	98727	720.9918	7955.35	7955.35	6944727	1466.424
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	255783.1	891608.6	2618240	19116.82	99407.48	99407.48	2.17E+08	22940.19
	Total Excavation Non-Haul Engines, Non-Dewater		778741.8	2910739	7929660	57656.23	312159	312159	6.43E+08	69608.55
	Total Haul Engines		652523	2245759	6797035	50119.94	254455.1	254455.1	5.48E+08	58794.54
Permitted Emissions	**Recycle Generator Set**	1015	107707.7	408448.2	1138968	7661.22	38306.1	38306.1	85369876	9614.08

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	73447.57	378629	715753.4	1355.121	27644.47	25476.28	1.25E+08	40382.61
	982 Loader	400	53000.3	307004.2	524054.5	1003.794	19473.59	18068.28	93940558	30314.56
	980 Loader	390	51675.29	299329.1	510953.1	978.6987	18986.75	17616.58	91592044	29556.7
Emissions Based On	**390 Excavator**	530	44651.47	311147.7	438006.6	1353.075	15154.44	14071.98	1.27E+08	41133.48
Cycle Time	**Haul Truck**	600	183564.3	1212414	1671487	3132.496	66408.92	61396.92	2.96E+08	95854.38
Analysis/Throughput	**Haul Truck**	600	183564.3	1212414	1671487	3132.496	66408.92	61396.92	2.96E+08	95854.38
	Skid Steer	65	2678.62	49311.74	35602.78	75.24214	1444.649	1339.31	7102518	2302.41
	Telehandler/Aerial Lift	63	1332.002	38814.29	21308.12	61.101	403.2666	378.8262	5769330	1869.691
	De-Watering Pump	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
Emissions Based On	**De-Watering Pump**	30	62925.58	349799.6	344048.7	583.416	17169.1	17169.1	47364961	5667.47
Fixed Operational Hours	**Water Truck**	402	86025.7	511493.5	746921	1911.682	27528.22	25234.21	1.81E+08	58497.48
	Total Excavation Non-Haul Engines, Non-Dewater		312811	1895730	2992600	6738.714	110635.4	102185.5	6.32E+08	204056.9
	Total Haul Engines		367128.5	2424828	3342975	6264.992	132817.8	122793.8	5.93E+08	191708.8
Permitted Emissions	**Recycle Generator Set**	1015	36353.24	162538	541993.8	751.1	11867.38	11867.38	85370026	3154.62

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	1891.512	7704.85	19693.5	141.5232	756.6048	756.6048	1546683	168.7392
	982 Loader	400	1376.928	5717.376	14245.06	100.8	554.4	554.4	1145693	122.976
	980 Loader	390	1342.505	5574.442	13888.93	98.28	540.54	540.54	1117050	119.9016
	390 Excavator	530	1804.544	6180.563	19421.4	146.6192	707.7196	707.7196	1602376	160.7172
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Haul Truck	600	2160.984	7437.36	22509.98	165.984	842.688	842.688	1814010	194.712
	Skid Steer	65	64.4059	191.8228	368.1093	2.886	34.2472	34.2472	27335.18	5.772
	Telehandler/Aerial Lift	63	52.3404	152.2559	315.5657	2.30454	25.42806	25.42806	22197.76	4.6872
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On Fixed Operational Hours	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
	Water Truck	402	1430.75	4987.308	14645.41	106.932	556.0464	556.0464	1215387	128.3184
	Total Excavation Non-Haul Engines, Non-Dewater		7962.985	30508.62	82577.97	599.3449	3174.986	3174.986	6676722	711.1116
	Total Haul Engines		4321.968	14874.72	45019.97	331.968	1685.376	1685.376	3628021	389.424
Permitted Emissions	**Recycle Generator Set**	1015	7539.542	28591.37	79727.76	536.2854	2681.427	2681.427	5975891	672.9856

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	737.5536	3802.157	7187.528	13.608	277.6032	255.8304	1257528	405.5184
	982 Loader	400	532.224	3082.908	5262.506	10.08	195.552	181.44	943342.2	304.416
	980 Loader	390	518.9184	3005.835	5130.943	9.828	190.6632	176.904	919758.7	296.8056
Emissions Based On	**390 Excavator**	530	465.234	3241.92	4563.692	14.098	157.8976	146.6192	1323935	428.5792
Cycle Time	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
Analysis/Throughput	**Haul Truck**	600	935.256	6177.222	8516.192	15.96	338.352	312.816	1509787	488.376
	Skid Steer	65	8.5618	157.6174	113.7988	0.2405	4.6176	4.2809	22702.11	7.3593
	Telehandler/Aerial Lift	63	4.25754	124.0639	68.10814	0.1953	1.28898	1.21086	18440.78	5.97618
	De-Watering Pump	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Emissions Based On	**De-Watering Pump**	30	402.264	2236.162	2199.398	3.7296	109.7568	109.7568	302789.7	36.2304
Fixed Operational Hours	**Water Truck**	402	481.194	2861.094	4177.983	10.6932	153.9821	141.1502	1014875	327.2119
	Total Excavation Non-Haul Engines, Non-Dewater		2747.943	16275.59	26504.56	58.743	981.6047	907.4356	5500581	1775.867
	Total Haul Engines		1870.512	12354.44	17032.38	31.92	676.704	625.632	3019575	976.752
Permitted Emissions	**Recycle Generator Set**	1015	2544.727	11377.66	37939.56	52.577	830.7166	830.7166	5975902	220.8234

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On Cycle Time Analysis/Throughput	**988 Loader**	540	135.108	550.3464	1406.678	10.1088	54.0432	54.0432	110477.3	12.0528
	982 Loader	400	98.352	408.384	1017.504	7.2	39.6	39.6	81835.2	8.784
	980 Loader	390	95.8932	398.1744	992.0664	7.02	38.61	38.61	79789.32	8.5644
	390 Excavator	530	128.896	441.4688	1387.243	10.4728	50.5514	50.5514	114455.4	11.4798
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
	Haul Truck	600	154.356	531.24	1607.856	11.856	60.192	60.192	129572.2	13.908
Emissions Based On Fixed Operational Hours	**Skid Steer**	65	32.20295	95.9114	184.0547	1.443	17.1236	17.1236	13667.59	2.886
	Telehandler/Aerial Lift	63	26.1702	76.12794	157.7829	1.15227	12.71403	12.71403	11098.88	2.3436
	De-Watering Pump	30	0	0	0	0	0	0	0	0
	De-Watering Pump	30	0	0	0	0	0	0	0	0
	Water Truck	402	102.1964	356.2363	1046.1	7.638	39.7176	39.7176	86813.36	9.1656
	Total Excavation Non-Haul Engines, Non-Dewater		618.8188	2326.649	6191.43	45.03487	252.3598	252.3598	498137.1	55.2762
	Total Haul Engines		308.712	1062.48	3215.712	23.712	120.384	120.384	259144.3	27.816
Permitted Emissions	**Recycle Generator Set**	1015	538.5387	2042.241	5694.84	38.3061	191.5305	191.5305	426849.4	48.0704

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	52.6824	271.5826	513.3948	0.972	19.8288	18.2736	89823.45	28.9656
	982 Loader	400	38.016	220.2077	375.8933	0.72	13.968	12.96	67381.59	21.744
	980 Loader	390	37.0656	214.7025	366.4959	0.702	13.6188	12.636	65697.05	21.2004
Emissions Based On	**390 Excavator**	530	33.231	231.5657	325.978	1.007	11.2784	10.4728	94566.77	30.6128
Cycle Time	**Haul Truck**	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
Analysis/Throughput	**Haul Truck**	600	66.804	441.2302	608.2994	1.14	24.168	22.344	107841.9	34.884
	Skid Steer	65	4.2809	78.80872	56.89941	0.12025	2.3088	2.14045	11351.06	3.67965
	Telehandler/Aerial Lift	63	2.12877	62.03197	34.05407	0.09765	0.64449	0.60543	9220.39	2.98809
	De-Watering Pump	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Emissions Based On	**De-Watering Pump**	30	16.761	93.1734	91.6416	0.1554	4.5732	4.5732	12616.24	1.5096
Fixed Operational Hours	**Water Truck**	402	34.371	204.3639	298.4274	0.7638	10.99872	10.08216	72491.04	23.37228
	Total Excavation Non-Haul Engines, Non-Dewater		201.7757	1283.263	1971.143	4.3827	72.64601	67.17044	410531.3	132.5628
	Total Haul Engines		133.608	882.4603	1216.599	2.28	48.336	44.688	215683.9	69.768
Permitted Emissions	**Recycle Generator Set**	1015	181.7662	812.6902	2709.969	3.7555	59.3369	59.3369	426850.1	15.7731

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	319.436	1301.185	3325.811	23.90025	127.7744	127.7744	261201.7	28.49645
	982 Loader	400	232.5337	965.5428	2405.686	17.02297	93.62633	93.62633	193483.1	20.76802
	980 Loader	390	226.7204	941.4042	2345.544	16.59739	91.28567	91.28567	188646	20.24882
Emissions Based On	**390 Excavator**	530	293.7127	1005.966	3161.083	23.86416	115.1904	115.1904	260807.2	26.15879
Cycle Time	**Haul Truck**	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
Analysis/Throughput	**Haul Truck**	600	719.2835	2475.525	7492.448	55.24777	280.4887	280.4887	603793.4	64.80989
	Skid Steer	65	44.42281	132.3063	253.8967	1.990566	23.62139	23.62139	18853.95	3.981133
	Telehandler/Aerial Lift	63	36.10085	105.0157	217.6558	1.589515	17.53855	17.53855	15310.5	3.232912
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	563.9052	1965.661	5772.231	42.14538	219.156	219.156	479023.5	50.57446
	Total Excavation Non-Haul Engines, Non-Dewater		1716.832	6417.08	17481.91	127.1102	688.1928	688.1928	1417326	153.4606
	Total Haul Engines		1438.567	4951.051	14984.9	110.4955	560.9774	560.9774	1207587	129.6198
Permitted Emissions	**Recycle Generator Set**	1015	237.4549	900.4741	2510.995	16.8901	84.45049	84.45049	188208.4	21.19542

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is conse

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	161.9242	834.7341	1577.966	2.987531	60.94563	56.16558	276080.6	89.02842
	982 Loader	400	116.8457	676.8285	1155.342	2.212986	42.93193	39.83375	207103.5	66.83217
	980 Loader	390	113.9245	659.9077	1126.459	2.157661	41.85863	38.8379	201925.9	65.16137
Emissions Based On	**390 Excavator**	530	98.43965	685.9633	965.6392	2.98302	33.40982	31.0234	280133.6	90.6838
Cycle Time	**Haul Truck**	600	404.6899	2672.915	3684.999	6.905972	146.4066	135.357	653292.5	211.3227
Analysis/Throughput	**Haul Truck**	600	404.6899	2672.915	3684.999	6.905972	146.4066	135.357	653292.5	211.3227
	Skid Steer	65	5.905347	108.7138	78.49069	0.165881	3.184906	2.952673	15658.37	5.075944
	Telehandler/Aerial Lift	63	2.936561	85.57086	46.97636	0.134705	0.889051	0.835169	12719.2	4.121962
	De-Watering Pump	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
Emissions Based On	**De-Watering Pump**	30	138.7272	771.176	758.4977	1.286212	37.85138	37.85138	104421.9	12.49463
Fixed Operational Hours	**Water Truck**	402	189.6542	1127.65	1646.679	4.214538	60.68935	55.6319	399995.1	128.9649
	Total Excavation Non-Haul Engines, Non-Dewater		689.6301	4179.368	6597.553	14.85632	243.9093	225.2804	1393616	449.8685
	Total Haul Engines		809.3799	5345.83	7369.998	13.81194	292.8132	270.7141	1306585	422.6455
Permitted Emissions	**Recycle Generator Set**	1015	80.14518	358.335	1194.892	1.655892	26.16309	26.16309	188208.7	6.954747

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	4.17007	16.98629	43.41673	0.312005	1.668028	1.668028	3409.851	0.372006
	982 Loader	400	3.035607	12.60466	31.40497	0.222226	1.222243	1.222243	2525.82	0.271116
	980 Loader	390	2.959716	12.28954	30.61985	0.21667	1.191687	1.191687	2462.675	0.264338
Emissions Based On	**390 Excavator**	530	3.978339	13.62581	42.81687	0.32324	1.560255	1.560255	3532.634	0.354321
Cycle Time	**Haul Truck**	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
Analysis/Throughput	**Haul Truck**	600	4.764154	16.39657	49.62602	0.365932	1.857809	1.857809	3999.208	0.429266
	Skid Steer	65	0.141991	0.422897	0.811542	0.006363	0.075502	0.075502	60.26376	0.012725
	Telehandler/Aerial Lift	63	0.115391	0.335667	0.695703	0.005081	0.056059	0.056059	48.93768	0.010334
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	3.154264	10.99513	32.28759	0.235745	1.225872	1.225872	2679.47	0.282894
	Total Excavation Non-Haul Engines, Non-Dewater		17.55538	67.25999	182.0533	1.321329	6.999646	6.999646	14719.65	1.567733
	Total Haul Engines		9.528308	32.79314	99.25204	0.731864	3.715618	3.715618	7998.417	0.858533
Permitted Emissions	**Recycle Generator Set**	1015	16.62184	63.03319	175.7696	1.182307	5.911535	5.911535	13174.59	1.483679

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	1.626027	8.382321	15.84579	0.030001	0.61201	0.564009	2772.375	0.894015
	982 Loader	400	1.173353	6.796648	11.60184	0.022223	0.431118	0.400007	2079.714	0.671122
	980 Loader	390	1.144019	6.626731	11.31179	0.021667	0.42034	0.390007	2027.721	0.654344
Emissions Based On	**390 Excavator**	530	1.025665	7.147209	10.06122	0.031081	0.348105	0.32324	2918.776	0.944855
Cycle Time	**Haul Truck**	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
Analysis/Throughput	**Haul Truck**	600	2.061887	13.61844	18.77499	0.035186	0.745938	0.689641	3328.511	1.076685
	Skid Steer	65	0.018876	0.347487	0.250883	0.00053	0.01018	0.009438	50.04959	0.016224
	Telehandler/Aerial Lift	63	0.009386	0.273514	0.150153	0.000431	0.002842	0.002669	40.65496	0.013175
	De-Watering Pump	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
Emissions Based On	**De-Watering Pump**	30	0.88684	4.929892	4.848843	0.008222	0.241972	0.241972	667.537	0.079874
Fixed Operational Hours	**Water Truck**	402	1.060851	6.307633	9.210876	0.023574	0.339472	0.311183	2237.415	0.721379
	Total Excavation Non-Haul Engines, Non-Dewater		6.058178	35.88154	58.43255	0.129506	2.164068	2.000553	12126.71	3.915116
	Total Haul Engines		4.123773	27.23689	37.54998	0.070372	1.491877	1.379282	6657.022	2.15337
Permitted Emissions	**Recycle Generator Set**	1015	5.610162	25.08345	83.64242	0.115912	1.831417	1.831417	13174.61	0.486832

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2005 Baseline Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.297862	1.213306	3.101195	0.022286	0.119145	0.119145	243.5608	0.026572
	982 Loader	400	0.216829	0.900333	2.243212	0.015873	0.087303	0.087303	180.4157	0.019365
	980 Loader	390	0.211408	0.877824	2.187132	0.015476	0.08512	0.08512	175.9053	0.018881
Emissions Based On	**390 Excavator**	530	0.284167	0.973272	3.058348	0.023089	0.111447	0.111447	252.331	0.025309
Cycle Time	**Haul Truck**	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
Analysis/Throughput	**Haul Truck**	600	0.340297	1.171184	3.544716	0.026138	0.132701	0.132701	285.6577	0.030662
	Skid Steer	65	0.070995	0.211448	0.405771	0.003181	0.037751	0.037751	30.13188	0.006363
	Telehandler/Aerial Lift	63	0.057695	0.167833	0.347852	0.00254	0.02803	0.02803	24.46884	0.005167
	De-Watering Pump	30	0	0	0	0	0	0	0	0
Emissions Based On	**De-Watering Pump**	30	0	0	0	0	0	0	0	0
Fixed Operational Hours	**Water Truck**	402	0.225305	0.785367	2.306257	0.016839	0.087562	0.087562	191.3907	0.020207
	Total Excavation Non-Haul Engines, Non-Dewater		1.364262	5.129384	13.64977	0.099285	0.556358	0.556358	1098.204	0.121863
	Total Haul Engines		0.680593	2.342367	7.089431	0.052276	0.265401	0.265401	571.3155	0.061324
Permitted Emissions	**Recycle Generator Set**	1015	1.187275	4.50237	12.55497	0.08445	0.422252	0.422252	941.0418	0.105977

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2020 Project Emissions (lb/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
	988 Loader	540	0.116145	0.598737	1.131842	0.002143	0.043715	0.040286	198.0268	0.063858
	982 Loader	400	0.083811	0.485475	0.828703	0.001587	0.030794	0.028572	148.551	0.047937
	980 Loader	390	0.081716	0.473338	0.807985	0.001548	0.030024	0.027858	144.8372	0.046739
Emissions Based On	**390 Excavator**	530	0.073262	0.510515	0.718658	0.00222	0.024865	0.023089	208.484	0.06749
Cycle Time	**Haul Truck**	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
Analysis/Throughput	**Haul Truck**	600	0.147278	0.972746	1.341071	0.002513	0.053281	0.04926	237.7508	0.076906
	Skid Steer	65	0.009438	0.173743	0.125442	0.000265	0.00509	0.004719	25.0248	0.008112
	Telehandler/Aerial Lift	63	0.004693	0.136757	0.075076	0.000215	0.001421	0.001335	20.32748	0.006588
	De-Watering Pump	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
Emissions Based On	**De-Watering Pump**	30	0.036952	0.205412	0.202035	0.000343	0.010082	0.010082	27.81404	0.003328
Fixed Operational Hours	**Water Truck**	402	0.075775	0.450545	0.65792	0.001684	0.024248	0.022227	159.8154	0.051527
	Total Excavation Non-Haul Engines, Non-Dewater		0.444839	2.829111	4.345626	0.009662	0.160157	0.148085	905.0667	0.292251
	Total Haul Engines		0.294555	1.945492	2.682141	0.005027	0.106563	0.09852	475.5016	0.153812
Permitted Emissions	**Recycle Generator Set**	1015	0.400726	1.791675	5.974459	0.008279	0.130815	0.130815	941.0435	0.034774

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Baseline period of 1997 - 2006, CalEEMod Default equipment is con

For Project period of 2021 - 2035, CalEEMod Defualt equipment is cons

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

Emissions Based On
Fixed Operational Hours
Permitted Emissions

Equipment	Approximate HP	Load Factor	Max Daily Opp-Hr
Backhoe	108	0.37	2
Water Truck	402	0.38	2
Reservoir Pump Generator Set	600	0.74	8

HP estimated based on CalEEMod App D for equipment that does not have Model # listed (Except Haul Truc

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipment is conservatively estimated bas

* Assumed to operate on fixed operational hours. Other equipment operating hours are calculated based or

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	Project Operation		Annual Operating Hours	Avg Daily Operating Hours
			Max Annual Hp-Hr	Max Daily Hp-Hr		
Emissions Based On	**Backhoe**	108	25004	79.92	626	2
Fixed Operational Hours	**Water Truck**	402	15276	305.52	100	2
Permitted Emissions	**Reservoir Pump Generator Set**	600	259296	3552	584	

HP estimated based on CalEEMod App D for equipment that does not hk HP, which is based on Cat 772 or equivalent truck with 50 ton payload)

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipred on 2035 emission year (App D Table 3.4)

* Assumed to operate on fixed operational hours. Other equipment ope cycle time calculations and tonnage throughput

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions Factor (g/hp-hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	0.258	3.703	1.521	0.006	0.02	0.02	568.299	0.023
Fixed Operational Hours	**Water Truck**	402	0.208	1.105	0.348	0.005	0.013	0.013	568.299	0.018
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.11	0.978	0.328	0.005	0.011	0.011	568.299	0.009

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (g/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	6450.914	92588.12	38030.39	150.0213	500.0709	500.0709	14209488	575.0815
Fixed Operational Hours	**Water Truck**	402	3177.408	16879.98	5316.048	76.38	198.588	198.588	8681336	274.968
Permitted Emissions	**Reservoir Pump Generator Set**	600	28522.56	253591.5	85049.09	1296.48	2852.256	2852.256	1.47E+08	2333.664

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (g/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	20.61936	295.9438	121.5583	0.47952	1.5984	1.5984	45418.46	1.83816
Fixed Operational Hours	**Water Truck**	402	63.54816	337.5996	106.321	1.5276	3.97176	3.97176	173626.7	5.49936
Permitted Emissions	**Reservoir Pump Generator Set**	600	390.72	3473.856	1165.056	17.76	39.072	39.072	2018598	31.968

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (g/hr)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	10.30968	147.9719	60.77916	0.23976	0.7992	0.7992	22709.23	0.91908
Fixed Operational Hours	**Water Truck**	402	31.77408	168.7998	53.16048	0.7638	1.98588	1.98588	86813.36	2.74968
Permitted Emissions	**Reservoir Pump Generator Set**	600	48.84	434.232	145.632	2.22	4.884	4.884	252324.8	3.996

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (lb/year)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	14.22183	204.1219	83.84266	0.33074	1.102468	1.102468	31326.56	1.267838
Fixed Operational Hours	**Water Truck**	402	7.004986	37.21399	11.71988	0.168389	0.437812	0.437812	19139.07	0.606201
Permitted Emissions	**Reservoir Pump Generator Set**	600	62.88148	559.0735	187.5011	2.858249	6.288148	6.288148	324868	5.144848

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (lb/day)							
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	0.045458	0.652444	0.26799	0.001057	0.003524	0.003524	100.1306	0.004052
Fixed Operational Hours	**Water Truck**	402	0.1401	0.74428	0.234398	0.003368	0.008756	0.008756	382.7814	0.012124
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.86139	7.658542	2.568509	0.039154	0.086139	0.086139	4450.247	0.070477

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	2035 Project Emissions (lb/hr)								2035		
			ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	ROG	CO	NOX
Emissions Based On	**Backhoe**	108	0.022729	0.326222	0.133995	0.000529	0.001762	0.001762	50.06528	0.002026	0.007111	0.102061	0.041921
Fixed Operational Hours	**Water Truck**	402	0.07005	0.37214	0.117199	0.001684	0.004378	0.004378	191.3907	0.006062	0.003502	0.018607	0.00586
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.107674	0.957318	0.321064	0.004894	0.010767	0.010767	556.2809	0.00881	0.031441	0.279537	0.093751

HP estimated based on CalEEMod App D for equipment that does not ha

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipn

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

	Equipment	Approximate HP	Project Emissions (ton/yr) SO2	PM10	PM2.5	CO2	CH4
Emissions Based On	**Backhoe**	108	0.000165	0.000551	0.000551	15.66328	0.000634
Fixed Operational Hours	**Water Truck**	402	8.42E-05	0.000219	0.000219	9.569534	0.000303
Permitted Emissions	**Reservoir Pump Generator Set**	600	0.001429	0.003144	0.003144	162.434	0.002572

HP estimated based on CalEEMod App D for equipment that does not h

Load Factor Based on CalEEMod App D Table 3.3

For Project Operation period of 2035 onward, CalEEMod Defualt equipr

* Assumed to operate on fixed operational hours. Other equipment ope

Max Year Emissions (Mitigated)

Aggregates Fugitive Mining, Storage, and Sitewide Drop Emissions

Drops from stationary equipment (i.e., conveyors) are included in the plant emissions calculations.

Drop, Mining, and Storage Pile Emissions Factors

Material Drop Emission Factor from AP42 13.2.4:

PM10 E.F. (lb/ton) = $k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$

k = particle size multiplier =	0.35
U = mean wind speed[1] =	4.9
M = material moisture content =	3
PM10 EF (lb/ton) =	0.00062
PM2.5 EF[2] (lb/ton) =	0.00018

Bulldozing Emission Factor, CalEEMod User Manual, Appendix A:

EF PM10 (lb/hr) = 1.0 * s^1.5 / 7.9 * 0.75 =	0.67	
EF PM2.5 (lb/hr) = 5.7 * s^1.2 / 7.9 * 0.105 =	0.09	
s (silt, %) =	6.9	
Watering C.E. =	61%	water every 3 hours if material is not already wet
days of rain =	51	

Quarry Operation Fugitive Emissions:

lbs PM10 / Ton Quarried[3] =	0.021
lbs PM2.5/lbs PM10 =	0.292

Storage Pile Emissions Controlled Factor from SSP1610 - Aggregate Processing:

lb PM10/acre/day 1.054

	Area (acres)	lbs PM10/hr	lbs PM10/day	lbs PM10/yr
Baseline Storage	2	0.1	2.1	769.4
Project Storage	2	0.1	2.1	769.4

Notes:

[1] Mean wind speed based on data for Tulare in Table 1 of CalEEMod User Manual Appendix D which states 2.2 m/s (equvalent to 4.921 mph).

[2] PM2.5 emission factor assumed to be 29.2% of PM10 for material drops based on SCAQMD's *Updated CEIDARS Table with PM2.5 Fractions for mineral products - loading*

[3] Emission Factor from San Diego Air Pollution Control District, *Quarry Operations, General* (https://bit.ly/2XXNWUl)

Drop and Mining Emissions - Baseline

	Throughput			PM10 Emissions			PM2.5 Emissions		
Activity	Peak Hour (tph)	Peak Day (tpd)	Peak Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)
Excavation Process	1,000	6,000	714,286	21	126	15,000	6	37	4,380
Excavation to Haul Truck/Conveyor	650	4,000	500,000	0.4	2	311	0.1	1	91
Haul Truck/Conveyor to Plant Feed Pile	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Plant	650	4,000	500,000	0.4	2	311	0.1	1	91
Loader to Export Trucks	650	4,000	500,000	0.4	2	311	0.1	1	91

Drop and Mining Emissions - Project

	Throughput			PM10 Emissions			PM2.5 Emissions		
Activity	Peak Hour (tph)	Peak Day (tpd)	Peak Annual (tpy)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)	Peak Hour (lb/hr)	Peak Day (lb/day)	Peak Annual (lb/yr)
Excavation Process	1,000	6,000	928,571	21	126	19,500	6	37	5,694
Excavation to Haul Truck/Conveyor	700	7,000	650,000	0.4	4	404	0.1	1	118
Haul Truck/Conveyor to Plant Feed Pile	700	7,000	650,000	0.4	4	404	0.1	1	118
Slurry Wall Construction	192	1,538	468,450	0.1	1	291	0.0	0.3	85
Loader to Plant	700	7,000	650,000	0.4	4	404	0.1	1	118
Loader to Export Trucks	700	7,000	650,000	0.4	4	404	0.1	1	118

Max Year Emissions (Mitigated)

Recycle Plant - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.002367
Basline Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	1.1834
Total PM2.5 Emissions, lb/hr	0.35

	Max (ton/hr)
Processing	500

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	500	9	*Truck Unloading Stone*	0.000016	0.0080
3	Hopper	Conveyor 1	0	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
4	Conveyor 1	Jaw Crusher	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
5	Jaw Crusher	Conveyor 2	215	500	2	*Primary Crushing*	0.000540	0.2700
6	Conveyor 2	Screen 1	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
7	Screen 1	Conveyor 3, 4, 5	60	500	1	*Screening*	0.000740	0.3700
8	Conveyor 3	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
9	Conveyor 4	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
10	Conveyor 5	Conveyor 6	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
11	Conveyor 6	Cone Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
12	Cone Crusher	Conveyor 7, 8	200	350	3	*Secondary Crushing*	0.000540	0.1890
13	Conveyor 7	Conveyor 9	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
14	Conveyor 8	Screen 2	200	263	7	*Conv. Transfer Pt.*	0.000046	0.0121
15	Conveyor 9	Pile	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
16	Screen 2	Conveyor 10, 11, 12	60	263	1	*Screening*	0.000740	0.1943
17	Conveyor 10	Conveyor 13	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
18	Conveyor 11	Conveyor 14	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
19	Conveyor 12	Conveyor 15	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
20	Conveyor 13	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
21	Conveyor 14	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
22	Conveyor 15	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Description	PM 10 No Contro	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drilling	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Max Year Emissions (Mitigated)

Recycle Plant - Project

	Max (ton/hr)
Processing	500

Project Factor PM10 Emissions (lbs/ton)	0.002367
Project Factor PM2.5 Emissions (lbs/ton)	0.000691
Total PM10 Emissions, lb/hr	1.1834
Total PM2.5 Emissions, lb/hr	0.35

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	500	9	*Truck Unloading Stone*	0.000016	0.0080
3	Hopper	Conveyor 1	0	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
4	Conveyor 1	Jaw Crusher	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
5	Jaw Crusher	Conveyor 2	215	500	2	*Primary Crushing*	0.000540	0.2700
6	Conveyor 2	Screen 1	20	500	7	*Conv. Transfer Pt.*	0.000046	0.0230
7	Screen 1	Conveyor 3, 4, 5	60	500	1	*Screening*	0.000740	0.3700
8	Conveyor 3	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
9	Conveyor 4	Pile	20	75	7	*Conv. Transfer Pt.*	0.000046	0.0035
10	Conveyor 5	Conveyor 6	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
11	Conveyor 6	Cone Crusher	20	350	7	*Conv. Transfer Pt.*	0.000046	0.0161
12	Cone Crusher	Conveyor 7, 8	200	350	3	*Secondary Crushing*	0.000540	0.1890
13	Conveyor 7	Conveyor 9	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
14	Conveyor 8	Screen 2	200	263	7	*Conv. Transfer Pt.*	0.000046	0.0121
15	Conveyor 9	Pile	20	88	7	*Conv. Transfer Pt.*	0.000046	0.0040
16	Screen 2	Conveyor 10, 11, 12	60	263	1	*Screening*	0.000740	0.1943
17	Conveyor 10	Conveyor 13	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
18	Conveyor 11	Conveyor 14	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
19	Conveyor 12	Conveyor 15	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
20	Conveyor 13	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
21	Conveyor 14	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
22	Conveyor 15	Pile	20	87	7	*Conv. Transfer Pt.*	0.000046	0.0040
		Total HP:	1015					

Plant equipment based on Portable Equipment Registration No: 112696

Emission factors from AP 42 Table 11.19.2-2

Max Year Emissions (Mitigated)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000108
Basline Factor PM2.5 Emissions (lbs/ton)	0.000031536
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	650

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Table 3 - Emission Factors (lb/ton)

AP 42 Table 11.19.2-2, 8/04

Operation Type	Descriptio	PM 10 No Control	PM 10 Control	% Reduction
0	Mis. Ops	0.000000	0	
1	Screening	0.008700	0.000740	0.91
2	Primary Cr	0.002400	0.000540	0.78
3	Secondary	0.002400	0.000540	0.78
4	Tertiary Cr	0.002400	0.000540	0.78
5	Fines Crus	0.015000	0.001200	0.92
6	Fines Scre	0.072000	0.002200	0.97
7	Conv. Trar	0.001100	0.000046	0.96
8	Wet Drillin	0.000080		
9	Truck Unlo	0.000016		

Emission Factors from AP-42 Table 11.19.2-2

PM2.5 emission factor assumed to be 29.2% of PM10 based on SCAQMD's Updated CEIDARS

Wet processing not included as emissions are zero

Max Year Emissions (Mitigated)

Aggregate Screening and Washing System - Baseline

Basline Factor PM10 Emissions (lbs/ton)	0.000100286
Basline Factor PM2.5 Emissions (lbs/ton)	2.92834E-05
Total PM10 Emissions, lb/hr	0.0702
Total PM2.5 Emissions, lb/hr	0.02

	Max (ton/hr)
Processing	700

Emission Point	Location From	Location To	Scale Estimated HP	Scale Max. (tph)	Operation Type Code	Operation Type Description	Emiss. Factor PM10 (lb/ton)	Emiss. Max. (lb/hr)
1	Truck	Hopper	0	650	9	*Truck Unloading Stone*	0.000016	0.0104
2	Hopper	Conveyor 1	0	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
3	Conveyor 1	Wet Screen	30	650	7	*Conv. Transfer Pt.*	0.000046	0.0299
N/A	Wet Screen	Conveyor 2	40	650	0	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 2	Conveyor 3	15	650	1	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 3	Conveyor 4	20	650	2	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 4	Conveyor 5	15	650	3	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 5	Conveyor 6	20	650	4	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 6	Sand Screw 1	5	325	5	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 1	Conveyor 7	40	325	6	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 7	Conveyor 8	15	325	7	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 8	Conveyor 9	25	325	8	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 9	Sand Screw 2	5	325	9	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Sand Screw 2	Conveyor 10	40	325	10	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 10	Conveyor 11	15	325	11	Wet Screening - No Ems.	0.000000	*0.0000*
N/A	Conveyor 11	Pile	30					
		Total HP:	315					

Plant equipment based on SCAQMD Permit G53802

Emission factors from AP 42 Table 11.19.2-2

Max Year Emissions (Mitigated)

Truck Loading and Maneuvering	Baseline	Project		
Excavator Production Rate	691	691	tons/hour	4.3 cy bucket cycle time analysis
Truck payload	50	50	tons	
Time to load a truck	4.3	4.3	minutes	Calculation
Time to maneuver	0.8	0.8	minutes	Caterpillar Handbook (44 ed.)
Total time load and maneuver	5.1	5.1	minutes	Calculation
Haul Road Length	0.3	0.6	miles	Assumes avg. trip to be half of site length/longest path
Truck Haul Avg Speed	30.0	30.0	mph	
Haul Time	0.6	1.2	minutes	
Total Time Per Load	5.7	6.3	minutes	
Material transported by Truck	100%	100%	Percent of total material	
VMT/Ton Transferred	0.012	0.024		
Operating Hour/Ton Transferred	0.0038	0.0042		
Vehicle HP	600	600		
HP-HR/Ton Transferred	2.30	2.54		
lb PM10 Ems/Ton Transferred	0.025	0.025	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM2.5 Ems/Ton Transferred	0.005	0.005	VMT/Ton Transferred Multiplied by PM Emission rate below	
lb PM10 Ems/Ton Processed	0.025	0.025	Takes into account percent of total material transported by truck	
lb PM2.5 Ems/Ton Processed	0.005	0.005	Takes into account percent of total material transported by truck	
Annual Rainfall Reduction Factor	0.860273973	0.860274		

Max Year Emissions (Mitigated)

Basline Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**2.06**	**0.44**	**1.40**	**0.30**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
Control efficiency for unpaved roads in baseline is 80% for watering.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Basline Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Baseline C.E. =	80%	80%	80%	80%
Baseline EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2
Control efficiency for unpaved roads in baseline is 80% for watering.

Future Unpaved Road Emission Factors

Unpaved Road emissions factor from AP42 Section 13.2.2

EF (lb/VMT)= 4.9 * (S/12)$^{0.7}$ * (W/3)$^{0.45}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
S = silt content (%) =	4.8		4.8	
W_l = loaded truck wt (tons) =	90		40	
W_u = unloaded truck wt (tons) =	40		15	
W = avg truck weight	65		27.5	
EF (lb/VMT) =	10.30	2.18	6.99	1.48
Future C.E. =	90%	90%	90%	90%
Future EF (lb/VMT) =	**1.03**	**0.22**	**0.70**	**0.15**

Silt content based on mean Sand and Gravel Processing from AP-42 Table 13.2.2-1.
PM2.5 emissions are 21.2% of PM10 for unpaved roads (SCAQMD *Updated CEIDARS Table).*

Future Paved Road Emission Factors

Paved Road emissions factor from AP42 Section 13.2.1

EF (lb/VMT)= k * (sL)$^{0.91}$ * (W)$^{1.02}$

	Mining Haul Trucks		On-road Trucks	
	PM10	PM2.5	PM10	PM2.5
k= particle size multiplier (lb/vmt) =	0.0022	0.00054	0.0022	0.00054
sL = road surface silt loading (g/m^2) =	0.2	0.2	0.2	0.2
W_l = loaded truck wt (tons) =	90	120	40	40
W_u = unloaded truck wt (tons) =	40	50	15	15
W = avge truck weight	65.00	85.00	27.50	27.50
EF (lb/VMT) =	0.04	0.01	0.01	0.00
Future C.E. =	80%	80%	80%	80%
Future EF (lb/VMT) =	**0.0072**	**0.0023**	**0.0030**	**0.0007**

Particle size multiplier based on AP-42 Table 13.2.1-1
Silt Loading based on ADT of 500 - 5000 from AP-42 Table 13.1-2

Max Year Emissions (Mitigated)

Source: EMFAC2021 (v1.0.0) Emission Rates
Region Type: Sub-Area
Region: Tuolumne (MC)
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, g/mile for RUNEX, PMBW and PMTW, mph for Speed

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Total VMT	CVMT	EVMT	NOx_RUNEX
Tuolumne (MC)	2021	T7 Tractor Class 8	2021	15	Diesel	0.051113349	0.051113349	0	2.951511768

PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	SOx_RUNEX	NH3_RUNEX	PM10_PMBW	PM2.5_PMBW
0.003375524	0.00352815	1891.421977	0.000909605	0.297994303	0.019583553	0.022294384	0.2189903	0.017910635	0.22	0.135264231	0.047342481

	Excavation Activity				Excavation Emissions (lbs)									
	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	25	26000	41600	1.79605	20.08410	270.68994	1.64263	0.32357	0.30958	173466.66179	0.08342	64.12994	13.59555
On-Road Truck Emissions Daily	1.6	25	280	448	0.01934	0.21629	2.91512	0.01769	0.00348	0.00333	1868.10251	0.00090	0.69063	0.14641
On-Road Truck Emissions Hourly	1.6	25	28	44.8	0.00193	0.02163	0.29151	0.00177	0.00035	0.00033	186.81025	0.00009	0.06906	0.01464

	Operation Activity				Operation Emissions (lbs)									
	Loop Milage	Truck Capacity (tons)	Trip Count	Miles Traveled	ROG	CO	NOX	SO2	PM10	PM2.5	CO2	CH4	PM10 Fugitive	PM2.5 Fugitive
On-Road Truck Emissions Annual	1.6	N/A	N/A	2530	0.10923	1.22146	16.46263	0.09990	0.01968	0.01883	10549.77534	0.00507	3.90021	0.82684
On-Road Truck Emissions Daily	1.6	N/A	N/A	50.6	0.00218	0.02443	0.32925	0.00200	0.00039	0.00038	210.99551	0.00010	0.07800	0.01654
On-Road Truck Emissions Hourly	1.6	N/A	N/A	10	0.00043	0.00483	0.06507	0.00039	0.00008	0.00007	41.69872	0.00002	0.01542	0.00327

Off-Road Emissions Emissions Calculations - Cycle Time Analyses

Assumptions

Parameters	Truck Loading
Loader Model	980H Loader
Travel Distance (avg) (meters)	15
Bucket Payload[1] (yd^3)	7.00
Bucket Payload in Tons	10.5
Material Type[2]	Uniform Agg > 1"
Bucket Fill Factor[2]	85%
Job Efficiency[3] (work 50 min/hr)	83%
Grade Resistance[4]	0%
Rolling Resistance[4]	3%
Total Resistance[4]	3%

Cycle Time (mins)

Hydraulic Cycle Time [5]	Truck Loading	
Average Cycle Time [6]		0.65
Material Handler?	Yes	-0.05
Materials:	3/4" to 6"	0.00
Pile:	Conveyor piled >10'	0.00
Truck Ownership:	Common	-0.04
Operation Cycle:	Constant	-0.04
Target Type:	N/A	0.00
Total Hydraulic Cycle Time		**0.52**

Total Cycle Time (mins)	Truck Loading
Hydraulic Cycle Time (min/cycle)	0.52
Travel with load[7] (min/cycle)	0.08
Travel empty[7] (min/cycle)	0.07
Total Cycle Time (min/cycle)	**0.67**

Rate Calculations

Production Calculations	Truck Loading
Cycles per Hour	74.6
Production Rate (tph)	666

[1] Bucket payload ranges based on activity type and equipment size. In this case, heaped bucket capacity for the 980H is equal to the bucket capacity of a 988 that is equipped for digging. Thus, all three loaders (980, 982, 988) have similar e

[2] Material type and bucket fill factor from Caterpillar Performance Handbook Edition 41, January 2011

[3] Job efficiency accounts for operator skill, minor repairs and adjustments, personnel delays, and delays caused by job l CPH suggested 50 minutes (83%) (CPH page 12-80)

[4] Resisitance from CPH pg 22-5 and 22-6 and "Typical Rolling Resistance Factors" table on page 27-1

[5] Guidelines for "Selecting a Machine" on page 12-79 and 12-80 of CPH were used to determine the hydraulic cycle time

[6] Average cycle time for this type of equipment is tabulated on page 12-80 of CPH.

[7] Figures on pages 12-149 through 12-156 in the CPH were used to estimate the travel times for theloaders.

Excavator Cycle Time Analysis

Assumptions

Excavator Bucket Size =	4.3	yd^3
Material Type =	Sand and Gravel	
Sand and Gravel density =	1.5	$tons/yd^3$

Cycle Time

From the Caterpillar Performance Handbook, Edition 41 (2011)
page 4-183 "Cycle Time Estimating Chart"
Based on the low end of the typical range due to the loose configuration of material to be moved.

Cycle Time =	0.28	minutes

Production Estimate

Production Rate =	691	yd^3/hour
Production Rate =	1037	tons/hour
Job Efficiency* =	67%	
Production Rate =	691	tons/hour

* Job efficiency is estimated to be 40 minutes per hour to account for operator skill, minor delays, and periodic excavator transportation

APPENDIX D

CONSTRUCTION PHASE EMISSIONS CALCULATIONS

CalEEMod Model Output
Criteria Pollutants and Greenhouse Gasses

McKay Point Reservoir Project Construction

Tulare County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	200.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	51
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

McKay Point Reservoir Project Construction - Tulare County, Annual

Project Characteristics -

Land Use - The Owners propose to develop approximately 200 acres within the 500 acre McKay Point property.

Construction Phase - Construction timeline and activity levels based on Provost & Pritchard Consulting Group communication dated 3/18/2015 (Appendix B of Air Quality Report).

Off-road Equipment - Operational days conservatively based on equipment with longest construction timeline.

Off-road Equipment - See Appendix B

Off-road Equipment - See Appendix B

Road Dust - Site roads are conservatively assumed to be un-paved.

Construction Off-road Equipment Mitigation -

Operational Off-Road Equipment -

Off-road Equipment - See Appendix B
In/Out Flow Grading/Dozing is separated from In/Out-Flow Excavation in CalEEMod model but sourced from the same table of Provost & Pritchard Consulting Memo.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	310.00	1.00
tblConstructionPhase	NumDays	310.00	6.00
tblConstructionPhase	NumDays	220.00	10.00
tblConstructionPhase	PhaseEndDate	2/4/2022	7/19/2021
tblConstructionPhase	PhaseEndDate	9/29/2023	8/1/2022
tblConstructionPhase	PhaseEndDate	7/22/2022	2/18/2022
tblGrading	AcresOfGrading	3.00	2.50
tblLandUse	LotAcreage	0.00	200.00
tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	231.00	250.00

tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	408.00
tblOffRoadEquipment	HorsePower	212.00	530.00
tblOffRoadEquipment	HorsePower	212.00	165.00
tblOffRoadEquipment	HorsePower	187.00	200.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.73
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.74	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.29	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.37	0.36
tblOffRoadEquipment	LoadFactor	0.74	0.38
tblOffRoadEquipment	LoadFactor	0.43	0.29
tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Concrete/Industrial Saws	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Cranes
tblOffRoadEquipment	OffRoadEquipmentType	Scrapers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Paving Equipment	Tractors/Loaders/Backhoes

tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblRoadDust	RoadPercentPave	100	0
tblTripsAndVMT	WorkerTripNumber	23.00	5.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0486	0.4928	0.2889	1.0900e-003	6.5900e-003	0.0176	0.0242	2.4000e-003	0.0162	0.0186	0.0000	95.9576	95.9576	0.0305	0.0000	96.7196
2022	0.0235	0.2359	0.1984	4.6000e-004	0.0275	0.0101	0.0376	0.0112	9.3600e-003	0.0205	0.0000	40.7375	40.7375	0.0122	0.0000	41.0418
Maximum	**0.0486**	**0.4928**	**0.2889**	**1.0900e-003**	**0.0275**	**0.0176**	**0.0376**	**0.0112**	**0.0162**	**0.0205**	**0.0000**	**95.9576**	**95.9576**	**0.0305**	**0.0000**	**96.7196**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0486	0.4928	0.2889	1.0900e-003	3.9400e-003	0.0176	0.0216	1.3000e-003	0.0162	0.0175	0.0000	95.9575	95.9575	0.0305	0.0000	96.7195
2022	0.0235	0.2359	0.1984	4.6000e-004	0.0116	0.0101	0.0217	4.6000e-003	9.3600e-003	0.0140	0.0000	40.7375	40.7375	0.0122	0.0000	41.0417
Maximum	**0.0486**	**0.4928**	**0.2889**	**1.0900e-003**	**0.0116**	**0.0176**	**0.0217**	**4.6000e-003**	**0.0162**	**0.0175**	**0.0000**	**95.9575**	**95.9575**	**0.0305**	**0.0000**	**96.7195**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.34**	**0.00**	**29.96**	**56.55**	**0.00**	**19.61**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	5-1-2021	7-31-2021	0.5439	0.5439
4	2-1-2022	4-30-2022	0.1355	0.1355
5	5-1-2022	7-31-2022	0.1328	0.1328
6	8-1-2022	9-30-2022	0.0148	0.0148
		Highest	0.5439	0.5439

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	In/Out Flow Excavation	Trenching	5/1/2021	7/19/2021	5	56	
2	In/Out Flow Building	Paving	2/5/2022	2/18/2022	5	10	
3	Generator Building and Barge Pump Placement	Grading	7/23/2022	8/1/2022	5	6	
4	In/Out Flow Grading/Dozing	Grading	5/5/2021	5/5/2021	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

McKay Point Reservoir Project Construction - Tulare County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
In/Out Flow Building	Excavators	1	8.00	184	0.42
In/Out Flow Excavation	Off-Highway Trucks	1	2.00	230	0.38
In/Out Flow Excavation	Excavators	1	8.00	184	0.73
Generator Building and Barge Pump Placement	Tractors/Loaders/Backhoes	1	8.00	108	0.38
In/Out Flow Building	Tractors/Loaders/Backhoes	1	8.00	408	0.36
In/Out Flow Building	Generator Sets	1	8.00	84	0.38
In/Out Flow Excavation	Crawler Tractors	1	8.00	530	0.29
In/Out Flow Grading/Dozing	Excavators	2	8.00	158	0.38
Generator Building and Barge Pump Placement	Graders	1	8.00	187	0.41
In/Out Flow Excavation	Off-Highway Trucks	1	8.00	300	0.40
Generator Building and Barge Pump Placement	Generator Sets	1	8.00	84	0.40
In/Out Flow Building	Pavers	2	8.00	130	0.42
Generator Building and Barge Pump Placement	Excavators	1	8.00	184	0.41
In/Out Flow Building	Paving Equipment	2	8.00	132	0.36
In/Out Flow Building	Rollers	2	8.00	80	0.38
Generator Building and Barge Pump Placement	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Building	Cranes	1	8.00	250	0.40
Generator Building and Barge Pump Placement	Off-Highway Trucks	1	1.00	230	0.48
Generator Building and Barge Pump Placement	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Crawler Tractors	1	8.00	165	0.38
In/Out Flow Grading/Dozing	Graders	1	8.00	200	0.41
In/Out Flow Grading/Dozing	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Grading/Dozing	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
In/Out Flow Excavation	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Building	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Generator Building and Barge Pump Plac	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Grading/Dozing	9	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0450	0.4662	0.2635	1.0400e-003		0.0165	0.0165		0.0152	0.0152	0.0000	91.1035	91.1035	0.0295	0.0000	91.8401
Total	**0.0450**	**0.4662**	**0.2635**	**1.0400e-003**		**0.0165**	**0.0165**		**0.0152**	**0.0152**	**0.0000**	**91.1035**	**91.1035**	**0.0295**	**0.0000**	**91.8401**

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	7.8000e-004	8.0400e-003	2.0000e-005	2.2300e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	1.8561	1.8561	5.0000e-005	0.0000	1.8574
Total	**1.2100e-003**	**7.8000e-004**	**8.0400e-003**	**2.0000e-005**	**2.2300e-003**	**2.0000e-005**	**2.2500e-003**	**5.9000e-004**	**1.0000e-005**	**6.1000e-004**	**0.0000**	**1.8561**	**1.8561**	**5.0000e-005**	**0.0000**	**1.8574**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0450	0.4662	0.2635	1.0400e-003		0.0165	0.0165		0.0152	0.0152	0.0000	91.1034	91.1034	0.0295	0.0000	91.8400
Total	**0.0450**	**0.4662**	**0.2635**	**1.0400e-003**		**0.0165**	**0.0165**		**0.0152**	**0.0152**	**0.0000**	**91.1034**	**91.1034**	**0.0295**	**0.0000**	**91.8400**

3.2 In/Out Flow Excavation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	7.8000e-004	8.0400e-003	2.0000e-005	2.2300e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	1.8561	1.8561	5.0000e-005	0.0000	1.8574
Total	**1.2100e-003**	**7.8000e-004**	**8.0400e-003**	**2.0000e-005**	**2.2300e-003**	**2.0000e-005**	**2.2500e-003**	**5.9000e-004**	**1.0000e-005**	**6.1000e-004**	**0.0000**	**1.8561**	**1.8561**	**5.0000e-005**	**0.0000**	**1.8574**

3.3 In/Out Flow Building - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0122	0.1224	0.1205	2.7000e-004		5.5000e-003	5.5000e-003		5.0900e-003	5.0900e-003	0.0000	23.6812	23.6812	7.2600e-003	0.0000	23.8626
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0122**	**0.1224**	**0.1205**	**2.7000e-004**		**5.5000e-003**	**5.5000e-003**		**5.0900e-003**	**5.0900e-003**	**0.0000**	**23.6812**	**23.6812**	**7.2600e-003**	**0.0000**	**23.8626**

3.3 In/Out Flow Building - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.1000e-004	3.2500e-003	1.0000e-005	1.0000e-003	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7992	0.7992	2.0000e-005	0.0000	0.7998
Total	**5.0000e-004**	**3.1000e-004**	**3.2500e-003**	**1.0000e-005**	**1.0000e-003**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7992**	**0.7992**	**2.0000e-005**	**0.0000**	**0.7998**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0122	0.1224	0.1205	2.7000e-004		5.5000e-003	5.5000e-003		5.0900e-003	5.0900e-003	0.0000	23.6811	23.6811	7.2600e-003	0.0000	23.8626
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0122**	**0.1224**	**0.1205**	**2.7000e-004**		**5.5000e-003**	**5.5000e-003**		**5.0900e-003**	**5.0900e-003**	**0.0000**	**23.6811**	**23.6811**	**7.2600e-003**	**0.0000**	**23.8626**

3.3 In/Out Flow Building - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.1000e-004	3.2500e-003	1.0000e-005	1.0000e-003	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.7992	0.7992	2.0000e-005	0.0000	0.7998
Total	**5.0000e-004**	**3.1000e-004**	**3.2500e-003**	**1.0000e-005**	**1.0000e-003**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.7992**	**0.7992**	**2.0000e-005**	**0.0000**	**0.7998**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0260	0.0000	0.0260	0.0108	0.0000	0.0108	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1130	0.0731	1.8000e-004		4.6200e-003	4.6200e-003		4.2700e-003	4.2700e-003	0.0000	15.8735	15.8735	4.8800e-003	0.0000	15.9955
Total	**0.0105**	**0.1130**	**0.0731**	**1.8000e-004**	**0.0260**	**4.6200e-003**	**0.0306**	**0.0108**	**4.2700e-003**	**0.0151**	**0.0000**	**15.8735**	**15.8735**	**4.8800e-003**	**0.0000**	**15.9955**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.5000e-004	1.5600e-003	0.0000	4.8000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3836	0.3836	1.0000e-005	0.0000	0.3839
Total	**2.4000e-004**	**1.5000e-004**	**1.5600e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3836**	**0.3836**	**1.0000e-005**	**0.0000**	**0.3839**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0102	0.0000	0.0102	4.2100e-003	0.0000	4.2100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0105	0.1130	0.0731	1.8000e-004		4.6200e-003	4.6200e-003		4.2700e-003	4.2700e-003	0.0000	15.8735	15.8735	4.8800e-003	0.0000	15.9955
Total	**0.0105**	**0.1130**	**0.0731**	**1.8000e-004**	**0.0102**	**4.6200e-003**	**0.0148**	**4.2100e-003**	**4.2700e-003**	**8.4800e-003**	**0.0000**	**15.8735**	**15.8735**	**4.8800e-003**	**0.0000**	**15.9955**

3.4 Generator Building and Barge Pump Placement - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4000e-004	1.5000e-004	1.5600e-003	0.0000	4.8000e-004	0.0000	4.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3836	0.3836	1.0000e-005	0.0000	0.3839
Total	**2.4000e-004**	**1.5000e-004**	**1.5600e-003**	**0.0000**	**4.8000e-004**	**0.0000**	**4.8000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.3836**	**0.3836**	**1.0000e-005**	**0.0000**	**0.3839**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.3400e-003	0.0000	4.3400e-003	1.8000e-003	0.0000	1.8000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3500e-003	0.0258	0.0173	3.0000e-005		1.1300e-003	1.1300e-003		1.0400e-003	1.0400e-003	0.0000	2.9815	2.9815	9.6000e-004	0.0000	3.0056
Total	**2.3500e-003**	**0.0258**	**0.0173**	**3.0000e-005**	**4.3400e-003**	**1.1300e-003**	**5.4700e-003**	**1.8000e-003**	**1.0400e-003**	**2.8400e-003**	**0.0000**	**2.9815**	**2.9815**	**9.6000e-004**	**0.0000**	**3.0056**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0166	0.0166	0.0000	0.0000	0.0166
Total	**1.0000e-005**	**1.0000e-005**	**7.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0166**	**0.0166**	**0.0000**	**0.0000**	**0.0166**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.6900e-003	0.0000	1.6900e-003	7.0000e-004	0.0000	7.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3500e-003	0.0258	0.0173	3.0000e-005		1.1300e-003	1.1300e-003		1.0400e-003	1.0400e-003	0.0000	2.9814	2.9814	9.6000e-004	0.0000	3.0056
Total	**2.3500e-003**	**0.0258**	**0.0173**	**3.0000e-005**	**1.6900e-003**	**1.1300e-003**	**2.8200e-003**	**7.0000e-004**	**1.0400e-003**	**1.7400e-003**	**0.0000**	**2.9814**	**2.9814**	**9.6000e-004**	**0.0000**	**3.0056**

3.5 In/Out Flow Grading/Dozing - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	7.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0166	0.0166	0.0000	0.0000	0.0166
Total	**1.0000e-005**	**1.0000e-005**	**7.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0166**	**0.0166**	**0.0000**	**0.0000**	**0.0166**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.533627	0.031932	0.174885	0.126979	0.018773	0.004811	0.020615	0.079394	0.001826	0.001217	0.004186	0.001092	0.000663

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

McKay Point Reservoir Project Construction

Tulare County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	200.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	51
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

McKay Point Reservoir Project Construction - Tulare County, Summer

Project Characteristics -

Land Use - The Owners propose to develop approximately 200 acres within the 500 acre McKay Point property.

Construction Phase - Construction timeline and activity levels based on Provost & Pritchard Consulting Group communication dated 3/18/2015 (Appendix B of Air Quality Report).

Off-road Equipment - Operational days conservatively based on equipment with longest construction timeline.

Off-road Equipment - See Appendix B

Off-road Equipment - See Appendix B

Road Dust - Site roads are conservatively assumed to be un-paved.

Construction Off-road Equipment Mitigation -

Operational Off-Road Equipment -

Off-road Equipment - See Appendix B
In/Out Flow Grading/Dozing is separated from In/Out-Flow Excavation in CalEEMod model but sourced from the same table of Provost & Pritchard Consulting Memo.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	310.00	1.00
tblConstructionPhase	NumDays	310.00	6.00
tblConstructionPhase	NumDays	220.00	10.00
tblConstructionPhase	PhaseEndDate	2/4/2022	7/19/2021
tblConstructionPhase	PhaseEndDate	9/29/2023	8/1/2022
tblConstructionPhase	PhaseEndDate	7/22/2022	2/18/2022
tblGrading	AcresOfGrading	3.00	2.50
tblLandUse	LotAcreage	0.00	200.00
tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	231.00	250.00

tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	408.00
tblOffRoadEquipment	HorsePower	212.00	530.00
tblOffRoadEquipment	HorsePower	212.00	165.00
tblOffRoadEquipment	HorsePower	187.00	200.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.73
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.74	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.29	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.37	0.36
tblOffRoadEquipment	LoadFactor	0.74	0.38
tblOffRoadEquipment	LoadFactor	0.43	0.29
tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Concrete/Industrial Saws	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Cranes
tblOffRoadEquipment	OffRoadEquipmentType	Scrapers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Paving Equipment	Tractors/Loaders/Backhoes

tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblRoadDust	RoadPercentPave	100	0
tblTripsAndVMT	WorkerTripNumber	23.00	5.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.3856	68.3600	44.5718	0.1061	8.7966	2.8582	11.6548	3.6292	2.6296	6.2588	0.0000	10,279.8093	10,279.8093	3.2893	0.0000	10,362.0416
2022	3.5984	37.7216	24.9719	0.0619	8.8376	1.5397	10.3774	3.6401	1.4229	5.0630	0.0000	5,987.1621	5,987.1621	1.7976	0.0000	6,032.1012
Maximum	**6.3856**	**68.3600**	**44.5718**	**0.1061**	**8.8376**	**2.8582**	**11.6548**	**3.6401**	**2.6296**	**6.2588**	**0.0000**	**10,279.8093**	**10,279.8093**	**3.2893**	**0.0000**	**10,362.0416**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.3856	68.3600	44.5718	0.1061	3.5058	2.8582	6.3640	1.4353	2.6296	4.0649	0.0000	10,279.8093	10,279.8093	3.2893	0.0000	10,362.0416
2022	3.5984	37.7216	24.9719	0.0619	3.5469	1.5397	5.0866	1.4462	1.4229	2.8691	0.0000	5,987.1621	5,987.1621	1.7976	0.0000	6,032.1012
Maximum	**6.3856**	**68.3600**	**44.5718**	**0.1061**	**3.5469**	**2.8582**	**6.3640**	**1.4462**	**2.6296**	**4.0649**	**0.0000**	**10,279.8093**	**10,279.8093**	**3.2893**	**0.0000**	**10,362.0416**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**60.01**	**0.00**	**48.03**	**60.36**	**0.00**	**38.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	In/Out Flow Excavation	Trenching	5/1/2021	7/19/2021	5	56	
2	In/Out Flow Building	Paving	2/5/2022	2/18/2022	5	10	
3	Generator Building and Barge Pump Placement	Grading	7/23/2022	8/1/2022	5	6	
4	In/Out Flow Grading/Dozing	Grading	5/5/2021	5/5/2021	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

McKay Point Reservoir Project Construction - Tulare County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
In/Out Flow Building	Excavators	1	8.00	184	0.42
In/Out Flow Excavation	Off-Highway Trucks	1	2.00	230	0.38
In/Out Flow Excavation	Excavators	1	8.00	184	0.73
Generator Building and Barge Pump Placement	Tractors/Loaders/Backhoes	1	8.00	108	0.38
In/Out Flow Building	Tractors/Loaders/Backhoes	1	8.00	408	0.36
In/Out Flow Building	Generator Sets	1	8.00	84	0.38
In/Out Flow Excavation	Crawler Tractors	1	8.00	530	0.29
In/Out Flow Grading/Dozing	Excavators	2	8.00	158	0.38
Generator Building and Barge Pump Placement	Graders	1	8.00	187	0.41
In/Out Flow Excavation	Off-Highway Trucks	1	8.00	300	0.40
Generator Building and Barge Pump Placement	Generator Sets	1	8.00	84	0.40
In/Out Flow Building	Pavers	2	8.00	130	0.42
Generator Building and Barge Pump Placement	Excavators	1	8.00	184	0.41
In/Out Flow Building	Paving Equipment	2	8.00	132	0.36
In/Out Flow Building	Rollers	2	8.00	80	0.38
Generator Building and Barge Pump Placement	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Building	Cranes	1	8.00	250	0.40
Generator Building and Barge Pump Placement	Off-Highway Trucks	1	1.00	230	0.48
Generator Building and Barge Pump Placement	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Crawler Tractors	1	8.00	165	0.38
In/Out Flow Grading/Dozing	Graders	1	8.00	200	0.41
In/Out Flow Grading/Dozing	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Grading/Dozing	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
In/Out Flow Excavation	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Building	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Generator Building and Barge Pump Plac	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Grading/Dozing	9	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6070	16.6496	9.4095	0.0371		0.5886	0.5886		0.5415	0.5415		3,586.5848	3,586.5848	1.1600		3,615.5842
Total	**1.6070**	**16.6496**	**9.4095**	**0.0371**		**0.5886**	**0.5886**		**0.5415**	**0.5415**		**3,586.5848**	**3,586.5848**	**1.1600**		**3,615.5842**

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0495	0.0260	0.3339	8.1000e-004	0.0822	5.4000e-004	0.0827	0.0218	4.9000e-004	0.0223		80.1709	80.1709	2.3300e-003		80.2291
Total	**0.0495**	**0.0260**	**0.3339**	**8.1000e-004**	**0.0822**	**5.4000e-004**	**0.0827**	**0.0218**	**4.9000e-004**	**0.0223**		**80.1709**	**80.1709**	**2.3300e-003**		**80.2291**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6070	16.6496	9.4095	0.0371		0.5886	0.5886		0.5415	0.5415	0.0000	3,586.5848	3,586.5848	1.1600		3,615.5842
Total	**1.6070**	**16.6496**	**9.4095**	**0.0371**		**0.5886**	**0.5886**		**0.5415**	**0.5415**	**0.0000**	**3,586.5848**	**3,586.5848**	**1.1600**		**3,615.5842**

3.2 In/Out Flow Excavation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0495	0.0260	0.3339	8.1000e-004	0.0822	5.4000e-004	0.0827	0.0218	4.9000e-004	0.0223		80.1709	80.1709	2.3300e-003		80.2291
Total	**0.0495**	**0.0260**	**0.3339**	**8.1000e-004**	**0.0822**	**5.4000e-004**	**0.0827**	**0.0218**	**4.9000e-004**	**0.0223**		**80.1709**	**80.1709**	**2.3300e-003**		**80.2291**

3.3 In/Out Flow Building - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4466	24.4864	24.0973	0.0540		1.0992	1.0992		1.0173	1.0173		5,220.7997	5,220.7997	1.6002		5,260.8057
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4466**	**24.4864**	**24.0973**	**0.0540**		**1.0992**	**1.0992**		**1.0173**	**1.0173**		**5,220.7997**	**5,220.7997**	**1.6002**		**5,260.8057**

3.3 In/Out Flow Building - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1144	0.0578	0.7587	1.9400e-003	0.2054	1.2900e-003	0.2067	0.0545	1.1900e-003	0.0557		193.3163	193.3163	5.1700e-003		193.4454
Total	**0.1144**	**0.0578**	**0.7587**	**1.9400e-003**	**0.2054**	**1.2900e-003**	**0.2067**	**0.0545**	**1.1900e-003**	**0.0557**		**193.3163**	**193.3163**	**5.1700e-003**		**193.4454**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4466	24.4864	24.0973	0.0540		1.0992	1.0992		1.0173	1.0173	0.0000	5,220.7997	5,220.7997	1.6002		5,260.8057
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4466**	**24.4864**	**24.0973**	**0.0540**		**1.0992**	**1.0992**		**1.0173**	**1.0173**	**0.0000**	**5,220.7997**	**5,220.7997**	**1.6002**		**5,260.8057**

3.3 In/Out Flow Building - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1144	0.0578	0.7587	1.9400e-003	0.2054	1.2900e-003	0.2067	0.0545	1.1900e-003	0.0557		193.3163	193.3163	5.1700e-003		193.4454
Total	**0.1144**	**0.0578**	**0.7587**	**1.9400e-003**	**0.2054**	**1.2900e-003**	**0.2067**	**0.0545**	**1.1900e-003**	**0.0557**		**193.3163**	**193.3163**	**5.1700e-003**		**193.4454**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.5070	37.6753	24.3650	0.0603		1.5387	1.5387		1.4219	1.4219		5,832.5091	5,832.5091	1.7934		5,877.3449
Total	**3.5070**	**37.6753**	**24.3650**	**0.0603**	**8.6733**	**1.5387**	**10.2120**	**3.5965**	**1.4219**	**5.0184**		**5,832.5091**	**5,832.5091**	**1.7934**		**5,877.3449**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0915	0.0463	0.6069	1.5500e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		154.6530	154.6530	4.1300e-003		154.7563
Total	**0.0915**	**0.0463**	**0.6069**	**1.5500e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**154.6530**	**154.6530**	**4.1300e-003**		**154.7563**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026			0.0000			0.0000
Off-Road	3.5070	37.6753	24.3650	0.0603		1.5387	1.5387		1.4219	1.4219	0.0000	5,832.5091	5,832.5091	1.7934		5,877.3449
Total	**3.5070**	**37.6753**	**24.3650**	**0.0603**	**3.3826**	**1.5387**	**4.9213**	**1.4026**	**1.4219**	**2.8246**	**0.0000**	**5,832.5091**	**5,832.5091**	**1.7934**		**5,877.3449**

3.4 Generator Building and Barge Pump Placement - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0915	0.0463	0.6069	1.5500e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		154.6530	154.6530	4.1300e-003		154.7563
Total	**0.0915**	**0.0463**	**0.6069**	**1.5500e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**154.6530**	**154.6530**	**4.1300e-003**		**154.7563**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7043	51.6715	34.6614	0.0679		2.2688	2.2688		2.0873	2.0873		6,572.9681	6,572.9681	2.1258		6,626.1139
Total	**4.7043**	**51.6715**	**34.6614**	**0.0679**	**8.6733**	**2.2688**	**10.9422**	**3.5965**	**2.0873**	**5.6838**		**6,572.9681**	**6,572.9681**	**2.1258**		**6,626.1139**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0248	0.0130	0.1670	4.0000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		40.0855	40.0855	1.1600e-003		40.1145
Total	**0.0248**	**0.0130**	**0.1670**	**4.0000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**40.0855**	**40.0855**	**1.1600e-003**		**40.1145**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026			0.0000			0.0000
Off-Road	4.7043	51.6715	34.6614	0.0679		2.2688	2.2688		2.0873	2.0873	0.0000	6,572.9681	6,572.9681	2.1258		6,626.1139
Total	**4.7043**	**51.6715**	**34.6614**	**0.0679**	**3.3826**	**2.2688**	**5.6514**	**1.4026**	**2.0873**	**3.4900**	**0.0000**	**6,572.9681**	**6,572.9681**	**2.1258**		**6,626.1139**

3.5 In/Out Flow Grading/Dozing - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0248	0.0130	0.1670	4.0000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		40.0855	40.0855	1.1600e-003		40.1145
Total	**0.0248**	**0.0130**	**0.1670**	**4.0000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**40.0855**	**40.0855**	**1.1600e-003**		**40.1145**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.533627	0.031932	0.174885	0.126979	0.018773	0.004811	0.020615	0.079394	0.001826	0.001217	0.004186	0.001092	0.000663

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

McKay Point Reservoir Project Construction

Tulare County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	200.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	51
Climate Zone	7			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

McKay Point Reservoir Project Construction - Tulare County, Winter

Project Characteristics -

Land Use - The Owners propose to develop approximately 200 acres within the 500 acre McKay Point property.

Construction Phase - Construction timeline and activity levels based on Provost & Pritchard Consulting Group communication dated 3/18/2015 (Appendix B of Air Quality Report).

Off-road Equipment - Operational days conservatively based on equipment with longest construction timeline.

Off-road Equipment - See Appendix B

Off-road Equipment - See Appendix B

Road Dust - Site roads are conservatively assumed to be un-paved.

Construction Off-road Equipment Mitigation -

Operational Off-Road Equipment -

Off-road Equipment - See Appendix B
In/Out Flow Grading/Dozing is separated from In/Out-Flow Excavation in CalEEMod model but sourced from the same table of Provost & Pritchard Consulting Memo.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	310.00	1.00
tblConstructionPhase	NumDays	310.00	6.00
tblConstructionPhase	NumDays	220.00	10.00
tblConstructionPhase	PhaseEndDate	2/4/2022	7/19/2021
tblConstructionPhase	PhaseEndDate	9/29/2023	8/1/2022
tblConstructionPhase	PhaseEndDate	7/22/2022	2/18/2022
tblGrading	AcresOfGrading	3.00	2.50
tblLandUse	LotAcreage	0.00	200.00
tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	231.00	250.00

tblOffRoadEquipment	HorsePower	402.00	230.00
tblOffRoadEquipment	HorsePower	158.00	184.00
tblOffRoadEquipment	HorsePower	97.00	408.00
tblOffRoadEquipment	HorsePower	212.00	530.00
tblOffRoadEquipment	HorsePower	212.00	165.00
tblOffRoadEquipment	HorsePower	187.00	200.00
tblOffRoadEquipment	LoadFactor	0.38	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.73
tblOffRoadEquipment	LoadFactor	0.37	0.38
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.74	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.29	0.40
tblOffRoadEquipment	LoadFactor	0.38	0.48
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.37	0.36
tblOffRoadEquipment	LoadFactor	0.74	0.38
tblOffRoadEquipment	LoadFactor	0.43	0.29
tblOffRoadEquipment	LoadFactor	0.43	0.38
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Concrete/Industrial Saws	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType	Rubber Tired Dozers	Cranes
tblOffRoadEquipment	OffRoadEquipmentType	Scrapers	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType	Pavers	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Paving Equipment	Tractors/Loaders/Backhoes

tblOffRoadEquipment	OffRoadEquipmentType	Rollers	Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType	Excavators	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblRoadDust	RoadPercentPave	100	0
tblTripsAndVMT	WorkerTripNumber	23.00	5.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.3800	68.3669	44.4922	0.1060	8.7966	2.8582	11.6548	3.6292	2.6296	6.2588	0.0000	10,264.8067	10,264.8067	3.2889	0.0000	10,347.0281
2022	3.5916	37.7296	24.8735	0.0617	8.8376	1.5397	10.3774	3.6401	1.4229	5.0630	0.0000	5,967.8734	5,967.8734	1.7970	0.0000	6,012.7995
Maximum	**6.3800**	**68.3669**	**44.4922**	**0.1060**	**8.8376**	**2.8582**	**11.6548**	**3.6401**	**2.6296**	**6.2588**	**0.0000**	**10,264.8067**	**10,264.8067**	**3.2889**	**0.0000**	**10,347.0281**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	6.3800	68.3669	44.4922	0.1060	3.5058	2.8582	6.3640	1.4353	2.6296	4.0649	0.0000	10,264.8067	10,264.8067	3.2889	0.0000	10,347.0281
2022	3.5916	37.7296	24.8735	0.0617	3.5469	1.5397	5.0866	1.4462	1.4229	2.8691	0.0000	5,967.8734	5,967.8734	1.7970	0.0000	6,012.7995
Maximum	**6.3800**	**68.3669**	**44.4922**	**0.1060**	**3.5469**	**2.8582**	**6.3640**	**1.4462**	**2.6296**	**4.0649**	**0.0000**	**10,264.8067**	**10,264.8067**	**3.2889**	**0.0000**	**10,347.0281**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**60.01**	**0.00**	**48.03**	**60.36**	**0.00**	**38.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	In/Out Flow Excavation	Trenching	5/1/2021	7/19/2021	5	56	
2	In/Out Flow Building	Paving	2/5/2022	2/18/2022	5	10	
3	Generator Building and Barge Pump Placement	Grading	7/23/2022	8/1/2022	5	6	
4	In/Out Flow Grading/Dozing	Grading	5/5/2021	5/5/2021	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

McKay Point Reservoir Project Construction - Tulare County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
In/Out Flow Building	Excavators	1	8.00	184	0.42
In/Out Flow Excavation	Off-Highway Trucks	1	2.00	230	0.38
In/Out Flow Excavation	Excavators	1	8.00	184	0.73
Generator Building and Barge Pump Placement	Tractors/Loaders/Backhoes	1	8.00	108	0.38
In/Out Flow Building	Tractors/Loaders/Backhoes	1	8.00	408	0.36
In/Out Flow Building	Generator Sets	1	8.00	84	0.38
In/Out Flow Excavation	Crawler Tractors	1	8.00	530	0.29
In/Out Flow Grading/Dozing	Excavators	2	8.00	158	0.38
Generator Building and Barge Pump Placement	Graders	1	8.00	187	0.41
In/Out Flow Excavation	Off-Highway Trucks	1	8.00	300	0.40
Generator Building and Barge Pump Placement	Generator Sets	1	8.00	84	0.40
In/Out Flow Building	Pavers	2	8.00	130	0.42
Generator Building and Barge Pump Placement	Excavators	1	8.00	184	0.41
In/Out Flow Building	Paving Equipment	2	8.00	132	0.36
In/Out Flow Building	Rollers	2	8.00	80	0.38
Generator Building and Barge Pump Placement	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Building	Cranes	1	8.00	250	0.40
Generator Building and Barge Pump Placement	Off-Highway Trucks	1	1.00	230	0.48
Generator Building and Barge Pump Placement	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Crawler Tractors	1	8.00	165	0.38
In/Out Flow Grading/Dozing	Graders	1	8.00	200	0.41
In/Out Flow Grading/Dozing	Rubber Tired Dozers	1	8.00	247	0.40
In/Out Flow Grading/Dozing	Scrapers	2	8.00	367	0.48
In/Out Flow Grading/Dozing	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
In/Out Flow Excavation	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Building	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Generator Building and Barge Pump Plac	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
In/Out Flow Grading/Dozing	9	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6070	16.6496	9.4095	0.0371		0.5886	0.5886		0.5415	0.5415		3,586.5848	3,586.5848	1.1600		3,615.5842
Total	**1.6070**	**16.6496**	**9.4095**	**0.0371**		**0.5886**	**0.5886**		**0.5415**	**0.5415**		**3,586.5848**	**3,586.5848**	**1.1600**		**3,615.5842**

3.2 In/Out Flow Excavation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0458	0.0305	0.2809	7.0000e-004	0.0822	5.4000e-004	0.0827	0.0218	4.9000e-004	0.0223		70.1692	70.1692	2.0400e-003		70.2201
Total	**0.0458**	**0.0305**	**0.2809**	**7.0000e-004**	**0.0822**	**5.4000e-004**	**0.0827**	**0.0218**	**4.9000e-004**	**0.0223**		**70.1692**	**70.1692**	**2.0400e-003**		**70.2201**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6070	16.6496	9.4095	0.0371		0.5886	0.5886		0.5415	0.5415	0.0000	3,586.5848	3,586.5848	1.1600		3,615.5842
Total	**1.6070**	**16.6496**	**9.4095**	**0.0371**		**0.5886**	**0.5886**		**0.5415**	**0.5415**	**0.0000**	**3,586.5848**	**3,586.5848**	**1.1600**		**3,615.5842**

3.2 In/Out Flow Excavation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0458	0.0305	0.2809	7.0000e-004	0.0822	5.4000e-004	0.0827	0.0218	4.9000e-004	0.0223		70.1692	70.1692	2.0400e-003		70.2201
Total	**0.0458**	**0.0305**	**0.2809**	**7.0000e-004**	**0.0822**	**5.4000e-004**	**0.0827**	**0.0218**	**4.9000e-004**	**0.0223**		**70.1692**	**70.1692**	**2.0400e-003**		**70.2201**

3.3 In/Out Flow Building - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4466	24.4864	24.0973	0.0540		1.0992	1.0992		1.0173	1.0173		5,220.7997	5,220.7997	1.6002		5,260.8057
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4466**	**24.4864**	**24.0973**	**0.0540**		**1.0992**	**1.0992**		**1.0173**	**1.0173**		**5,220.7997**	**5,220.7997**	**1.6002**		**5,260.8057**

3.3 In/Out Flow Building - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1058	0.0679	0.6356	1.7000e-003	0.2054	1.2900e-003	0.2067	0.0545	1.1900e-003	0.0557		169.2054	169.2054	4.5200e-003		169.3183
Total	**0.1058**	**0.0679**	**0.6356**	**1.7000e-003**	**0.2054**	**1.2900e-003**	**0.2067**	**0.0545**	**1.1900e-003**	**0.0557**		**169.2054**	**169.2054**	**4.5200e-003**		**169.3183**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.4466	24.4864	24.0973	0.0540		1.0992	1.0992		1.0173	1.0173	0.0000	5,220.7997	5,220.7997	1.6002		5,260.8057
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4466**	**24.4864**	**24.0973**	**0.0540**		**1.0992**	**1.0992**		**1.0173**	**1.0173**	**0.0000**	**5,220.7997**	**5,220.7997**	**1.6002**		**5,260.8057**

3.3 In/Out Flow Building - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1058	0.0679	0.6356	1.7000e-003	0.2054	1.2900e-003	0.2067	0.0545	1.1900e-003	0.0557		169.2054	169.2054	4.5200e-003		169.3183
Total	**0.1058**	**0.0679**	**0.6356**	**1.7000e-003**	**0.2054**	**1.2900e-003**	**0.2067**	**0.0545**	**1.1900e-003**	**0.0557**		**169.2054**	**169.2054**	**4.5200e-003**		**169.3183**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	3.5070	37.6753	24.3650	0.0603		1.5387	1.5387		1.4219	1.4219		5,832.5091	5,832.5091	1.7934		5,877.3449
Total	**3.5070**	**37.6753**	**24.3650**	**0.0603**	**8.6733**	**1.5387**	**10.2120**	**3.5965**	**1.4219**	**5.0184**		**5,832.5091**	**5,832.5091**	**1.7934**		**5,877.3449**

3.4 Generator Building and Barge Pump Placement - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0846	0.0543	0.5085	1.3600e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		135.3643	135.3643	3.6100e-003		135.4546
Total	**0.0846**	**0.0543**	**0.5085**	**1.3600e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**135.3643**	**135.3643**	**3.6100e-003**		**135.4546**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026			0.0000			0.0000
Off-Road	3.5070	37.6753	24.3650	0.0603		1.5387	1.5387		1.4219	1.4219	0.0000	5,832.5091	5,832.5091	1.7934		5,877.3449
Total	**3.5070**	**37.6753**	**24.3650**	**0.0603**	**3.3826**	**1.5387**	**4.9213**	**1.4026**	**1.4219**	**2.8246**	**0.0000**	**5,832.5091**	**5,832.5091**	**1.7934**		**5,877.3449**

3.4 Generator Building and Barge Pump Placement - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0846	0.0543	0.5085	1.3600e-003	0.1643	1.0300e-003	0.1653	0.0436	9.5000e-004	0.0445		135.3643	135.3643	3.6100e-003		135.4546
Total	**0.0846**	**0.0543**	**0.5085**	**1.3600e-003**	**0.1643**	**1.0300e-003**	**0.1653**	**0.0436**	**9.5000e-004**	**0.0445**		**135.3643**	**135.3643**	**3.6100e-003**		**135.4546**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.7043	51.6715	34.6614	0.0679		2.2688	2.2688		2.0873	2.0873		6,572.9681	6,572.9681	2.1258		6,626.1139
Total	**4.7043**	**51.6715**	**34.6614**	**0.0679**	**8.6733**	**2.2688**	**10.9422**	**3.5965**	**2.0873**	**5.6838**		**6,572.9681**	**6,572.9681**	**2.1258**		**6,626.1139**

3.5 In/Out Flow Grading/Dozing - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0229	0.0153	0.1404	3.5000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		35.0846	35.0846	1.0200e-003		35.1100
Total	**0.0229**	**0.0153**	**0.1404**	**3.5000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**35.0846**	**35.0846**	**1.0200e-003**		**35.1100**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026			0.0000			0.0000
Off-Road	4.7043	51.6715	34.6614	0.0679		2.2688	2.2688		2.0873	2.0873	0.0000	6,572.9681	6,572.9681	2.1258		6,626.1139
Total	**4.7043**	**51.6715**	**34.6614**	**0.0679**	**3.3826**	**2.2688**	**5.6514**	**1.4026**	**2.0873**	**3.4900**	**0.0000**	**6,572.9681**	**6,572.9681**	**2.1258**		**6,626.1139**

3.5 In/Out Flow Grading/Dozing - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0229	0.0153	0.1404	3.5000e-004	0.0411	2.7000e-004	0.0413	0.0109	2.5000e-004	0.0111		35.0846	35.0846	1.0200e-003		35.1100
Total	**0.0229**	**0.0153**	**0.1404**	**3.5000e-004**	**0.0411**	**2.7000e-004**	**0.0413**	**0.0109**	**2.5000e-004**	**0.0111**		**35.0846**	**35.0846**	**1.0200e-003**		**35.1100**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.533627	0.031932	0.174885	0.126979	0.018773	0.004811	0.020615	0.079394	0.001826	0.001217	0.004186	0.001092	0.000663

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**2.2000e-004**	**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX E

HRA Results

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
1	313947	4027649	-7.1028E-08	-5.0067E-07	-5.71698E-07	-0.571698	0.01988	0.0045986	0.01988	-2.9348E-08	0.0017394
2	314199	4027649	-7.2348E-08	-5.3461E-07	-6.06958E-07	-0.606958	0.023697	0.0049116	0.023697	-3.019E-08	0.0018644
3	314450	4027649	-1.1977E-07	-6.7794E-07	-7.9771E-07	-0.79771	0.024248	0.0034089	0.024248	-4.4927E-08	0.0012483
4	314702	4027649	-1.9666E-07	-9.2235E-07	-1.11901E-06	-1.11901	0.019847	0.0012145	0.019847	-6.9332E-08	0.00040206
5	314954	4027649	-2.3603E-07	-1.0876E-06	-1.32363E-06	-1.32363	0.028504	0.00071963	0.028504	-8.2551E-08	0.00023848
6	315205	4027649	-2.5322E-07	-1.1875E-06	-1.44072E-06	-1.44072	0.020873	0.0012268	0.020873	-8.9001E-08	0.00040646
7	315457	4027649	-2.422E-07	-1.2421E-06	-1.4843E-06	-1.4843	0.042755	0.0030725	0.042755	-8.6919E-08	0.0010581
8	315708	4027649	-3.2376E-07	-1.4598E-06	-1.78356E-06	-1.78356	0.045476	0.00069007	0.045476	-1.1288E-07	0.0002281
9	315960	4027649	-2.7928E-07	-1.5169E-06	-1.79618E-06	-1.79618	0.042821	0.0053875	0.042821	-1.0217E-07	0.0019444
10	316212	4027649	-3.1699E-07	-1.6572E-06	-1.97419E-06	-1.97419	0.039781	0.0059261	0.039781	-1.155E-07	0.0021221
11	316463	4027649	-2.8613E-07	-1.6438E-06	-1.92993E-06	-1.92993	0.03665	0.0095135	0.03665	-1.0849E-07	0.0035424
12	316715	4027649	-1.2019E-07	-0.00000139	-1.51019E-06	-1.51019	0.053914	0.019836	0.053914	-6.2345E-08	0.0076682
13	316966	4027649	-4.0524E-08	-0.000001197	-1.23752E-06	-1.237524	0.060757	0.02568	0.060757	-4.0693E-08	0.0099915
14	317218	4027649	9.4936E-08	-8.2751E-07	-7.32574E-07	-0.732574	0.057314	0.033161	0.057314	-1.3811E-09	0.012975
15	317469	4027649	2.8401E-07	-4.0062E-07	-1.1661E-07	-0.11661	0.040271	0.044106	0.040271	5.2566E-08	0.017342
16	317721	4027649	3.6171E-07	-1.942E-07	1.6751E-07	0.16751	0.050492	0.049738	0.050492	7.387E-08	0.019551
17	317973	4027649	5.0552E-07	1.2111E-07	6.2663E-07	0.62663	0.044046	0.056682	0.044046	1.1605E-07	0.02233
18	318224	4027649	4.6176E-07	1.3471E-07	5.9647E-07	0.59647	0.053873	0.052368	0.053873	1.0562E-07	0.020613
19	318476	4027649	3.7541E-07	5.1921E-08	4.27331E-07	0.427331	0.047228	0.04512	0.047228	8.3442E-08	0.017747
20	318727	4027649	3.7546E-07	1.1227E-07	4.8773E-07	0.48773	0.043865	0.042411	0.043865	8.6109E-08	0.016677
21	318979	4027649	3.2124E-07	7.6671E-08	3.97911E-07	0.397911	0.029872	0.037331	0.029872	7.2704E-08	0.014682
22	313947	4027807	-9.116E-08	-5.6802E-07	-6.5918E-07	-0.65918	0.015634	0.0043791	0.015634	-3.6016E-08	0.0016403
23	314199	4027807	-9.1456E-08	-6.1456E-07	-7.06016E-07	-0.706016	0.02302	0.0050031	0.02302	-3.6847E-08	0.0018855
24	314450	4027807	-1.1589E-07	-7.3313E-07	-8.4902E-07	-0.84902	0.025322	0.0046846	0.025322	-4.4987E-08	0.0017477
25	314702	4027807	-2.1005E-07	-1.0229E-06	-1.23295E-06	-1.23295	0.027835	0.0016957	0.027835	-7.4463E-08	0.00056187
26	314954	4027807	-2.7508E-07	-1.2389E-06	-1.51398E-06	-1.51398	0.02138	0.00026593	0.02138	-9.5648E-08	0.000088084
27	315205	4027807	-3.0391E-07	-1.3862E-06	-1.69011E-06	-1.69011	0.034497	0.0004017	0.034497	-1.0579E-07	0.00013293
28	315457	4027807	-2.9003E-07	-1.4638E-06	-1.75383E-06	-1.75383	0.047249	0.0029038	0.047249	-1.034E-07	0.00096179
29	315708	4027807	-3.9353E-07	-1.7361E-06	-2.12963E-06	-2.12963	0.021311	0	0.021311	-1.3628E-07	0
30	315960	4027807	-3.508E-07	-0.000001813	-2.1638E-06	-2.1638	0.047237	0.0046926	0.047237	-1.2614E-07	0.0016326
31	316212	4027807	-3.6898E-07	-1.9124E-06	-2.28138E-06	-2.28138	0.030758	0.00694	0.030758	-1.3443E-07	0.0024865
32	316463	4027807	-2.9634E-07	-1.8137E-06	-2.11004E-06	-2.11004	0.050251	0.012641	0.050251	-1.1527E-07	0.0047613
33	316715	4027807	-7.7807E-08	-1.4442E-06	-1.52201E-06	-1.522007	0.063261	0.02619	0.063261	-5.4324E-08	0.010175
34	316966	4027807	3.4716E-08	-1.1293E-06	-1.09458E-06	-1.094584	0.06651	0.033768	0.06651	-2.2893E-08	0.013184
35	317218	4027807	2.4061E-07	-6.1714E-07	-3.7653E-07	-0.37653	0.066697	0.044931	0.066697	3.6794E-08	0.01764
36	317469	4027807	4.5155E-07	-1.7109E-07	2.8046E-07	0.28046	0.06293	0.058061	0.06293	9.6015E-08	0.022861
37	317721	4027807	5.611E-07	1.1204E-07	6.7314E-07	0.67314	0.056942	0.064675	0.056942	1.2716E-07	0.025469
38	317973	4027807	6.5917E-07	3.7073E-07	1.0299E-06	1.0299	0.063603	0.067926	0.063603	1.5741E-07	0.02678
39	318224	4027807	5.039E-07	2.0166E-07	7.0556E-07	0.70556	0.058278	0.057088	0.058278	1.1555E-07	0.022468
40	318476	4027807	4.8307E-07	2.4084E-07	7.2391E-07	0.72391	0.051494	0.052449	0.051494	1.1302E-07	0.02064
41	318727	4027807	4.3293E-07	2.2654E-07	6.5947E-07	0.65947	0.041856	0.046715	0.041856	1.0165E-07	0.018389
42	318979	4027807	3.7083E-07	1.6175E-07	5.3258E-07	0.53258	0.040481	0.040825	0.040481	8.6228E-08	0.016088
43	313947	4027966	-1.1397E-07	-6.433E-07	-7.5727E-07	-0.75727	0.00891	0.0039924	0.00891	-4.3449E-08	0.0014758
44	314199	4027966	-1.2632E-07	-7.2772E-07	-8.5404E-07	-0.85404	0.017213	0.0043953	0.017213	-4.8187E-08	0.0016253
45	314450	4027966	-1.4353E-07	-8.4647E-07	-0.00000099	-0.99	0.025295	0.0046635	0.025295	-5.4475E-08	0.0017195
46	314702	4027966	-2.1848E-07	-1.1382E-06	-1.35668E-06	-1.35668	0.030575	0.0027988	0.030575	-7.8496E-08	0.00095439
47	314954	4027966	-3.0415E-07	-1.4006E-06	-1.70475E-06	-1.70475	0.031095	0.0005877	0.031095	-1.0606E-07	0.00019506
48	315205	4027966	-3.6745E-07	-1.6364E-06	-2.00385E-06	-2.00385	0.042433	0	0.042433	-1.2711E-07	0
49	315457	4027966	-3.9491E-07	-1.8007E-06	-2.19561E-06	-2.19561	0.042414	0.00035478	0.042414	-1.3727E-07	0.00011666
50	315708	4027966	-4.2093E-07	-1.9957E-06	-2.41663E-06	-2.41663	0.054807	0.0016647	0.054807	-1.4759E-07	0.00055142
51	315960	4027966	-4.6248E-07	-2.2019E-06	-2.66438E-06	-2.66438	0.058256	0.0025426	0.058256	-1.6281E-07	0.00084261
52	316212	4027966	-3.9958E-07	-2.1538E-06	-2.55338E-06	-2.55338	0.06451	0.0094831	0.06451	-1.4767E-07	0.0034621
53	316463	4027966	-2.9755E-07	-0.000001996	-2.29355E-06	-2.29355	0.065413	0.017319	0.065413	-1.2053E-07	0.0065902
54	316715	4027966	1.1761E-08	-1.4036E-06	-1.39184E-06	-1.391839	0.074925	0.035773	0.074925	-3.3303E-08	0.013965
55	316966	4027966	1.5244E-07	-9.754E-07	-8.2296E-07	-0.82296	0.079201	0.044908	0.079201	6.474E-09	0.01759
56	317218	4027966	4.326E-07	-3.3601E-07	9.659E-08	0.09659	0.054873	0.060052	0.054873	8.7432E-08	0.023629
57	317469	4027966	6.4282E-07	1.2052E-07	7.6334E-07	0.76334	0.068225	0.074171	0.068225	1.4555E-07	0.029226
58	317721	4027966	8.2922E-07	5.4767E-07	1.37689E-06	1.37689	0.056518	0.083248	0.056518	2.0024E-07	0.032843
59	317973	4027966	7.1209E-07	4.7326E-07	1.18535E-06	1.18535	0.064847	0.07438	0.064847	1.6954E-07	0.029298
60	318224	4027966	6.2947E-07	4.2396E-07	1.05343E-06	1.05343	0.055459	0.06607	0.055459	1.4967E-07	0.026018
61	318476	4027966	5.839E-07	4.3987E-07	1.02377E-06	1.02377	0.055949	0.059177	0.055949	1.4099E-07	0.023313
62	318727	4027966	4.976E-07	3.3204E-07	8.2964E-07	0.82964	0.050765	0.051594	0.050765	1.1896E-07	0.020347
63	318979	4027966	3.4296E-07	9.9135E-08	4.42095E-07	0.442095	0.039583	0.039905	0.039583	7.7702E-08	0.015718
64	313947	4028124	-1.2591E-07	-7.0847E-07	-8.3438E-07	-0.83438	0.018357	0.0040806	0.018357	-4.7699E-08	0.0015012
65	314199	4028124	-1.6077E-07	-8.4946E-07	-1.01023E-06	-1.01023	0.013133	0.0038026	0.013133	-5.9448E-08	0.0013738
66	314450	4028124	-1.9755E-07	-1.0177E-06	-1.21525E-06	-1.21525	0.019029	0.0035159	0.019029	-7.1849E-08	0.0012389
67	314702	4028124	-2.6778E-07	-1.3374E-06	-1.60518E-06	-1.60518	0.032313	0.0023935	0.032313	-9.5181E-08	0.00079377
68	314954	4028124	-3.2444E-07	-1.5908E-06	-1.91524E-06	-1.91524	0.037953	0.0018742	0.037953	-1.1439E-07	0.00062213
69	315205	4028124	-4.4041E-07	-1.9521E-06	-2.39251E-06	-2.39251	0.045448	0	0.045448	-1.5197E-07	0
70	315457	4028124	-4.8793E-07	-2.1774E-06	-2.66533E-06	-2.66533	0.05471	0	0.05471	-1.6865E-07	0
71	315708	4028124	-5.0613E-07	-2.4175E-06	-2.92363E-06	-2.92363	0.066196	0.0017174	0.066196	-1.7723E-07	0.00056909
72	315960	4028124	-5.9681E-07	-2.6636E-06	-3.26041E-06	-3.26041	0.067251	0.00032303	0.067251	-2.072E-07	0.00010664
73	316212	4028124	-4.0476E-07	-2.4092E-06	-2.81396E-06	-2.81396	0.076692	0.014481	0.076692	-1.548E-07	0.0054164
74	316463	4028124	-2.7086E-07	-2.1397E-06	-2.41056E-06	-2.41056	0.078739	0.024368	0.078739	-1.1859E-07	0.0093623
75	316715	4028124	1.741E-07	-0.000001218	-1.0439E-06	-1.0439	0.088911	0.05032	0.088911	7.762E-09	0.01973
76	316966	4028124	3.4236E-07	-7.1432E-07	-3.7196E-07	-0.37196	0.081679	0.061837	0.081679	5.4789E-08	0.024274
77	317218	4028124	7.5018E-07	1.449E-07	8.9508E-07	0.89508	0.065359	0.084998	0.065359	1.7127E-07	0.033519

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
78	317469	4028124	9.3592E-07	5.9546E-07	1.53138E-06	1.53138	0.07527	0.096324	0.07527	2.2381E-07	0.037996
79	317721	4028124	1.0493E-06	9.304E-07	1.9797E-06	1.9797	0.070562	0.099644	0.070562	2.5937E-07	0.039308
80	317973	4028124	8.6212E-07	7.5345E-07	1.61557E-06	1.61557	0.074024	0.08588	0.074024	2.0971E-07	0.033851
81	318224	4028124	7.9725E-07	7.4945E-07	1.5467E-06	1.5467	0.066609	0.076727	0.066609	1.9662E-07	0.030247
82	318476	4028124	6.7088E-07	5.893E-07	1.26018E-06	1.26018	0.060433	0.065519	0.060433	1.6451E-07	0.025859
83	318727	4028124	4.6253E-07	2.4328E-07	7.0581E-07	0.70581	0.053943	0.050978	0.053943	1.0771E-07	0.020092
84	318979	4028124	3.4758E-07	5.5579E-08	4.03159E-07	0.403159	0.046087	0.041287	0.046087	7.7844E-08	0.016261
85	313947	4028282	-1.4128E-07	-7.8727E-07	-9.2855E-07	-0.92855	0.017749	0.0039618	0.017749	-5.2942E-08	0.0014462
86	314199	4028282	-1.9022E-07	-9.7626E-07	-1.16648E-06	-1.16648	0.025655	0.003452	0.025655	-6.9299E-08	0.0012162
87	314450	4028282	-2.5066E-07	-1.2197E-06	-1.47036E-06	-1.47036	0.025308	0.0025937	0.025308	-8.939E-08	0.00085943
88	314702	4028282	-3.6073E-07	-1.6395E-06	-2.00023E-06	-2.00023	0.020472	0.00028494	0.020472	-1.2534E-07	0.000094526
89	314954	4028282	-4.1132E-07	-1.9335E-06	-2.34482E-06	-2.34482	0.039428	0.00071732	0.039428	-1.434E-07	0.00023886
90	315205	4028282	-5.0037E-07	-2.3198E-06	-2.82017E-06	-2.82017	0.053028	0	0.053028	-1.733E-07	0
91	315457	4028282	-6.1953E-07	-2.7068E-06	-3.32633E-06	-3.32633	0.049604	0	0.049604	-2.1314E-07	0
92	315708	4028282	-6.857E-07	-3.0456E-06	-3.7313E-06	-3.7313	0.074376	0	0.074376	-2.367E-07	0
93	315960	4028282	-6.4862E-07	-3.0553E-06	-3.70392E-06	-3.70392	0.063976	0.0033437	0.063976	-2.2814E-07	0.0011079
94	316212	4028282	-4.0819E-07	-2.6966E-06	-3.10479E-06	-3.10479	0.074808	0.020684	0.074808	-1.6253E-07	0.0078479
95	316463	4028282	-1.7808E-07	-0.00000215	-2.32808E-06	-2.32808	0.080374	0.036468	0.080374	-9.8944E-08	0.01414
96	316715	4028282	4.3817E-07	-8.553E-07	-4.1713E-07	-0.41713	0.10437	0.072346	0.10437	7.6242E-08	0.028467
97	316966	4028282	6.9879E-07	-1.7653E-07	5.2226E-07	0.52226	0.10305	0.090405	0.10305	1.4835E-07	0.035578
98	317218	4028282	1.2096E-06	8.8762E-07	2.09722E-06	2.09722	0.10481	0.11884	0.10481	2.947E-07	0.046954
99	317469	4028282	1.3719E-06	1.3414E-06	2.7133E-06	2.7133	0.063114	0.1248	0.063114	3.443E-07	0.049285
100	317721	4028282	1.0842E-06	1.0793E-06	2.1635E-06	2.1635	0.06563	0.10353	0.06563	2.6808E-07	0.040823
101	317973	4028282	1.0745E-06	0.000001166	2.2405E-06	2.2405	0.063902	0.099273	0.063902	2.6914E-07	0.039155
102	318224	4028282	9.2189E-07	9.7952E-07	1.90141E-06	1.90141	0.071924	0.085131	0.071924	2.3105E-07	0.033626
103	318476	4028282	6.2437E-07	4.665E-07	1.09087E-06	1.09087	0.063664	0.065049	0.063664	1.4925E-07	0.025657
104	318727	4028282	4.924E-07	2.4538E-07	7.3778E-07	0.73778	0.056829	0.053671	0.056829	1.1514E-07	0.021166
105	318979	4028282	4.4822E-07	1.9358E-07	6.418E-07	0.6418	0.052011	0.047891	0.052011	1.0547E-07	0.018898
106	313947	4028440	-1.2827E-07	-8.4722E-07	-9.7549E-07	-0.97549	0.020249	0.0058576	0.020249	-5.058E-08	0.0021958
107	314199	4028440	-2.0341E-07	-1.0997E-06	-1.30311E-06	-1.30311	0.025933	0.0041573	0.025933	-7.4734E-08	0.0014806
108	314450	4028440	-3.141E-07	-1.4798E-06	-1.7939E-06	-1.7939	0.032117	0.0016082	0.032117	-1.1045E-07	0.00053304
109	314702	4028440	-4.5178E-07	-2.0006E-06	-2.45238E-06	-2.45238	0.032857	0	0.032857	-1.5594E-07	0
110	314954	4028440	-5.7383E-07	-2.4924E-06	-3.06623E-06	-3.06623	0.020714	0	0.020714	-1.972E-07	0
111	315205	4028440	-6.556E-07	-2.9421E-06	-3.5977E-06	-3.5977	0.054399	0	0.054399	-2.2582E-07	0
112	315457	4028440	-7.4203E-07	-0.000003357	-4.09903E-06	-4.09903	0.067155	0	0.067155	-2.5573E-07	0
113	315708	4028440	-8.4535E-07	-3.7126E-06	-4.55795E-06	-4.55795	0.082149	0	0.082149	-2.9123E-07	0
114	315960	4028440	-6.8773E-07	-3.5229E-06	-4.21063E-06	-4.21063	0.099189	0.0089578	0.099189	-2.4717E-07	0.003116
115	316212	4028440	-4.6876E-07	-3.0762E-06	-3.54496E-06	-3.54496	0.11124	0.025743	0.11124	-1.8832E-07	0.009804
116	316463	4028440	1.1112E-08	-0.000001973	-1.96189E-06	-1.961888	0.12131	0.05618	0.12131	-5.3685E-08	0.021939
117	316715	4028440	8.786E-07	-1.9639E-07	6.8221E-07	0.68221	0.12049	0.10769	0.12049	1.9182E-07	0.04247
118	316966	4028440	1.3306E-06	8.2509E-07	2.15569E-06	2.15569	0.12553	0.13722	0.12553	3.1777E-07	0.054162
119	317218	4028440	1.8173E-06	1.9183E-06	3.7356E-06	3.7356	0.093447	0.16282	0.093447	4.589E-07	0.064363
120	317469	4028440	1.4825E-06	1.6665E-06	0.000003149	3.149	0.053318	0.13241	0.053318	3.7517E-07	0.052259
121	317721	4028440	9.0991E-07	1.0354E-06	1.94531E-06	1.94531	0.021593	0.081593	0.021593	2.302E-07	0.032222
122	317973	4028440	1.0219E-06	1.1601E-06	0.000002182	2.182	0.042722	0.092311	0.042722	2.5814E-07	0.036469
123	318224	4028440	8.6579E-07	8.464E-07	1.71219E-06	1.71219	0.064751	0.084445	0.064751	2.128E-07	0.033341
124	318476	4028440	7.2869E-07	6.0342E-07	1.33211E-06	1.33211	0.067682	0.072114	0.067682	1.777E-07	0.028484
125	318727	4028440	6.1842E-07	4.5417E-07	1.07259E-06	1.07259	0.063033	0.061642	0.063033	1.5017E-07	0.024352
126	318979	4028440	4.7223E-07	2.6527E-07	7.375E-07	0.7375	0.055679	0.05062	0.055679	1.1124E-07	0.019977
127	313947	4028599	-1.5291E-07	-9.7632E-07	-1.12923E-06	-1.12923	0.021478	0.0066341	0.021478	-5.9842E-08	0.0024762
128	314199	4028599	-2.1718E-07	-1.2531E-06	-1.47028E-06	-1.47028	0.02797	0.0055328	0.02797	-8.1037E-08	0.0020086
129	314450	4028599	-3.5571E-07	-1.7644E-06	-2.12011E-06	-2.12011	0.030856	0.0022746	0.030856	-1.2561E-07	0.00075536
130	314702	4028599	-5.5041E-07	-2.4563E-06	-3.00671E-06	-3.00671	0.03674	0	0.03674	-1.8966E-07	0
131	314954	4028599	-7.5329E-07	-3.2105E-06	-3.96379E-06	-3.96379	0.048734	0	0.048734	-2.5756E-07	0
132	315205	4028599	-9.2013E-07	-3.8907E-06	-4.81083E-06	-4.81083	0.041232	0	0.041232	-3.1408E-07	0
133	315457	4028599	-9.821E-07	-4.3391E-06	-5.3212E-06	-5.3212	0.077989	0	0.077989	-3.3711E-07	0
134	315708	4028599	-9.6639E-07	-4.4414E-06	-5.40779E-06	-5.40779	0.091301	0	0.091301	-3.3478E-07	0
135	315960	4028599	-8.6509E-07	-4.2434E-06	-5.10849E-06	-5.10849	0.11547	0.0092675	0.11547	-3.088E-07	0.0031476
136	316212	4028599	-4.8218E-07	-3.3584E-06	-3.84058E-06	-3.84058	0.10211	0.03612	0.10211	-2.0295E-07	0.01387
137	316463	4028599	3.5094E-07	-1.5205E-06	-1.16956E-06	-1.16956	0.14177	0.088298	0.14177	3.1057E-08	0.034651
138	316715	4028599	1.6501E-06	1.0032E-06	2.6533E-06	2.6533	0.14439	0.16717	0.14439	3.9661E-07	0.066061
139	316966	4028599	2.0579E-06	0.000002105	4.1629E-06	4.1629	0.085768	0.18377	0.085768	5.1967E-07	0.072718
140	317218	4028599	2.9851E-06	3.9539E-06	0.000006939	6.939	0.10675	0.23867	0.10675	7.8224E-07	0.094445
141	317469	4028599	1.2734E-06	1.6554E-06	2.9288E-06	2.9288	0.023157	0.10719	0.023157	3.2899E-07	0.042401
142	317721	4028599	8.1211E-07	1.0572E-06	1.86931E-06	1.86931	0.015301	0.069774	0.015301	2.0873E-07	0.027615
143	317973	4028599	9.2969E-07	1.0605E-06	1.99019E-06	1.99019	0.033708	0.085411	0.033708	2.337E-07	0.033768
144	318224	4028599	1.0741E-06	1.1779E-06	0.000002252	2.252	0.078287	0.097562	0.078287	2.7069E-07	0.038593
145	318476	4028599	8.4852E-07	8.3448E-07	0.000001683	1.683	0.073637	0.080071	0.073637	2.1087E-07	0.031662
146	318727	4028599	6.4908E-07	5.4597E-07	1.19505E-06	1.19505	0.066463	0.064836	0.066463	1.5778E-07	0.025611
147	318979	4028599	4.7304E-07	2.8589E-07	7.5893E-07	0.75893	0.059006	0.051763	0.059006	1.1057E-07	0.020412
148	313947	4028757	-1.9039E-07	-1.1535E-06	-1.34389E-06	-1.34389	0.022358	0.0073181	0.022358	-7.3415E-08	0.0027153
149	314199	4028757	-2.8641E-07	-1.5331E-06	-1.81951E-06	-1.81951	0.027722	0.0053256	0.027722	-1.0461E-07	0.0018778
150	314450	4028757	-4.7288E-07	-2.2312E-06	-2.70408E-06	-2.70408	0.032749	0.00070222	0.032749	-1.6471E-07	0.00023504
151	314702	4028757	-6.9717E-07	-3.1342E-06	-3.83137E-06	-3.83137	0.03981	0	0.03981	-2.3964E-07	0
152	314954	4028757	-9.7103E-07	-0.000004216	-5.18703E-06	-5.18703	0.05247	0	0.05247	-3.3161E-07	0
153	315205	4028757	-0.000001232	-5.1833E-06	-6.4153E-06	-6.4153	0.067957	0	0.067957	-4.1914E-07	0
154	315457	4028757	-1.3352E-06	-5.6611E-06	-6.9963E-06	-6.9963	0.081413	0	0.081413	-4.5585E-07	0

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
155	315708	4028757	-1.2122E-06	-5.5654E-06	-6.7776E-06	-6.7776	0.10687	0	0.10687	-4.2004E-07	0
156	315960	4028757	-8.4241E-07	-4.7225E-06	-5.56491E-06	-5.56491	0.12597	0.023253	0.12597	-3.1519E-07	0.008637
157	316212	4028757	-1.0237E-07	-2.9785E-06	-3.08087E-06	-3.08087	0.17164	0.072031	0.17164	-1.0878E-07	0.028131
158	316463	4028757	1.0264E-06	-5.238E-07	5.026E-07	0.5026	0.19594	0.14729	0.19594	2.0415E-07	0.058003
159	316715	4028757	3.2378E-06	3.6312E-06	0.000006869	6.869	0.21174	0.2816	0.21174	8.2559E-07	0.11152
160	316966	4028757	4.9441E-06	6.9144E-06	1.18585E-05	11.8585	0.20678	0.3788	0.20678	1.3111E-06	0.15018
161	317218	4028757	3.8262E-06	5.5523E-06	9.3785E-06	9.3785	0.10704	0.29989	0.10704	1.0101E-06	0.11865
162	317469	4028757	1.2334E-06	1.8004E-06	3.0338E-06	3.0338	0.017235	0.099954	0.017235	3.2293E-07	0.039592
163	317721	4028757	8.5583E-07	1.2371E-06	2.09293E-06	2.09293	0.019071	0.071096	0.019071	2.2275E-07	0.028188
164	317973	4028757	9.9494E-07	1.2304E-06	2.22534E-06	2.22534	0.031353	0.087906	0.031353	2.5354E-07	0.034801
165	318224	4028757	1.1789E-06	1.4249E-06	2.6038E-06	2.6038	0.087893	0.10502	0.087893	2.9957E-07	0.04157
166	318476	4028757	8.4741E-07	8.8339E-07	1.7308E-06	1.7308	0.08495	0.08247	0.08495	2.0866E-07	0.03258
167	318727	4028757	5.7171E-07	4.5632E-07	1.02803E-06	1.02803	0.07513	0.061255	0.07513	1.3532E-07	0.024166
168	318979	4028757	4.3096E-07	2.7385E-07	7.0481E-07	0.70481	0.066037	0.047557	0.066037	1.0057E-07	0.018766
169	313947	4028915	-2.5686E-07	-1.4085E-06	-1.66536E-06	-1.66536	0.016818	0.0064539	0.016818	-9.5468E-08	0.002345
170	314199	4028915	-3.9256E-07	-1.9368E-06	-2.32936E-06	-2.32936	0.023994	0.0040676	0.023994	-1.4002E-07	0.0013497
171	314450	4028915	-6.5586E-07	-0.000002937	-3.59286E-06	-3.59286	0.03461	0	0.03461	-2.263E-07	0
172	314702	4028915	-1.0247E-06	-4.3749E-06	-5.3996E-06	-5.3996	0.042688	0	0.042688	-3.4936E-07	0
173	314954	4028915	-1.4347E-06	-6.0002E-06	-7.4349E-06	-7.4349	0.056631	0	0.056631	-4.8653E-07	0
174	315205	4028915	-1.6424E-06	-6.9733E-06	-8.6157E-06	-8.6157	0.075577	0	0.075577	-5.5829E-07	0
175	315457	4028915	-1.6675E-06	-7.3101E-06	-8.9776E-06	-8.9776	0.092437	0	0.092437	-5.7055E-07	0
176	315708	4028915	-1.5057E-06	-6.8804E-06	-8.3861E-06	-8.3861	0.11714	0	0.11714	-5.2207E-07	0
177	315960	4028915	-7.4895E-07	-5.1538E-06	-5.90275E-06	-5.90275	0.1454	0.046594	0.1454	-3.0681E-07	0.017841
178	316212	4028915	2.9404E-07	-2.5591E-06	-2.26506E-06	-2.26506	0.1901	0.11985	0.1901	-1.9363E-08	0.046991
179	316463	4028915	2.3299E-06	1.6511E-06	0.000003981	3.981	0.27092	0.25831	0.27092	5.4153E-07	0.10201
180	316715	4028915	7.3671E-06	0.000010568	1.79351E-05	17.9351	0.29576	0.55239	0.29576	0.000001965	0.21928
181	316966	4028915	0.000010327	0.000015947	0.000026274	26.274	0.2813	0.71799	0.2813	2.8086E-06	0.28506
182	317218	4028915	5.9416E-06	9.2608E-06	1.52024E-05	15.2024	0.15433	0.44796	0.15433	1.5866E-06	0.17744
183	317469	4028915	1.6355E-06	2.5655E-06	0.000004201	4.201	0.021227	0.13034	0.021227	4.3113E-07	0.051712
184	317721	4028915	7.947E-07	1.2181E-06	2.0128E-06	2.0128	0.018207	0.065803	0.018207	2.0747E-07	0.026116
185	317973	4028915	7.4617E-07	9.9738E-07	1.74355E-06	1.74355	0.029003	0.065922	0.029003	1.9069E-07	0.026115
186	318224	4028915	1.1114E-06	0.000001396	2.5074E-06	2.5074	0.10539	0.10399	0.10539	2.7843E-07	0.041118
187	318476	4028915	7.9246E-07	8.6629E-07	1.65875E-06	1.65875	0.093357	0.077091	0.093357	1.9547E-07	0.030482
188	318727	4028915	5.8873E-07	5.5462E-07	1.14335E-06	1.14335	0.07585	0.058442	0.07585	1.4388E-07	0.023109
189	318979	4028915	4.5681E-07	3.5102E-07	8.0783E-07	0.80783	0.07403	0.046638	0.07403	1.1017E-07	0.018433
190	313947	4029074	-3.0584E-07	-1.7249E-06	-2.03074E-06	-2.03074	0.013472	0.0069596	0.013472	-1.1322E-07	0.0025147
191	314199	4029074	-4.978E-07	-2.4461E-06	-2.9439E-06	-2.9439	0.024224	0.0029808	0.024224	-1.7558E-07	0.00099039
192	314450	4029074	-9.3979E-07	-4.0986E-06	-5.03839E-06	-5.03839	0.031956	0	0.031956	-3.2167E-07	0
193	314702	4029074	-1.6213E-06	-6.6606E-06	-8.2819E-06	-8.2819	0.042672	0	0.042672	-5.4851E-07	0
194	314954	4029074	-2.2694E-06	-9.1441E-06	-1.14135E-05	-11.4135	0.060908	0	0.060908	-7.6479E-07	0
195	315205	4029074	-2.4446E-06	-0.000010011	-1.24556E-05	-12.4556	0.083076	0	0.083076	-8.2665E-07	0
196	315457	4029074	-2.2592E-06	-9.7635E-06	-1.20227E-05	-12.0227	0.10023	0	0.10023	-7.7196E-07	0
197	315708	4029074	-1.5569E-06	-8.0496E-06	-9.6065E-06	-9.6065	0.12722	0.017239	0.12722	-5.5775E-07	0.0059521
198	315960	4029074	-2.2501E-07	-4.8338E-06	-5.05881E-06	-5.05881	0.17151	0.10194	0.17151	-1.8299E-07	0.039834
199	316212	4029074	1.6766E-06	-3.1554E-07	1.36106E-06	1.36106	0.20909	0.2474	0.20909	3.2968E-07	0.09741
200	316463	4029074	5.3679E-06	7.1214E-06	1.24893E-05	12.4893	0.42164	0.50309	0.42164	1.3419E-06	0.19915
201	317218	4029074	0.000008387	0.000013962	0.000022349	22.349	0.21959	0.62539	0.21959	2.2501E-06	0.24828
202	317469	4029074	0.000001726	2.9975E-06	4.7235E-06	4.7235	0.032407	0.13476	0.032407	4.594E-07	0.053548
203	317721	4029074	9.3184E-07	0.000001526	2.45784E-06	2.45784	0.023919	0.074702	0.023919	2.4616E-07	0.029674
204	317973	4029074	8.5125E-07	0.000001165	2.01625E-06	2.01625	0.036403	0.073573	0.036403	2.1914E-07	0.029176
205	318224	4029074	1.1245E-06	1.5178E-06	2.6423E-06	2.6423	0.11931	0.098513	0.11931	2.8824E-07	0.039036
206	318476	4029074	7.973E-07	9.3295E-07	1.73025E-06	1.73025	0.10355	0.073156	0.10355	2.0088E-07	0.028958
207	318727	4029074	5.6706E-07	5.2939E-07	1.09645E-06	1.09645	0.085005	0.05589	0.085005	1.3891E-07	0.02209
208	318979	4029074	4.0888E-07	2.6647E-07	6.7535E-07	0.67535	0.074291	0.043888	0.074291	9.6519E-08	0.017321
209	313947	4029232	-4.0112E-07	-2.2468E-06	-2.64792E-06	-2.64792	0.0084826	0.0076019	0.0084826	-0.000000147	0.0026925
210	314199	4029232	-6.5665E-07	-3.2384E-06	-3.89505E-06	-3.89505	0.015016	0.0023346	0.015016	-2.3011E-07	0.00077849
211	314450	4029232	-1.4687E-06	-0.00000629	-7.7587E-06	-7.7587	0.027741	0	0.027741	-4.9883E-07	0
212	314702	4029232	-2.9654E-06	-0.000011864	-1.48294E-05	-14.8294	0.036323	0	0.036323	-9.948E-07	0
213	315205	4029232	-3.3639E-06	-0.000014073	-1.74369E-05	-17.4369	0.097985	0	0.097985	-1.1391E-06	0
214	315457	4029232	-2.8274E-06	-0.00001279	-1.56174E-05	-15.6174	0.1145	0	0.1145	-9.7136E-07	0
215	315708	4029232	-0.000001289	-8.9287E-06	-1.02177E-05	-10.2177	0.14295	0.06433	0.14295	-5.1514E-07	0.024636
216	315960	4029232	1.3122E-06	-2.6031E-06	-1.2909E-06	-1.2909	0.19166	0.23901	0.19166	2.0788E-07	0.094095
217	317218	4029232	9.1883E-06	0.000017361	2.65493E-05	26.5493	0.27965	0.69399	0.27965	2.4702E-06	0.27614
218	317469	4029232	2.5247E-06	4.8004E-06	7.3251E-06	7.3251	0.061982	0.1866	0.061982	6.8427E-07	0.074299
219	317721	4029232	1.2653E-06	2.1075E-06	3.3728E-06	3.3728	0.05672	0.10156	0.05672	3.3462E-07	0.04034
220	317973	4029232	1.5165E-06	2.3836E-06	3.9001E-06	3.9001	0.15772	0.12442	0.15772	3.9787E-07	0.049363
221	318224	4029232	9.9614E-07	1.3202E-06	2.31634E-06	2.31634	0.13286	0.088953	0.13286	2.5385E-07	0.035231
222	318476	4029232	6.912E-07	7.3623E-07	1.42743E-06	1.42743	0.11143	0.067014	0.11143	1.7069E-07	0.026504
223	318727	4029232	4.9185E-07	3.8854E-07	8.8039E-07	0.88039	0.092914	0.051544	0.092914	1.1752E-07	0.020361
224	318979	4029232	3.6752E-07	1.8542E-07	5.5294E-07	0.55294	0.077938	0.04134	0.077938	8.4911E-08	0.016316
225	313947	4029390	-7.069E-07	-3.3059E-06	-4.0128E-06	-4.0128	0	0.0015569	0	-2.4663E-07	0.00052083
226	314199	4029390	-1.1615E-06	-5.0612E-06	-6.2227E-06	-6.2227	0.0037335	0	0.0037335	-3.9786E-07	0
227	314450	4029390	-3.1687E-06	-0.00001244	-1.56087E-05	-15.6087	0.015459	0	0.015459	-1.0612E-06	0
228	315457	4029390	-3.8048E-06	-0.000016997	-2.08018E-05	-20.8018	0.14893	0	0.14893	-1.3107E-06	0
229	315708	4029390	-8.3724E-07	-9.1711E-06	-1.00083E-05	-10.00834	0.18766	0.14548	0.18766	-4.4078E-07	0.056921
230	317469	4029390	3.8745E-06	8.7267E-06	1.26012E-05	12.6012	0.28136	0.25801	0.28136	1.0846E-06	0.10308
231	317721	4029390	1.9009E-06	3.4855E-06	5.3864E-06	5.3864	0.20163	0.15304	0.20163	5.0449E-07	0.060783

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
232	317973	4029390	1.1271E-06	1.6645E-06	2.7916E-06	2.7916	0.1669	0.10341	0.1669	2.8599E-07	0.040944
233	318224	4029390	7.4032E-07	8.5255E-07	1.59287E-06	1.59287	0.13766	0.074664	0.13766	1.8084E-07	0.02951
234	318476	4029390	5.1496E-07	4.2154E-07	9.365E-07	0.9365	0.11826	0.056367	0.11826	1.2117E-07	0.02225
235	318727	4029390	3.7355E-07	1.7318E-07	5.4673E-07	0.54673	0.099707	0.04423	0.099707	8.4402E-08	0.017441
236	318979	4029390	2.8383E-07	2.8541E-08	3.12371E-07	0.312371	0.082909	0.036254	0.082909	6.1382E-08	0.014284
237	313947	4029548	-1.2346E-06	-5.2815E-06	-6.5161E-06	-6.5161	0	0	0	-4.2115E-07	0
238	314199	4029548	-2.4596E-06	-9.8271E-06	-1.22867E-05	-12.2867	0	0	0	-8.2724E-07	0
239	317469	4029548	2.5874E-06	5.5962E-06	8.1836E-06	8.1836	0.24517	0.1741	0.24517	7.2251E-07	0.069495
240	317721	4029548	1.2039E-06	1.9754E-06	3.1793E-06	3.1793	0.19976	0.10592	0.19976	3.1115E-07	0.042001
241	317973	4029548	6.8894E-07	7.7885E-07	1.46779E-06	1.46779	0.16468	0.071833	0.16468	1.6661E-07	0.028396
242	318224	4029548	4.533E-07	2.8836E-07	7.4166E-07	0.74166	0.12933	0.053745	0.12933	1.0296E-07	0.021207
243	318476	4029548	3.0786E-07	2.4328E-08	3.32188E-07	0.332188	0.11695	0.041205	0.11695	6.5074E-08	0.016235
244	318727	4029548	2.1342E-07	-1.2096E-07	9.246E-08	0.09246	0.093227	0.032538	0.093227	4.1067E-08	0.012801
245	318979	4029548	1.576E-07	-1.9273E-07	-3.513E-08	-0.03513	0.074286	0.027122	0.074286	2.72E-08	0.010657
246	313947	4029707	-0.000002411	-9.5199E-06	-1.19309E-05	-11.9309	0	0	0	-8.0903E-07	0
247	314199	4029707	-6.8835E-06	-0.000025744	-3.26275E-05	-32.6275	0	0	0	-0.000002283	0
248	315457	4029707	-5.6879E-06	-0.000026616	-3.23039E-05	-32.3039	0.12125	0.0037789	0.12125	-1.9817E-06	0.0013138
249	315708	4029707	3.2239E-06	-2.7087E-06	5.152E-07	0.5152	0.16941	0.59634	0.16941	5.1678E-07	0.23472
250	315960	4029707	0.000014285	0.000023056	0.000037341	37.341	0.20409	1.5436	0.20409	0.000003412	0.60791
251	316212	4029707	0.00001931	0.000034556	0.000053866	53.866	0.25883	1.8953	0.25883	0.000004794	0.74727
252	316463	4029707	0.000017222	0.000032269	0.000049491	49.491	0.23265	1.6423	0.23265	4.3241E-06	0.64863
253	316715	4029707	0.000012904	0.000025935	0.000038839	38.839	0.28951	1.1059	0.28951	3.3636E-06	0.43813
254	316966	4029707	9.8241E-06	0.000026289	3.61131E-05	36.1131	0.2538	0.48671	0.2538	0.000002925	0.19617
255	317218	4029707	3.6344E-06	8.9991E-06	1.26335E-05	12.6335	0.21219	0.1971	0.21219	1.0642E-06	0.079266
256	317469	4029707	1.3884E-06	2.3583E-06	3.7467E-06	3.7467	0.17896	0.11239	0.17896	3.6794E-07	0.044636
257	317721	4029707	8.419E-07	9.0172E-07	1.74362E-06	1.74362	0.15931	0.079334	0.15931	2.104E-07	0.031434
258	317973	4029707	4.184E-07	9.8303E-08	5.16703E-07	0.516703	0.12734	0.050519	0.12734	9.3432E-08	0.019933
259	318224	4029707	2.3511E-07	-1.9023E-07	4.488E-08	0.04488	0.11076	0.036736	0.11076	4.4265E-08	0.014444
260	318476	4029707	1.5079E-07	-3.0262E-07	-1.5183E-07	-0.15183	0.091004	0.028985	0.091004	2.2912E-08	0.011375
261	318727	4029707	9.7698E-08	-3.5089E-07	-2.53192E-07	-0.253192	0.091992	0.023353	0.091992	1.0221E-08	0.0091505
262	318979	4029707	7.1744E-08	-3.5646E-07	-2.84716E-07	-0.284716	0.074771	0.019886	0.074771	4.707E-09	0.0077862
263	313947	4029865	-4.1704E-06	-0.00001598	-2.01504E-05	-20.1504	0	0	0	-0.00000139	0
264	314199	4029865	-0.000010917	-0.000040449	-0.000051366	-51.366	0	0	0	-3.6139E-06	0
265	315457	4029865	-5.1867E-06	-0.000027075	-3.22617E-05	-32.2617	0.020009	0.064841	0.020009	-1.8712E-06	0.024046
266	315708	4029865	3.1149E-06	-1.8665E-06	1.2484E-06	1.2484	0.076444	0.52616	0.076444	5.4718E-07	0.20671
267	315960	4029865	7.2238E-06	9.6604E-06	1.68842E-05	16.8842	0.1192	0.79818	0.1192	0.000001701	0.31446
268	316212	4029865	9.8875E-06	0.000016131	2.60185E-05	26.0185	0.17302	0.92873	0.17302	2.4844E-06	0.36675
269	316463	4029865	7.4996E-06	0.000013464	2.09636E-05	20.9636	0.16865	0.7076	0.16865	1.8896E-06	0.27965
270	316715	4029865	5.9197E-06	0.00001145	1.73697E-05	17.3697	0.18035	0.47979	0.18035	1.5674E-06	0.19039
271	316966	4029865	0.000004108	8.2083E-06	1.23163E-05	12.3163	0.18905	0.29795	0.18905	1.1217E-06	0.11854
272	317218	4029865	2.0946E-06	4.0065E-06	6.1011E-06	6.1011	0.17589	0.1527	0.17589	5.7156E-07	0.060824
273	317469	4029865	9.1413E-07	1.1991E-06	2.11323E-06	2.11323	0.1296	0.085408	0.1296	2.3049E-07	0.033847
274	317721	4029865	4.9452E-07	2.8405E-07	7.7857E-07	0.77857	0.11296	0.057861	0.11296	1.1285E-07	0.022816
275	317973	4029865	3.9648E-07	8.6622E-08	4.83102E-07	0.483102	0.11561	0.046027	0.11561	9.0046E-08	0.018167
276	318224	4029865	2.5583E-07	-1.7069E-07	8.514E-08	0.08514	0.10354	0.034374	0.10354	5.2972E-08	0.013552
277	318476	4029865	1.1727E-07	-3.6705E-07	-2.4978E-07	-0.24978	0.081074	0.024285	0.081074	1.5662E-08	0.0095278
278	318727	4029865	4.7771E-08	-4.3944E-07	-3.91669E-07	-0.391669	0.06472	0.018474	0.06472	-2.2781E-09	0.0072173
279	318979	4029865	2.6685E-08	-4.2369E-07	-3.97005E-07	-0.397005	0.07426	0.015127	0.07426	-6.2043E-09	0.0059023
280	313947	4030023	-5.7809E-06	-0.000022006	-2.77869E-05	-27.7869	0	0	0	-1.9246E-06	0
281	315457	4030023	-2.1854E-06	-0.000016123	-1.83084E-05	-18.3084	0	0.16051	0	-9.2384E-07	0.061223
282	315708	4030023	2.5008E-06	-7.0793E-07	1.79287E-06	1.79287	0.02728	0.39785	0.02728	4.6446E-07	0.15622
283	315960	4030023	4.7615E-06	5.8195E-06	0.000010581	10.581	0.076613	0.50612	0.076613	1.1363E-06	0.19961
284	316212	4030023	5.4042E-06	8.3375E-06	1.37417E-05	13.7417	0.1082	0.51081	0.1082	1.3537E-06	0.20181
285	316463	4030023	4.0625E-06	6.8687E-06	1.09312E-05	10.9312	0.114	0.38419	0.114	1.0217E-06	0.15186
286	316715	4030023	3.4165E-06	6.2727E-06	9.6892E-06	9.6892	0.12238	0.27799	0.12238	9.0269E-07	0.1103
287	316966	4030023	2.3229E-06	3.9414E-06	6.2643E-06	6.2643	0.11354	0.19372	0.11354	6.0804E-07	0.0768
288	317218	4030023	1.3634E-06	2.1764E-06	3.5398E-06	3.5398	0.10559	0.11685	0.10559	3.5418E-07	0.046339
289	317469	4030023	7.7303E-07	9.1298E-07	1.68601E-06	1.68601	0.11993	0.074656	0.11993	1.9209E-07	0.029556
290	317721	4030023	4.1624E-07	1.8701E-07	6.0325E-07	0.60325	0.094591	0.050007	0.094591	9.3536E-08	0.019733
291	317973	4030023	2.6142E-07	-8.7427E-08	1.73993E-07	0.173993	0.077363	0.038441	0.077363	5.172E-08	0.01512
292	318224	4030023	2.1285E-07	-1.3764E-07	7.521E-08	0.07521	0.083773	0.030754	0.083773	4.2305E-08	0.012097
293	318476	4030023	1.8112E-07	-1.8324E-07	-2.12E-09	-0.00212	0.081391	0.02563	0.081391	3.6119E-08	0.010099
294	318727	4030023	1.1649E-07	-2.7572E-07	-1.5923E-07	-0.15923	0.070114	0.020081	0.070114	1.9405E-08	0.0079009
295	318979	4030023	4.1045E-08	-3.672E-07	-3.26155E-07	-0.326155	0.057416	0.014528	0.057416	-7.6848E-10	0.005685
296	313947	4030182	-0.0000069	-0.00002614	-0.00003304	-33.04	0	0	0	-0.000002298	0
297	315457	4030182	5.691E-08	-6.2198E-06	-6.16289E-06	-6.16289	0.000052001	0.19757	0.000052001	-1.8205E-07	0.076837
298	315708	4030182	2.4185E-06	1.2285E-06	0.000003647	3.647	0.020851	0.30982	0.020851	5.2367E-07	0.12192
299	315960	4030182	3.6452E-06	4.7976E-06	8.4428E-06	8.4428	0.057334	0.35544	0.057334	8.9991E-07	0.14037
300	316212	4030182	3.1432E-06	4.7954E-06	7.9386E-06	7.9386	0.06103	0.30524	0.06103	7.8065E-07	0.1206
301	316463	4030182	2.5297E-06	0.000004168	6.6977E-06	6.6977	0.079807	0.23563	0.079807	6.3932E-07	0.093194
302	316715	4030182	0.000002214	3.8125E-06	6.0265E-06	6.0265	0.077087	0.18786	0.077087	5.7683E-07	0.074437
303	316966	4030182	1.6056E-06	2.5268E-06	4.1324E-06	4.1324	0.090863	0.14171	0.090863	4.1223E-07	0.056121
304	317218	4030182	1.1878E-06	1.7663E-06	2.9541E-06	2.9541	0.06202	0.10235	0.06202	3.0688E-07	0.040556
305	317469	4030182	7.4731E-07	9.3921E-07	1.68652E-06	1.68652	0.10043	0.068173	0.10043	1.892E-07	0.027001
306	317721	4030182	4.2105E-07	3.1135E-07	7.324E-07	0.7324	0.089514	0.045871	0.089514	9.92E-08	0.018117
307	317973	4030182	2.5586E-07	-2.3566E-09	2.53503E-07	0.2535034	0.071005	0.034472	0.071005	5.3677E-08	0.013576
308	318224	4030182	1.6917E-07	-1.4277E-07	2.64E-08	0.0264	0.061208	0.027437	0.061208	3.0819E-08	0.010782

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
309	318476	4030182	1.3459E-07	-1.7123E-07	-3.664E-08	-0.03664	0.065301	0.022955	0.065301	2.3311E-08	0.009011
310	318727	4030182	1.3717E-07	-1.5123E-07	-1.406E-08	-0.01406	0.061112	0.020528	0.061112	2.6326E-08	0.0080753
311	318979	4030182	1.0863E-07	-1.9303E-07	-8.44E-08	-0.0844	0.052253	0.017115	0.052253	1.9764E-08	0.0067382
312	313947	4030340	-7.2233E-06	-0.000027313	-3.45363E-05	-34.5363	0	0	0	-2.4073E-06	0
313	314199	4030340	-0.000011312	-0.000042315	-0.000053627	-53.627	0	0	0	-3.7641E-06	0
314	314450	4030340	-0.000014297	-0.00005366	-0.000067957	-67.957	0	0	0	-4.7622E-06	0
315	314702	4030340	-0.000012867	-0.000049165	-0.000062032	-62.032	0	0	0	-4.2992E-06	0
316	314954	4030340	-7.2759E-06	-0.000029506	-3.67819E-05	-36.7819	0.0027751	0	0.0027751	-2.4574E-06	0
317	315205	4030340	-2.5296E-06	-0.000013344	-1.58736E-05	-15.8736	0	0.044181	0	-9.247E-07	0.016073
318	315457	4030340	5.0429E-07	-3.3714E-06	-2.86711E-06	-2.86711	0.010469	0.17405	0.010469	-2.7399E-09	0.068092
319	315708	4030340	1.8906E-06	9.7229E-07	2.86289E-06	2.86289	0.018767	0.23271	0.018767	4.1745E-07	0.091615
320	315960	4030340	2.5307E-06	3.0461E-06	5.5768E-06	5.5768	0.0485	0.24925	0.0485	6.213E-07	0.098455
321	316212	4030340	1.9279E-06	2.6834E-06	4.6113E-06	4.6113	0.020744	0.19622	0.020744	4.7018E-07	0.077496
322	316463	4030340	1.6916E-06	2.6564E-06	0.000004348	4.348	0.057324	0.15759	0.057324	4.2721E-07	0.062344
323	316715	4030340	1.5015E-06	2.3354E-06	3.8369E-06	3.8369	0.057091	0.13583	0.057091	3.824E-07	0.053748
324	316966	4030340	1.2092E-06	1.8032E-06	3.0124E-06	3.0124	0.066982	0.1103	0.066982	3.0669E-07	0.043651
325	317218	4030340	1.0201E-06	1.4776E-06	2.4977E-06	2.4977	0.070596	0.088526	0.070596	2.6256E-07	0.035056
326	317469	4030340	5.7083E-07	6.908E-07	1.26163E-06	1.26163	0.057613	0.055804	0.057613	1.4109E-07	0.022064
327	317721	4030340	4.0099E-07	3.4095E-07	7.4194E-07	0.74194	0.079828	0.04149	0.079828	9.6444E-08	0.016394
328	317973	4030340	2.3249E-07	4.7207E-08	2.79697E-07	0.279697	0.072503	0.028226	0.072503	5.1638E-08	0.011128
329	318224	4030340	1.7648E-07	-5.1548E-08	1.24932E-07	0.124932	0.058269	0.02522	0.058269	3.5528E-08	0.0099204
330	318476	4030340	1.3215E-07	-1.1247E-07	1.968E-08	0.01968	0.050819	0.021461	0.050819	2.4034E-08	0.0084293
331	318727	4030340	1.0361E-07	-1.3938E-07	-3.577E-08	-0.03577	0.053286	0.018532	0.053286	1.7154E-08	0.0072685
332	318979	4030340	1.1115E-07	-1.1263E-07	-1.48E-09	-0.00148	0.053681	0.017318	0.053681	2.0783E-08	0.0068014
333	313947	4030498	-6.0136E-06	-0.000023071	-2.90846E-05	-29.0846	0	0	0	-2.0097E-06	0
334	314199	4030498	-7.2518E-06	-0.00002801	-3.52618E-05	-35.2618	0.000013441	0	0.000013441	-2.4264E-06	0
335	314450	4030498	-7.3302E-06	-0.000028709	-3.60392E-05	-36.0392	0.0025146	0	0.0025146	-2.4603E-06	0
336	314702	4030498	-5.6541E-06	-0.000022943	-2.85971E-05	-28.5971	0.013311	0	0.013311	-1.9112E-06	0
337	314954	4030498	-3.2397E-06	-0.000014581	-1.78207E-05	-17.8207	0.019465	0	0.019465	-0.00000112	0
338	315205	4030498	-1.2332E-06	-8.1013E-06	-9.3345E-06	-9.3345	0.006243	0.069451	0.006243	-4.9938E-07	0.026455
339	315457	4030498	6.7053E-07	-2.0447E-06	-1.37417E-06	-1.37417	0.015127	0.15053	0.015127	7.8092E-08	0.059062
340	315708	4030498	1.6505E-06	1.1481E-06	2.7986E-06	2.7986	0.02835	0.18597	0.02835	3.8111E-07	0.073328
341	315960	4030498	0.000001649	1.7476E-06	3.3966E-06	3.3966	0.028862	0.17217	0.028862	3.9539E-07	0.067947
342	316212	4030498	1.2311E-06	1.3625E-06	2.5936E-06	2.5936	0.014853	0.13267	0.014853	2.9232E-07	0.052367
343	316463	4030498	1.1026E-06	1.4347E-06	2.5373E-06	2.5373	0.045701	0.10974	0.045701	2.7114E-07	0.043381
344	316715	4030498	1.0371E-06	1.3698E-06	2.4069E-06	2.4069	0.049721	0.10113	0.049721	2.5661E-07	0.039957
345	316966	4030498	9.1123E-07	1.2357E-06	2.14693E-06	2.14693	0.053556	0.086795	0.053556	2.2736E-07	0.034313
346	317218	4030498	7.5279E-07	0.00000102	1.77279E-06	1.77279	0.051176	0.069268	0.051176	1.9002E-07	0.027404
347	317469	4030498	5.4394E-07	6.4995E-07	1.19389E-06	1.19389	0.040417	0.051253	0.040417	1.3591E-07	0.020273
348	317721	4030498	3.4372E-07	3.0535E-07	6.4907E-07	0.64907	0.064397	0.03411	0.064397	8.3984E-08	0.013488
349	317973	4030498	1.1158E-07	-6.3752E-08	4.7828E-08	0.047828	0.015517	0.015587	0.015517	2.2652E-08	0.0061369
350	318224	4030498	1.7876E-07	-1.7655E-09	1.76995E-07	0.1769945	0.054237	0.023032	0.054237	3.8368E-08	0.0090751
351	318476	4030498	1.2428E-07	-8.3526E-08	4.0754E-08	0.040754	0.04524	0.018989	0.04524	2.3727E-08	0.0074656
352	318727	4030498	1.0342E-07	-1.0405E-07	-6.3E-10	-0.00063	0.044888	0.017192	0.044888	1.8375E-08	0.006752
353	318979	4030498	8.6855E-08	-1.148E-07	-2.7945E-08	-0.027945	0.045605	0.015621	0.045605	1.4292E-08	0.0061282
354	313947	4030656	-4.3899E-06	-0.000017458	-2.18479E-05	-21.8479	0.003173	0	0.003173	-1.4755E-06	0
355	314199	4030656	-4.6868E-06	-0.000018802	-2.34888E-05	-23.4888	0.0035387	0	0.0035387	-1.5799E-06	0
356	314450	4030656	-4.1393E-06	-0.00001701	-2.11493E-05	-21.1493	0.010211	0	0.010211	-1.4031E-06	0
357	314702	4030656	-2.7589E-06	-0.000012245	-1.50039E-05	-15.0039	0.019507	0	0.019507	-9.4923E-07	0
358	314954	4030656	-1.6755E-06	-8.6825E-06	-0.000010358	-10.358	0.017609	0.027193	0.017609	-6.0919E-07	0.0097079
359	315205	4030656	-4.7994E-07	-5.0293E-06	-5.50924E-06	-5.50924	0.026099	0.080405	0.026099	-2.4912E-07	0.03108
360	315457	4030656	5.8161E-07	-1.5856E-06	-1.00399E-06	-1.00399	0.022443	0.12395	0.022443	7.4367E-08	0.048607
361	315708	4030656	1.3027E-06	7.4701E-07	2.04971E-06	2.04971	0.028532	0.14751	0.028532	2.9939E-07	0.05818
362	315960	4030656	1.1451E-06	1.1546E-06	2.2997E-06	2.2997	0.034776	0.12235	0.034776	2.7221E-07	0.048292
363	316212	4030656	9.0112E-07	9.5201E-07	1.85313E-06	1.85313	0.028204	0.09566	0.028204	2.1527E-07	0.037758
364	316463	4030656	7.3004E-07	6.7356E-07	1.4036E-06	1.4036	0.039269	0.080412	0.039269	1.7147E-07	0.031724
365	316715	4030656	6.8929E-07	6.3342E-07	1.32271E-06	1.32271	0.041424	0.074956	0.041424	1.625E-07	0.02958
366	316966	4030656	6.4786E-07	6.7319E-07	1.32105E-06	1.32105	0.039812	0.067184	0.039812	1.5596E-07	0.026529
367	317218	4030656	5.5681E-07	6.3098E-07	1.18779E-06	1.18779	0.057173	0.055147	0.057173	1.3663E-07	0.021794
368	317469	4030656	3.1011E-07	2.8262E-07	5.9273E-07	0.59273	0.01769	0.029698	0.01769	7.6677E-08	0.011746
369	317721	4030656	2.1702E-07	1.3075E-07	3.4777E-07	0.34777	0.024093	0.024254	0.024093	5.0461E-08	0.0095747
370	317973	4030656	4.7543E-08	-1.041E-07	-5.6557E-08	-0.056557	0.0074695	0.0086902	0.0074695	7.5598E-09	0.0034138
371	318224	4030656	1.7798E-07	3.7225E-08	2.15205E-07	0.215205	0.048673	0.021652	0.048673	3.9502E-08	0.0085381
372	318476	4030656	1.2511E-07	-5.2447E-08	7.2663E-08	0.072663	0.038786	0.017427	0.038786	2.5497E-08	0.0068614
373	318727	4030656	9.1273E-08	-1.0103E-07	-9.757E-09	-0.009757	0.037537	0.014964	0.037537	1.6373E-08	0.0058803
374	318979	4030656	7.9155E-08	-1.1065E-07	-3.1495E-08	-0.031495	0.041051	0.013989	0.041051	1.3211E-08	0.0054919
375	313947	4030815	-3.1675E-06	-0.000013031	-1.61985E-05	-16.1985	0.0053612	0	0.0053612	-1.0722E-06	0
376	314199	4030815	-3.1209E-06	-0.000012991	-1.61119E-05	-16.1119	0.0081776	0	0.0081776	-1.0606E-06	0
377	314450	4030815	-2.3754E-06	-0.000010455	-1.28304E-05	-12.8304	0.015253	0	0.015253	-8.1618E-07	0
378	314702	4030815	-0.000001448	-7.3414E-06	-8.7894E-06	-8.7894	0.021174	0.016934	0.021174	-5.1959E-07	0.0058629
379	314954	4030815	-8.3678E-07	-0.000005527	-6.36378E-06	-6.36378	0.025421	0.045896	0.025421	-3.3718E-07	0.017444
380	315205	4030815	-1.1693E-07	-3.3579E-06	-3.47483E-06	-3.47483	0.022038	0.080302	0.022038	-1.2305E-07	0.031213
381	315457	4030815	5.565E-07	-1.2105E-06	-0.000000654	-0.654	0.028204	0.10676	0.028204	8.2894E-08	0.041881
382	315708	4030815	9.1172E-07	2.9625E-07	1.20797E-06	1.20797	0.039755	0.11012	0.039755	2.0265E-07	0.043414
383	315960	4030815	7.2278E-07	5.5473E-07	1.27751E-06	1.27751	0.025611	0.082977	0.025611	1.6617E-07	0.032735
384	316212	4030815	6.8994E-07	6.9591E-07	1.38585E-06	1.38585	0.035558	0.072311	0.035558	1.6559E-07	0.028548
385	316463	4030815	5.7307E-07	5.0197E-07	1.07504E-06	1.07504	0.038967	0.063882	0.038967	1.3382E-07	0.025192

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
386	316715	4030815	5.2678E-07	4.0155E-07	9.2833E-07	0.92833	0.038236	0.059507	0.038236	1.219E-07	0.023461
387	316966	4030815	4.7095E-07	0.000000319	7.8995E-07	0.78995	0.032476	0.05348	0.032476	1.0851E-07	0.02109
388	317218	4030815	4.0822E-07	3.0144E-07	7.0966E-07	0.70966	0.035166	0.043796	0.035166	9.6461E-08	0.0173
389	317469	4030815	2.0047E-07	1.173E-07	3.1777E-07	0.31777	0.012362	0.021061	0.012362	4.7664E-08	0.0083218
390	317721	4030815	1.1696E-07	2.4529E-09	1.19413E-07	0.1194129	0.0073342	0.013778	0.0073342	2.6257E-08	0.0054369
391	317973	4030815	5.3699E-08	-9.4818E-08	-4.1119E-08	-0.041119	0.010032	0.0091026	0.010032	9.2674E-09	0.0035783
392	318224	4030815	1.6621E-07	3.2626E-08	1.98836E-07	0.198836	0.04942	0.020099	0.04942	3.6972E-08	0.007923
393	318476	4030815	1.2807E-07	-2.7551E-08	1.00519E-07	0.100519	0.043907	0.016864	0.043907	2.7052E-08	0.0066445
394	318727	4030815	9.2498E-08	-7.6408E-08	1.609E-08	0.01609	0.037732	0.013887	0.037732	1.7817E-08	0.0054636
395	318979	4030815	7.0864E-08	-1.0323E-07	-3.2366E-08	-0.032366	0.027767	0.012231	0.027767	1.2074E-08	0.0048046
396	314147	4029689	-4.5989E-06	-0.000017494	-2.20929E-05	-22.0929	0	0	0	-1.5309E-06	0
397	314961	4030517	-2.9344E-06	-0.000013437	-1.63714E-05	-16.3714	0.020114	0	0.020114	-1.0185E-06	0
398	315839	4030375	2.2408E-06	2.1985E-06	4.4393E-06	4.4393	0.031044	0.23449	0.031044	5.3565E-07	0.092523
399	316657	4030352	1.5149E-06	2.3834E-06	3.8983E-06	3.8983	0.058975	0.13686	0.058975	3.8624E-07	0.054167
400	317361	4030179	8.052E-07	1.0666E-06	1.8718E-06	1.8718	0.064951	0.075323	0.064951	2.025E-07	0.029811
401	318513	4029741	1.2235E-07	-3.5158E-07	-2.2923E-07	-0.22923	0.094262	0.026317	0.094262	1.5702E-08	0.010317
402	318199	4028391	9.2969E-07	9.7235E-07	1.90204E-06	1.90204	0.075139	0.087498	0.075139	2.3154E-07	0.034563
403	317302	4027693	2.0518E-07	-6.0708E-07	-4.019E-07	-0.4019	0.059072	0.040137	0.059072	2.9449E-08	0.015757
404	316265	4028364	-3.5095E-07	-2.7227E-06	-3.07365E-06	-3.07365	0.098952	0.028685	0.098952	-1.5095E-07	0.011013
405	316611	4028986	7.5806E-06	0.000010823	1.84036E-05	18.4036	0.3304	0.58721	0.3304	2.0054E-06	0.23309
406	314180	4029952	-0.000011706	-0.000043444	-0.00005515	-55.15	0	0	0	-3.8781E-06	0
407	314516	4030398	-0.000010869	-0.000041579	-0.000052448	-52.448	0	0	0	-3.6318E-06	0
408	314946	4028025	-3.0715E-07	-1.4546E-06	-1.76175E-06	-1.76175	0.035081	0.0011386	0.035081	-1.0766E-07	0.00037792
409	317360	4029626	2.6848E-06	5.8304E-06	8.5152E-06	8.5152	0.25341	0.17381	0.25341	7.5607E-07	0.069456
410	314997	4030202	-0.000018092	-0.000068794	-0.000086886	-86.886	0	0	0	-6.0233E-06	0
411	314203	4030220	-0.000014949	-0.000055321	-0.00007027	-70.27	0	0	0	-4.9617E-06	0
412	314191	4030199	-0.000014806	-0.000054791	-0.000069597	-69.597	0	0	0	-4.9133E-06	0
413	314181	4030131	-0.000014427	-0.000053396	-0.000067823	-67.823	0	0	0	-4.7844E-06	0
414	314183	4030083	-0.00001395	-0.000051662	-0.000065612	-65.612	0	0	0	-4.6243E-06	0
415	314195	4030020	-0.000013734	-0.00005085	-0.000064584	-64.584	0	0	0	-4.5499E-06	0
416	314233	4029949	-0.000015124	-0.000055775	-0.000070899	-70.899	0	0	0	-5.0039E-06	0
417	314233	4029852	-0.000012935	-0.000047705	-0.00006064	-60.64	0	0	0	-4.2778E-06	0
418	314230	4029645	-5.7777E-06	-0.000021759	-2.75367E-05	-27.5367	0	0	0	-1.9193E-06	0
419	314307	4029548	-4.3335E-06	-0.000016627	-2.09605E-05	-20.9605	0	0	0	-0.000001445	0
420	314588	4029384	-5.9257E-06	-0.000022451	-2.83767E-05	-28.3767	0.016801	0	0.016801	-0.00000197	0
421	314832	4029237	-3.5171E-06	-0.000014005	-1.75221E-05	-17.5221	0.057091	0	0.057091	-1.1792E-06	0
422	314912	4029203	-3.1774E-06	-0.000012814	-1.59914E-05	-15.9914	0.070055	0	0.070055	-1.0681E-06	0
423	314995	4029207	-3.2695E-06	-0.000013267	-1.65365E-05	-16.5365	0.079633	0	0.079633	-1.1006E-06	0
424	315090	4029260	-3.7775E-06	-0.000015401	-1.91785E-05	-19.1785	0.095471	0	0.095471	-1.2734E-06	0
425	315383	4029404	-4.5246E-06	-0.000019292	-2.38166E-05	-23.8166	0.1413	0	0.1413	-1.5438E-06	0
426	315583	4029427	-2.4992E-06	-0.000013884	-1.63832E-05	-16.3832	0.16822	0.063936	0.16822	-9.3307E-07	0.024442
427	315713	4029427	-4.7387E-07	-8.6452E-06	-9.11907E-06	-9.11907	0.20624	0.18831	0.20624	-3.5786E-07	0.074034
428	315808	4029411	1.0719E-06	-4.7119E-06	-0.00000364	-3.64	0.21462	0.28987	0.21462	7.4816E-08	0.1142
429	315997	4029323	3.9663E-06	2.3912E-06	6.3575E-06	6.3575	0.22697	0.47722	0.22697	8.8667E-07	0.18833
430	316417	4029123	0.000006341	8.7547E-06	1.50957E-05	15.0957	0.42366	0.58638	0.42366	1.5936E-06	0.23218
431	316507	4029078	7.0034E-06	9.9811E-06	1.69845E-05	16.9845	0.43949	0.60285	0.43949	1.8002E-06	0.23891
432	316587	4029063	0.000011058	0.000016675	0.000027733	27.733	0.42606	0.82	0.42606	2.9607E-06	0.32582
433	316644	4029032	0.000012866	0.000019589	0.000032455	32.455	0.39549	0.90063	0.39549	3.4921E-06	0.35821
434	316721	4028973	0.000011013	0.000016614	0.000027627	27.627	0.33889	0.77491	0.33889	2.9852E-06	0.30802
435	316780	4028941	0.000010254	0.000015458	0.000025712	25.712	0.31263	0.72172	0.31263	2.7792E-06	0.2868
436	316846	4028943	0.000011749	0.000018041	0.00002979	29.79	0.33186	0.80433	0.33186	3.2056E-06	0.31975
437	316899	4028951	0.000012708	0.00001973	0.000032438	32.438	0.32592	0.86141	0.32592	3.4756E-06	0.34237
438	316940	4028969	0.000013333	0.000020903	0.000034236	34.236	0.32223	0.90436	0.32223	3.6467E-06	0.35926
439	317023	4029035	0.00001385	0.000022269	0.000036119	36.119	0.30906	0.96031	0.30906	3.7726E-06	0.38126
440	317116	4029113	0.000012346	0.000020741	0.000033087	33.087	0.28201	0.89422	0.28201	3.3349E-06	0.35524
441	317168	4029156	0.000010473	0.000018232	0.000028705	28.705	0.27313	0.78756	0.27313	0.000002808	0.31285
442	317192	4029191	9.7087E-06	0.000017462	2.71707E-05	27.1707	0.27117	0.74104	0.27117	2.5972E-06	0.29446
443	317227	4029275	9.0474E-06	0.000018245	2.72924E-05	27.2924	0.29966	0.66489	0.29966	2.4565E-06	0.26511
444	317230	4029386	9.8202E-06	0.000025581	3.54012E-05	35.4012	0.39256	0.54525	0.39256	2.8628E-06	0.22035
445	317225	4029603	6.3443E-06	0.000017921	2.42653E-05	24.2653	0.27427	0.26218	0.27427	1.9432E-06	0.10656
446	316912	4029594	0.000016576	0.000039514	0.00005609	56.09	0.44016	1.2007	0.44016	4.5567E-06	0.47922
447	316482	4029611	0.000034678	0.000066744	0.000101422	101.422	0.40382	3.3414	0.40382	0.000008681	1.3189
448	316188	4029644	0.000027951	0.000052201	0.000080152	80.152	0.30996	2.8411	0.30996	6.8648E-06	1.1189
449	315845	4029662	0.000010288	0.000013734	0.000024022	24.022	0.23384	1.2286	0.23384	2.3413E-06	0.48412
450	315405	4029682	-0.000007132	-0.000031056	-0.000038188	-38.188	0.12205	0	0.12205	-2.4421E-06	0
451	315412	4030185	-5.4438E-07	-8.2287E-06	-8.77308E-06	-8.77308	0	0.16892	0	-3.6195E-07	0.065309
452	314948	4030203	-0.00002162	-0.000081321	-0.000102941	-102.941	0	0	0	-7.1904E-06	0
453	314898	4030204	-0.000024817	-0.000092668	-0.000117485	-117.485	0	0	0	-8.2496E-06	0
454	314848	4030205	-0.000027327	-0.00010153	-0.000128857	-128.857	0	0	0	-9.0807E-06	0
455	314799	4030207	-0.000029155	-0.00010793	-0.000137085	-137.085	0	0	0	-9.6853E-06	0
456	314749	4030208	-0.00003035	-0.00011206	-0.00014241	-142.41	0	0	0	-0.000010081	0
457	314699	4030209	-0.000030968	-0.0001141	-0.000145068	-145.068	0	0	0	-0.000010284	0
458	314650	4030210	-0.000031021	-0.00011412	-0.000145141	-145.141	0	0	0	-0.0000103	0
459	314600	4030211	-0.000030624	-0.00011252	-0.000143144	-143.144	0	0	0	-0.000010165	0
460	314550	4030212	-0.00002981	-0.00010943	-0.00013924	-139.24	0	0	0	-9.8926E-06	0
461	314501	4030213	-0.000028631	-0.00010505	-0.000133681	-133.681	0	0	0	-9.4989E-06	0
462	314451	4030215	-0.000027041	-0.000099202	-0.000126243	-126.243	0	0	0	-8.9693E-06	0

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
463	314401	4030216	-0.000024968	-0.000091634	-0.000116602	-116.602	0	0	0	-8.2798E-06	0
464	314352	4030217	-0.000022534	-0.000082786	-0.00010532	-105.32	0	0	0	-7.4719E-06	0
465	314302	4030218	-0.000019973	-0.000073502	-0.000093475	-93.475	0	0	0	-6.6236E-06	0
466	314252	4030219	-0.000017404	-0.000064201	-0.000081605	-81.605	0	0	0	-5.7734E-06	0
467	314186	4030165	-0.000014788	-0.000054709	-0.000069497	-69.497	0	0	0	-4.9053E-06	0
468	314189	4030052	-0.000013833	-0.000051227	-0.00006506	-65.06	0	0	0	-0.000004584	0
469	314214	4029984	-0.000014431	-0.00005333	-0.000067761	-67.761	0	0	0	-4.7781E-06	0
470	314233	4029900	-0.00001396	-0.000051491	-0.000065451	-65.451	0	0	0	-4.6176E-06	0
471	314233	4029811	-0.000011917	-0.000043974	-0.000055891	-55.891	0	0	0	-3.9412E-06	0
472	314232	4029769	-0.00001075	-0.00003972	-0.00005047	-50.47	0	0	0	-3.5559E-06	0
473	314231	4029728	-9.4211E-06	-0.000034897	-4.43181E-05	-44.3181	0	0	0	-3.1181E-06	0
474	314230	4029686	-7.8167E-06	-0.000029098	-3.69147E-05	-36.9147	0	0	0	-0.00000259	0
475	314255	4029613	-5.2923E-06	-0.000020029	-2.53213E-05	-25.3213	0	0	0	-1.7598E-06	0
476	314281	4029581	-4.7589E-06	-0.000018134	-2.28929E-05	-22.8929	0	0	0	-1.5847E-06	0
477	314347	4029525	-4.8374E-06	-0.00001846	-2.32974E-05	-23.2974	0	0	0	-1.6109E-06	0
478	314387	4029502	-5.2934E-06	-0.000020118	-2.54114E-05	-25.4114	0	0	0	-1.7611E-06	0
479	314427	4029478	-5.6401E-06	-0.00002138	-2.70201E-05	-27.0201	0.0010854	0	0.0010854	-1.8754E-06	0
480	314468	4029455	-5.8694E-06	-0.000022216	-2.80854E-05	-28.0854	0.0043328	0	0.0043328	-0.000001951	0
481	314508	4029431	-5.9314E-06	-0.000022452	-2.83834E-05	-28.3834	0.0080681	0	0.0080681	-1.9717E-06	0
482	314548	4029408	-5.9642E-06	-0.000022579	-2.85432E-05	-28.5432	0.017716	0	0.017716	-1.9826E-06	0
483	314629	4029360	-5.6017E-06	-0.000021304	-2.69057E-05	-26.9057	0.021805	0	0.021805	-1.8636E-06	0
484	314670	4029335	-5.0732E-06	-0.000019437	-2.45102E-05	-24.5102	0.028054	0	0.028054	-0.00000169	0
485	314710	4029311	-4.5959E-06	-0.000017764	-2.23599E-05	-22.3599	0.029508	0	0.029508	-1.5333E-06	0
486	314751	4029286	-4.1964E-06	-0.000016373	-2.05694E-05	-20.5694	0.040295	0	0.040295	-1.4022E-06	0
487	314791	4029262	-3.8339E-06	-0.000015111	-1.89449E-05	-18.9449	0.050483	0	0.050483	-1.2831E-06	0
488	314872	4029220	-3.3191E-06	-0.000013321	-1.66401E-05	-16.6401	0.066177	0	0.066177	-1.1145E-06	0
489	314953	4029205	-3.2299E-06	-0.000013062	-1.62919E-05	-16.2919	0.074894	0	0.074894	-1.0864E-06	0
490	315027	4029225	-3.4351E-06	-0.000013971	-1.74061E-05	-17.4061	0.085408	0	0.085408	-1.1568E-06	0
491	315058	4029242	-3.5977E-06	-0.000014659	-1.82567E-05	-18.2567	0.089694	0	0.089694	-1.2122E-06	0
492	315132	4029281	-3.9783E-06	-0.000016237	-2.02153E-05	-20.2153	0.095636	0	0.095636	-0.000001342	0
493	315174	4029301	-4.1645E-06	-0.000017022	-2.11865E-05	-21.1865	0.090541	0	0.090541	-1.4059E-06	0
494	315216	4029322	-0.000004334	-0.000017762	-0.000022096	-22.096	0.10506	0	0.10506	-1.4646E-06	0
495	315258	4029342	-4.4783E-06	-0.00001844	-2.29183E-05	-22.9183	0.11248	0	0.11248	-1.5155E-06	0
496	315300	4029363	-4.5722E-06	-0.000018972	-2.35442E-05	-23.5442	0.12113	0	0.12113	-1.5502E-06	0
497	315341	4029383	-4.5931E-06	-0.000019277	-2.38701E-05	-23.8701	0.12696	0	0.12696	-1.5614E-06	0
498	315423	4029408	-4.2374E-06	-0.000018471	-2.27084E-05	-22.7084	0.14697	0	0.14697	-1.4529E-06	0
499	315463	4029413	-3.9003E-06	-0.000017496	-2.13963E-05	-21.3963	0.15519	0	0.15519	-1.3461E-06	0
500	315503	4029418	-3.5094E-06	-0.000016396	-1.99054E-05	-19.9054	0.1615	0.0058464	0.1615	-1.2245E-06	0.0020014
501	315543	4029423	-3.0331E-06	-0.000015188	-1.82211E-05	-18.2211	0.16624	0.032278	0.16624	-1.0855E-06	0.011599
502	315626	4029427	-0.000001874	-0.000012308	-0.000014182	-14.182	0.17574	0.099939	0.17574	-7.5322E-07	0.038898
503	315669	4029427	-1.1901E-06	-0.000010491	-1.16811E-05	-11.6811	0.18837	0.14183	0.18837	-5.5889E-07	0.055591
504	315760	4029419	2.6442E-07	-6.7243E-06	-6.45988E-06	-6.45988	0.20995	0.23489	0.20995	-1.4932E-07	0.092455
505	315846	4029394	1.5605E-06	-3.3997E-06	-1.8392E-06	-1.8392	0.2042	0.3179	0.2042	2.1554E-07	0.12525
506	315883	4029376	0.000002081	-2.0621E-06	1.89E-08	0.0189	0.21371	0.34976	0.21371	3.6339E-07	0.13784
507	315921	4029358	2.6606E-06	-6.3945E-07	2.02115E-06	2.02115	0.21693	0.38788	0.21693	5.2545E-07	0.15293
508	315959	4029341	3.2904E-06	8.4704E-07	4.13744E-06	4.13744	0.22202	0.43065	0.22202	7.0008E-07	0.16987
509	316039	4029303	4.6538E-06	3.9445E-06	8.5983E-06	8.5983	0.23319	0.52256	0.23319	1.0781E-06	0.20633
510	316081	4029283	5.1989E-06	5.2078E-06	1.04067E-05	10.4067	0.2404	0.55694	0.2404	1.2314E-06	0.21999
511	316123	4029263	5.5728E-06	6.1451E-06	1.17179E-05	11.7179	0.24985	0.57956	0.24985	1.3378E-06	0.22898
512	316165	4029243	5.8254E-06	6.8437E-06	1.26691E-05	12.6691	0.2626	0.59347	0.2626	0.000001411	0.23455
513	316207	4029223	6.0277E-06	7.4307E-06	1.34584E-05	13.4584	0.2809	0.60303	0.2809	1.4712E-06	0.23842
514	316249	4029203	6.1383E-06	7.8195E-06	1.39578E-05	13.9578	0.30746	0.60538	0.30746	1.5069E-06	0.2394
515	316291	4029183	6.1727E-06	8.0571E-06	1.42298E-05	14.2298	0.33166	0.60241	0.33166	1.5217E-06	0.23823
516	316333	4029163	6.1407E-06	8.1704E-06	1.43111E-05	14.3111	0.36405	0.59437	0.36405	1.5188E-06	0.23506
517	316375	4029143	6.1953E-06	8.4039E-06	1.45992E-05	14.5992	0.39528	0.58844	0.39528	1.5428E-06	0.23283
518	316447	4029108	6.3425E-06	8.8311E-06	1.51736E-05	15.1736	0.45203	0.57942	0.45203	1.6004E-06	0.22948
519	316477	4029093	6.4802E-06	9.1101E-06	1.55903E-05	15.5903	0.46258	0.58072	0.46258	1.6453E-06	0.23003
520	316547	4029070	8.7468E-06	0.000012885	2.16318E-05	21.6318	0.43614	0.69694	0.43614	2.2986E-06	0.27655
521	316615	4029047	0.000012185	0.000018482	0.000030667	30.667	0.40801	0.87192	0.40801	3.2905E-06	0.34668
522	316683	4029003	0.000012242	0.000018585	0.000030827	30.827	0.36741	0.85294	0.36741	3.3259E-06	0.3392
523	316751	4028957	0.000010586	0.000015955	0.000026541	26.541	0.32337	0.74593	0.32337	2.8682E-06	0.29644
524	316813	4028942	0.000011123	0.000016947	0.00002807	28.07	0.29377	0.76943	0.29377	3.0273E-06	0.30585
525	316872	4028947	0.000012329	0.000019047	0.000031376	31.376	0.28065	0.83823	0.28065	3.3693E-06	0.33321
526	316967	4028991	0.000013721	0.000021698	0.000035419	35.419	0.32047	0.93574	0.32047	3.7495E-06	0.3716
527	316995	4029013	0.000013939	0.000022221	0.00003616	36.16	0.31553	0.95667	0.31553	3.8044E-06	0.37985
528	317054	4029061	0.000013445	0.000021875	0.00003532	35.32	0.29168	0.94706	0.29168	3.6508E-06	0.376
529	317085	4029087	0.000013012	0.00002148	0.000034492	34.492	0.28727	0.92866	0.28727	3.5247E-06	0.36882
530	317142	4029135	0.000011455	0.000019575	0.00003103	31.03	0.27647	0.8448	0.27647	3.0833E-06	0.3356
531	317210	4029233	9.4011E-06	0.000017721	2.71221E-05	27.1221	0.28248	0.7123	0.28248	0.000002525	0.2834
532	317228	4029312	9.0258E-06	0.000019567	2.85928E-05	28.5928	0.33253	0.63618	0.33253	2.4839E-06	0.25433
533	317229	4029349	9.1966E-06	0.000021799	3.09956E-05	30.9956	0.35995	0.59455	0.35995	2.5912E-06	0.23873
534	317229	4029429	0.000011335	0.000032357	0.000043692	43.692	0.43238	0.49851	0.43238	3.4414E-06	0.20327
535	317228	4029473	0.000013373	0.00004066	0.000054033	54.033	0.41008	0.45485	0.41008	4.1975E-06	0.18745
536	317227	4029516	0.000013573	0.000042381	0.000055954	55.954	0.40536	0.38852	0.40536	4.3343E-06	0.16138
537	317226	4029559	9.5332E-06	0.000028659	3.81922E-05	38.1922	0.35209	0.31551	0.35209	0.000003	0.12973
538	317180	4029601	9.6767E-06	0.000029643	3.93197E-05	39.3197	0.30012	0.30411	0.30012	3.0635E-06	0.12541
539	317136	4029600	0.000020089	0.000067441	0.00008753	87.53	0.3166	0.36625	0.3166	6.6345E-06	0.1571

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Max Hazard Index	Worker Chronic Max Hazard Index
540	317091	4029599	0.000036649	0.00012774	0.000164389	164.389	0.31892	0.45378	0.31892	0.000012326	0.20293
541	317046	4029598	0.000039755	0.00013743	0.000177185	177.185	0.36547	0.55805	0.36547	0.000013303	0.24591
542	317001	4029596	0.000023867	0.000075599	0.000099466	99.466	0.3899	0.69106	0.3899	7.6196E-06	0.28676
543	316956	4029595	0.000017461	0.000047817	0.000065278	65.278	0.41321	0.90849	0.41321	5.1617E-06	0.3667
544	316864	4029596	0.000018238	0.000039689	0.000057927	57.927	0.4118	1.5408	0.4118	4.7914E-06	0.61179
545	316816	4029598	0.000021475	0.000044451	0.000065926	65.926	0.43688	1.9456	0.43688	5.5087E-06	0.77037
546	316769	4029600	0.000024346	0.000049206	0.000073552	73.552	0.423	2.2819	0.423	6.1688E-06	0.9022
547	316721	4029602	0.000026765	0.000053367	0.000080132	80.132	0.43352	2.55	0.43352	6.7395E-06	1.0076
548	316673	4029604	0.000028756	0.000056881	0.000085637	85.637	0.43097	2.7642	0.43097	7.2146E-06	1.0922
549	316625	4029606	0.000029954	0.000059166	0.00008912	89.12	0.43058	2.9122	0.43058	0.000007484	1.1507
550	316578	4029608	0.000031108	0.000061215	0.000092323	92.323	0.43077	3.0428	0.43077	7.7538E-06	1.2022
551	316530	4029610	0.000032536	0.000063513	0.000096049	96.049	0.41743	3.1768	0.41743	8.1117E-06	1.2548
552	316433	4029617	0.000035894	0.000068039	0.000103933	103.933	0.41962	3.3975	0.41962	0.000009035	1.3405
553	316384	4029622	0.000035505	0.000066817	0.000102322	102.322	0.40207	3.3593	0.40207	0.000008937	1.3251
554	316335	4029628	0.00003367	0.000063304	0.000096974	96.974	0.37891	3.2389	0.37891	8.4294E-06	1.2771
555	316286	4029633	0.000031583	0.000059375	0.000090958	90.958	0.35543	3.1021	0.35543	7.8518E-06	1.2226
556	316237	4029638	0.000029667	0.00005567	0.000085337	85.337	0.33244	2.9695	0.33244	7.3271E-06	1.1698
557	316139	4029646	0.000026883	0.000049923	0.000076806	76.806	0.29709	2.769	0.29709	6.5698E-06	1.0903
558	316090	4029649	0.000025607	0.000047141	0.000072748	72.748	0.28395	2.6709	0.28395	6.2273E-06	1.0516
559	316041	4029652	0.000023757	0.000043119	0.000066876	66.876	0.27225	2.5118	0.27225	5.7453E-06	0.98889
560	315992	4029654	0.000021088	0.000037329	0.000058417	58.417	0.25863	2.2647	0.25863	5.0647E-06	0.89167
561	315943	4029657	0.000017818	0.000030227	0.000048045	48.045	0.25285	1.9541	0.25285	4.2376E-06	0.76948
562	315894	4029660	0.000014159	0.000022243	0.000036402	36.402	0.24304	1.6027	0.24304	3.3152E-06	0.63124
563	315796	4029664	7.1357E-06	6.6668E-06	1.38025E-05	13.8025	0.22725	0.93611	0.22725	0.000001537	0.36899
564	315747	4029667	4.5635E-06	7.2407E-07	5.28757E-06	5.28757	0.22016	0.7084	0.22016	8.7055E-07	0.27928
565	315698	4029669	2.4308E-06	-0.000004412	-1.9812E-06	-1.9812	0.2102	0.52988	0.2102	3.0817E-07	0.20891
566	315649	4029671	6.1611E-07	-9.0078E-06	-8.39169E-06	-8.39169	0.19732	0.3882	0.19732	-1.802E-07	0.15304
567	315600	4029673	-1.0104E-06	-0.000013356	-1.43664E-05	-14.3664	0.18271	0.27142	0.18271	-6.2784E-07	0.10698
568	315551	4029676	-2.5454E-06	-0.00001766	-2.02054E-05	-20.2054	0.16691	0.1707	0.16691	-1.0595E-06	0.067198
569	315502	4029678	-0.000004078	-0.000021819	-0.000025897	-25.897	0.15253	0.079343	0.15253	-1.4992E-06	0.031009
570	315453	4029680	-0.00000564	-0.000026193	-0.000031833	-31.833	0.13614	0.000034846	0.13614	-1.9595E-06	0.00003567
571	315405	4029728	-7.5763E-06	-0.000032939	-4.05153E-05	-40.5153	0.098171	0	0.098171	-2.5926E-06	0
572	315406	4029774	-7.9013E-06	-0.000034443	-4.23443E-05	-42.3443	0.071303	0	0.071303	-2.7037E-06	0
573	315406	4029819	-7.9548E-06	-0.000035162	-4.31168E-05	-43.1168	0.040561	0	0.040561	-0.000002726	0
574	315407	4029865	-7.6408E-06	-0.000034772	-4.24128E-05	-42.4128	0.0069821	0	0.0069821	-2.6288E-06	0
575	315408	4029911	-7.0272E-06	-0.000033276	-4.03032E-05	-40.3032	0.000029543	0	0.000029543	-2.4325E-06	0
576	315408	4029956	-6.1649E-06	-0.00003047	-3.66349E-05	-36.6349	0	0.014879	0	-2.1577E-06	0.0047435
577	315409	4030002	-4.6234E-06	-0.00002476	-2.93834E-05	-29.3834	0	0.064746	0	-1.6737E-06	0.022293
578	315410	4030048	-2.8757E-06	-0.000018059	-2.09347E-05	-20.9347	0	0.11793	0	-1.1193E-06	0.044001
579	315410	4030093	-1.7031E-06	-0.000013239	-1.49421E-05	-14.9421	0	0.14803	0	-7.4228E-07	0.056446
580	315411	4030139	-1.0167E-06	-0.000010309	-1.13257E-05	-11.3257	0	0.16201	0	-5.1864E-07	0.062325
581	315366	4030187	-1.3026E-06	-0.00001082	-1.21226E-05	-12.1226	0	0.13438	0	-5.9034E-07	0.051476
582	315320	4030189	-0.000002245	-0.000013987	-0.000016232	-16.232	0	0.091402	0	-8.7425E-07	0.034425
583	315274	4030190	-3.3821E-06	-0.000017514	-2.08961E-05	-20.8961	0	0.039742	0	-0.000001217	0.014004
584	315228	4030192	-4.7429E-06	-0.000021901	-2.66439E-05	-26.6439	0	0	0	-1.6407E-06	0
585	315181	4030194	-6.3922E-06	-0.000027638	-3.40302E-05	-34.0302	0	0	0	-2.1808E-06	0
586	315135	4030196	-8.5984E-06	-0.000035331	-4.39294E-05	-43.9294	0	0	0	-2.9043E-06	0
587	315089	4030198	-0.000011589	-0.000045838	-0.000057427	-57.427	0	0	0	-3.8859E-06	0
588	315043	4030200	-0.000014855	-0.00005735	-0.000072205	-72.205	0	0	0	-4.9577E-06	0

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
1	313947	4027649	-8.8742E-08	-5.1517E-07	-6.03912E-07	-0.603912	0.012055	0.0005956	0.012055	-3.155E-08	0.00020035
2	314199	4027649	-9.0622E-08	-5.4973E-07	-6.40352E-07	-0.640352	0.015865	0.00076056	0.015865	-3.2462E-08	0.00025502
3	314450	4027649	-1.3665E-07	-6.9092E-07	-8.2757E-07	-0.82757	0.016215	0	0.016215	-4.7092E-08	0
4	314702	4027649	-2.0942E-07	-9.3668E-07	-1.1461E-06	-1.1461	0.011965	0	0.011965	-7.1096E-08	0
5	314954	4027649	-2.4861E-07	-1.1031E-06	-1.35171E-06	-1.35171	0.020564	0	0.020564	-8.4318E-08	0
6	315205	4027649	-2.6834E-07	-1.2051E-06	-1.47344E-06	-1.47344	0.012987	0	0.012987	-9.1103E-08	0
7	315457	4027649	-2.6253E-07	-1.2618E-06	-1.52433E-06	-1.52433	0.035022	0	0.035022	-8.9669E-08	0
8	315708	4027649	-0.000000341	-1.4818E-06	-1.8228E-06	-1.8228	0.037781	0	0.037781	-1.1532E-07	0
9	315960	4027649	-3.092E-07	-1.5424E-06	-1.8516E-06	-1.8516	0.035112	0	0.035112	-1.0609E-07	0
10	316212	4027649	-3.505E-07	-1.6871E-06	-2.0376E-06	-2.0376	0.03183	0	0.03183	-1.1995E-07	0
11	316463	4027649	-3.3148E-07	-0.000001678	-2.00948E-06	-2.00948	0.028566	0	0.028566	-1.143E-07	0
12	316715	4027649	-1.7753E-07	-1.4606E-06	-1.63813E-06	-1.63813	0.045805	0.0067879	0.045805	-6.9474E-08	0.0025955
13	316966	4027649	-1.0615E-07	-1.2913E-06	-1.39745E-06	-1.39745	0.052597	0.010745	0.052597	-4.8852E-08	0.0041855
14	317218	4027649	2.2051E-08	-9.3223E-07	-9.10179E-07	-0.910179	0.049013	0.016576	0.049013	-1.0442E-08	0.0065277
15	317469	4027649	2.0336E-07	-5.1648E-07	-3.1312E-07	-0.31312	0.031102	0.025753	0.031102	4.254E-08	0.010207
16	317721	4027649	2.7366E-07	-3.2069E-07	-4.703E-08	-0.04703	0.041272	0.029701	0.041272	6.2924E-08	0.011762
17	317973	4027649	4.1665E-07	-6.5412E-09	4.10109E-07	0.4101088	0.034834	0.03646	0.034834	0.000000105	0.014469
18	318224	4027649	3.7742E-07	1.3568E-08	3.90988E-07	0.390988	0.044829	0.033176	0.044829	9.5137E-08	0.013152
19	318476	4027649	2.9877E-07	-5.8151E-08	2.40619E-07	0.240619	0.038461	0.027681	0.038461	7.3915E-08	0.010968
20	318727	4027649	3.0696E-07	1.3891E-08	3.20851E-07	0.320851	0.035133	0.026826	0.035133	7.7595E-08	0.010618
21	318979	4027649	2.5917E-07	-1.2472E-08	2.46698E-07	0.246698	0.021673	0.023208	0.021673	6.4988E-08	0.0091914
22	313947	4027807	-1.1044E-07	-5.8184E-07	-6.9228E-07	-0.69228	0.0072263	0.000040688	0.0072263	-3.8427E-08	0.000016455
23	314199	4027807	-1.1193E-07	-6.2993E-07	-7.4186E-07	-0.74186	0.014611	0.00040935	0.014611	-3.9391E-08	0.00013903
24	314450	4027807	-1.3703E-07	-7.4748E-07	-8.8451E-07	-0.88451	0.016965	1.3013E-06	0.016965	-4.7628E-08	1.3184E-06
25	314702	4027807	-2.2473E-07	-1.0386E-06	-1.26333E-06	-1.26333	0.019295	0	0.019295	-7.6476E-08	0
26	314954	4027807	-2.8787E-07	-1.2559E-06	-1.54377E-06	-1.54377	0.012972	0	0.012972	-9.7469E-08	0
27	315205	4027807	-3.1848E-07	-1.4054E-06	-1.72388E-06	-1.72388	0.026056	0	0.026056	-1.0786E-07	0
28	315457	4027807	-3.1174E-07	-1.4858E-06	-1.79754E-06	-1.79754	0.039063	0	0.039063	-1.0635E-07	0
29	315708	4027807	-4.1133E-07	-1.7608E-06	-2.17213E-06	-2.17213	0.013179	0	0.013179	-1.3883E-07	0
30	315960	4027807	-0.000000381	-1.8419E-06	-2.2229E-06	-2.2229	0.039032	0	0.039032	-1.3021E-07	0
31	316212	4027807	-4.0822E-07	-1.9475E-06	-2.35572E-06	-2.35572	0.022594	0	0.022594	-1.3965E-07	0
32	316463	4027807	-3.5349E-07	-1.8539E-06	-2.20739E-06	-2.20739	0.041636	7.4397E-07	0.041636	-1.2248E-07	8.8861E-07
33	316715	4027807	-1.4667E-07	-1.5413E-06	-1.68797E-06	-1.68797	0.054636	0.010519	0.054636	-6.2885E-08	0.0040823
34	316966	4027807	-4.4677E-08	-1.2434E-06	-1.28808E-06	-1.288077	0.057718	0.015701	0.057718	-3.2763E-08	0.0061602
35	317218	4027807	0.000000153	-7.4301E-07	-5.9001E-07	-0.59001	0.057042	0.024996	0.057042	2.5903E-08	0.0098905
36	317469	4027807	3.5341E-07	-3.1206E-07	4.135E-08	0.04135	0.053083	0.03573	0.053083	8.3816E-08	0.014179
37	317721	4027807	4.5712E-07	-3.7326E-08	4.19794E-07	0.419794	0.046925	0.041013	0.046925	1.1423E-07	0.016271
38	317973	4027807	5.5868E-07	2.264E-07	7.8508E-07	0.78508	0.053651	0.045059	0.053651	1.4492E-07	0.017891
39	318224	4027807	4.1011E-07	6.695E-08	4.7706E-07	0.47706	0.048424	0.035745	0.048424	1.0389E-07	0.014171
40	318476	4027807	3.997E-07	1.2111E-07	5.2081E-07	0.52081	0.041708	0.033478	0.041708	1.0266E-07	0.013265
41	318727	4027807	3.5824E-07	1.1925E-07	4.7749E-07	0.47749	0.032279	0.029717	0.032279	9.2367E-08	0.011781
42	318979	4027807	3.0437E-07	6.6286E-08	3.70656E-07	0.370656	0.031656	0.025701	0.031656	7.7966E-08	0.010209
43	313947	4027966	-1.3291E-07	-6.5739E-07	-7.903E-07	-0.7903	0	0	0	-4.5867E-08	0
44	314199	4027966	-1.4709E-07	-7.4294E-07	-8.9003E-07	-0.89003	0.0080443	0	0.0080443	-5.0827E-08	0
45	314450	4027966	-1.6564E-07	-8.6259E-07	-1.02823E-06	-1.02823	0.01625	0	0.01625	-5.728E-08	0
46	314702	4027966	-2.3667E-07	-1.1555E-06	-1.39217E-06	-1.39217	0.021418	0	0.021418	-8.0942E-08	0
47	314954	4027966	-3.1904E-07	-1.4197E-06	-1.73874E-06	-1.73874	0.02195	0	0.02195	-1.0817E-07	0
48	315205	4027966	-3.8259E-07	-1.6574E-06	-2.03999E-06	-2.03999	0.033367	0	0.033367	-1.2928E-07	0
49	315457	4027966	-4.1339E-07	-1.8254E-06	-2.23879E-06	-2.23879	0.033409	0	0.033409	-1.399E-07	0
50	315708	4027966	-4.4475E-07	-2.0242E-06	-2.46895E-06	-2.46895	0.04597	0	0.04597	-1.5092E-07	0
51	315960	4027966	-4.9135E-07	-2.2349E-06	-2.72625E-06	-2.72625	0.04949	0	0.04949	-1.6681E-07	0
52	316212	4027966	-4.4913E-07	-2.1948E-06	-2.64393E-06	-2.64393	0.055823	0	0.055823	-1.5415E-07	0
53	316463	4027966	-3.6968E-07	-2.0507E-06	-2.42038E-06	-2.42038	0.056487	0.0010306	0.056487	-1.2951E-07	0.00035227
54	316715	4027966	-7.2042E-08	-0.000001524	-1.59604E-06	-1.596042	0.065539	0.016704	0.065539	-4.372E-08	0.0065511
55	316966	4027966	5.5587E-08	-1.1146E-06	-1.05901E-06	-1.059013	0.069809	0.02287	0.069809	-5.5656E-09	0.0090221
56	317218	4027966	3.2739E-07	-4.8716E-07	-1.5977E-07	-0.15977	0.044798	0.03611	0.044798	7.4352E-08	0.014321
57	317469	4027966	5.233E-07	-5.117E-08	4.7213E-07	0.47213	0.057504	0.046974	0.057504	1.307E-07	0.018653
58	317721	4027966	7.0851E-07	3.7428E-07	1.08279E-06	1.08279	0.045794	0.055778	0.045794	1.8523E-07	0.022164
59	317973	4027966	5.9744E-07	3.0858E-07	9.0602E-07	0.90602	0.053972	0.04829	0.053972	1.5528E-07	0.019156
60	318224	4027966	5.2615E-07	2.7556E-07	8.0171E-07	0.80171	0.044726	0.042558	0.044726	1.3683E-07	0.016878
61	318476	4027966	4.9302E-07	3.0934E-07	8.0236E-07	0.80236	0.045168	0.038496	0.045168	1.2969E-07	0.015273
62	318727	4027966	4.164E-07	2.1542E-07	6.3182E-07	0.63182	0.040109	0.033116	0.040109	1.0886E-07	0.013164
63	318979	4027966	2.7448E-07	7.6911E-10	2.75249E-07	0.27524911	0.029993	0.024321	0.029993	6.9189E-08	0.0096596
64	313947	4028124	-1.4556E-07	-7.2324E-07	-8.688E-07	-0.8688	0.0079959	0	0.0079959	-5.0211E-08	0
65	314199	4028124	-1.8084E-07	-8.6605E-07	-1.04689E-06	-1.04689	0.0031549	0	0.0031549	-6.2067E-08	0
66	314450	4028124	-2.1778E-07	-1.0358E-06	-1.25358E-06	-1.25358	0.0090054	0	0.0090054	-7.454E-08	0
67	314702	4028124	-2.8671E-07	-0.000001357	-1.64371E-06	-1.64371	0.022406	0	0.022406	-9.7767E-08	0
68	314954	4028124	-3.4376E-07	-1.6124E-06	-1.95616E-06	-1.95616	0.027996	0	0.027996	-1.1706E-07	0
69	315205	4028124	-4.5742E-07	-1.9757E-06	-2.43312E-06	-2.43312	0.03562	0	0.03562	-1.5441E-07	0
70	315457	4028124	-5.0789E-07	-2.2051E-06	-2.71299E-06	-2.71299	0.044916	0	0.044916	-1.7151E-07	0
71	315708	4028124	-5.332E-07	-2.4503E-06	-2.9835E-06	-2.9835	0.056674	0	0.056674	-1.8102E-07	0
72	315960	4028124	-6.2526E-07	-2.7023E-06	-3.32756E-06	-3.32756	0.057746	0	0.057746	-2.1126E-07	0
73	316212	4028124	-4.724E-07	-2.4582E-06	-2.9306E-06	-2.9306	0.067233	0	0.067233	-1.6338E-07	0
74	316463	4028124	-3.5842E-07	-2.2201E-06	-2.57852E-06	-2.57852	0.069093	0.004443	0.069093	-1.2948E-07	0.0016164
75	316715	4028124	7.0036E-08	-1.3676E-06	-1.29756E-06	-1.297564	0.078924	0.026639	0.078924	-5.1748E-09	0.010524
76	316966	4028124	2.2168E-07	-8.8771E-07	-6.6603E-07	-0.66603	0.070974	0.034374	0.070974	3.9786E-08	0.013598
77	317218	4028124	6.1511E-07	-4.9143E-08	5.65967E-07	0.565967	0.054073	0.054261	0.054073	1.5448E-07	0.02157

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
78	317469	4028124	7.9207E-07	3.8884E-07	1.18091E-06	1.18091	0.063975	0.063591	0.063975	2.0592E-07	0.02527
79	317721	4028124	9.1084E-07	7.315E-07	1.64234E-06	1.64234	0.059431	0.068132	0.059431	2.4216E-07	0.027058
80	317973	4028124	7.3203E-07	5.6661E-07	1.29864E-06	1.29864	0.062211	0.056277	0.062211	1.9354E-07	0.022342
81	318224	4028124	6.8421E-07	5.8709E-07	1.2713E-06	1.2713	0.054766	0.051003	0.054766	1.8257E-07	0.020247
82	318476	4028124	5.7137E-07	4.4638E-07	1.01775E-06	1.01775	0.048315	0.042875	0.048315	1.5214E-07	0.017056
83	318727	4028124	3.7719E-07	1.207E-07	4.9789E-07	0.49789	0.04188	0.031557	0.04188	9.7102E-08	0.012542
84	318979	4028124	2.7583E-07	-4.7482E-08	2.28348E-07	0.228348	0.034843	0.024958	0.034843	6.8924E-08	0.0099135
85	313947	4028282	-1.6101E-07	-8.0249E-07	-9.635E-07	-0.9635	0.0088235	0	0.0088235	-5.5475E-08	0
86	314199	4028282	-2.1007E-07	-9.9384E-07	-1.20391E-06	-1.20391	0.014594	0	0.014594	-7.1929E-08	0
87	314450	4028282	-2.7027E-07	-1.2397E-06	-1.50997E-06	-1.50997	0.014177	0	0.014177	-9.2062E-08	0
88	314702	4028282	-3.772E-07	-1.6616E-06	-2.0388E-06	-2.0388	0.0094656	0	0.0094656	-1.2769E-07	0
89	314954	4028282	-4.3052E-07	-1.9582E-06	-2.38872E-06	-2.38872	0.028616	0	0.028616	-1.4612E-07	0
90	315205	4028282	-5.2013E-07	-2.3473E-06	-2.86743E-06	-2.86743	0.042164	0	0.042164	-1.7613E-07	0
91	315457	4028282	-6.4218E-07	-2.7383E-06	-3.38048E-06	-3.38048	0.038991	0	0.038991	-2.1639E-07	0
92	315708	4028282	-7.1309E-07	-3.0837E-06	-3.79679E-06	-3.79679	0.063696	0	0.063696	-2.4063E-07	0
93	315960	4028282	-6.8864E-07	-3.1016E-06	-3.79024E-06	-3.79024	0.053581	0	0.053581	-2.337E-07	0
94	316212	4028282	-4.9698E-07	-2.7589E-06	-3.25588E-06	-3.25588	0.064484	0.00074067	0.064484	-1.7357E-07	0.00025811
95	316463	4028282	-2.8749E-07	-2.2859E-06	-2.57339E-06	-2.57339	0.069855	0.011571	0.069855	-1.1254E-07	0.0044614
96	316715	4028282	3.0536E-07	-1.0461E-06	-7.4074E-07	-0.74074	0.093396	0.042124	0.093396	5.9732E-08	0.016717
97	316966	4028282	5.437E-07	-3.9934E-07	1.4436E-07	0.14436	0.090846	0.055114	0.090846	1.2908E-07	0.021858
98	317218	4028282	1.0382E-06	6.4145E-07	1.67965E-06	1.67965	0.092379	0.079842	0.092379	2.734E-07	0.031794
99	317469	4028282	1.2076E-06	1.1054E-06	0.000002313	2.313	0.052702	0.087422	0.052702	3.2388E-07	0.034754
100	317721	4028282	9.3433E-07	8.641E-07	1.79843E-06	1.79843	0.056165	0.069435	0.056165	2.4946E-07	0.027569
101	317973	4028282	9.3394E-07	9.6414E-07	1.89808E-06	1.89808	0.052247	0.06729	0.052247	2.5167E-07	0.026722
102	318224	4028282	7.9759E-07	0.000000801	1.59859E-06	1.59859	0.058479	0.056845	0.058479	2.156E-07	0.02263
103	318476	4028282	5.1852E-07	3.1448E-07	0.000000833	0.833	0.049848	0.040963	0.049848	1.3609E-07	0.016294
104	318727	4028282	4.0332E-07	1.1744E-07	5.2076E-07	0.52076	0.043497	0.0334	0.043497	1.0406E-07	0.013285
105	318979	4028282	3.7184E-07	8.3879E-08	4.55719E-07	0.455719	0.039029	0.03051	0.039029	9.5976E-08	0.012141
106	313947	4028440	-1.5317E-07	-8.6385E-07	-1.01702E-06	-1.01702	0.0088201	0.00030275	0.0088201	-5.3676E-08	0.0001049
107	314199	4028440	-0.000000226	-1.1184E-06	-1.3444E-06	-1.3444	0.014985	0	0.014985	-7.7672E-08	0
108	314450	4028440	-3.3288E-07	-1.5014E-06	-1.83428E-06	-1.83428	0.019512	0	0.019512	-1.1306E-07	0
109	314702	4028440	-4.6947E-07	-2.0252E-06	-2.49467E-06	-2.49467	0.020302	0	0.020302	-1.5848E-07	0
110	314954	4028440	-5.9389E-07	-2.5203E-06	-3.11419E-06	-3.11419	0.00862	0	0.00862	-2.0008E-07	0
111	315205	4028440	-6.788E-07	-2.9744E-06	-3.6532E-06	-3.6532	0.042603	0	0.042603	-2.2915E-07	0
112	315457	4028440	-7.685E-07	-3.3938E-06	-4.1623E-06	-4.1623	0.055239	0	0.055239	-2.5952E-07	0
113	315708	4028440	-8.7765E-07	-3.7575E-06	-4.63515E-06	-4.63515	0.070382	0	0.070382	-2.9586E-07	0
114	315960	4028440	-7.4654E-07	-3.5794E-06	-4.32594E-06	-4.32594	0.087637	0	0.087637	-2.5508E-07	0
115	316212	4028440	-5.7904E-07	-3.1573E-06	-3.73634E-06	-3.73634	0.099876	0.0007828	0.099876	-2.0206E-07	0.00027457
116	316463	4028440	-1.3075E-07	-2.1769E-06	-2.30765E-06	-2.30765	0.10971	0.023898	0.10971	-7.1321E-08	0.0093892
117	316715	4028440	7.0245E-07	-4.4948E-07	2.5297E-07	0.25297	0.10824	0.067609	0.10824	1.6992E-07	0.026886
118	316966	4028440	1.1259E-06	5.3099E-07	1.65689E-06	1.65689	0.11237	0.090633	0.11237	2.9232E-07	0.036051
119	317218	4028440	1.6017E-06	1.6086E-06	3.2103E-06	3.2103	0.080293	0.11377	0.080293	4.321E-07	0.045294
120	317469	4028440	1.3079E-06	1.4158E-06	2.7237E-06	2.7237	0.046011	0.092699	0.046011	3.5347E-07	0.03682
121	317721	4028440	7.9837E-07	8.7525E-07	1.67362E-06	1.67362	0.017967	0.056211	0.017967	2.1633E-07	0.022355
122	317973	4028440	8.9036E-07	9.7114E-07	1.8615E-06	1.8615	0.035127	0.062376	0.035127	2.4179E-07	0.024832
123	318224	4028440	7.3335E-07	6.5618E-07	1.38953E-06	1.38953	0.04992	0.054306	0.04992	1.9634E-07	0.021625
124	318476	4028440	6.1643E-07	4.4219E-07	1.05862E-06	1.05862	0.052288	0.046569	0.052288	1.6375E-07	0.018553
125	318727	4028440	5.2314E-07	3.1731E-07	8.4045E-07	0.84045	0.047706	0.039959	0.047706	1.3832E-07	0.015922
126	318979	4028440	3.8887E-07	1.4554E-07	5.3441E-07	0.53441	0.041098	0.031651	0.041098	1.0087E-07	0.012602
127	313947	4028599	-1.8211E-07	-9.9587E-07	-1.17798E-06	-1.17798	0.0082784	0.0001371	0.0082784	-6.3476E-08	0.000051019
128	314199	4028599	-2.4495E-07	-1.2741E-06	-1.51905E-06	-1.51905	0.013891	0	0.013891	-8.4574E-08	0
129	314450	4028599	-3.7722E-07	-0.000001788	-2.16522E-06	-2.16522	0.017712	0	0.017712	-1.2857E-07	0
130	314702	4028599	-5.7023E-07	-2.4839E-06	-3.05413E-06	-3.05413	0.022495	0	0.022495	-1.9251E-07	0
131	314954	4028599	-7.7625E-07	-3.2425E-06	-4.01875E-06	-4.01875	0.034176	0	0.034176	-2.6085E-07	0
132	315205	4028599	-9.4713E-07	-3.9283E-06	-4.87543E-06	-4.87543	0.027532	0	0.027532	-3.1796E-07	0
133	315457	4028599	-0.000001014	-4.3834E-06	-5.3974E-06	-5.3974	0.064759	0	0.064759	-3.4168E-07	0
134	315708	4028599	-1.0057E-06	-4.4961E-06	-5.5018E-06	-5.5018	0.077962	0	0.077962	-3.4043E-07	0
135	315960	4028599	-9.342E-07	-4.3139E-06	-5.2481E-06	-5.2481	0.10227	0	0.10227	-3.1822E-07	0
136	316212	4028599	-6.2683E-07	-3.4801E-06	-4.10693E-06	-4.10693	0.089288	0.0032123	0.089288	-2.2093E-07	0.0010828
137	316463	4028599	1.5845E-07	-1.7972E-06	-1.63875E-06	-1.63875	0.12881	0.044496	0.12881	7.1281E-09	0.017622
138	316715	4028599	1.4054E-06	6.5157E-07	2.05697E-06	2.05697	0.12937	0.11148	0.12937	3.6618E-07	0.044409
139	316966	4028599	1.8185E-06	1.7612E-06	3.5797E-06	3.5797	0.076248	0.1293	0.076248	4.8991E-07	0.051541
140	317218	4028599	0.000002715	3.5659E-06	6.2809E-06	6.2809	0.093478	0.1772	0.093478	7.4866E-07	0.07055
141	317469	4028599	1.1367E-06	1.4592E-06	2.5959E-06	2.5959	0.019749	0.076092	0.019749	3.1201E-07	0.030313
142	317721	4028599	7.1653E-07	9.1995E-07	1.63648E-06	1.63648	0.012074	0.048025	0.012074	1.9685E-07	0.01916
143	317973	4028599	8.0123E-07	8.7601E-07	1.67724E-06	1.67724	0.027627	0.056178	0.027627	2.1773E-07	0.022404
144	318224	4028599	9.3175E-07	9.7346E-07	1.90521E-06	1.90521	0.061419	0.065174	0.061419	0.000000253	0.026002
145	318476	4028599	7.2701E-07	6.5995E-07	1.38696E-06	1.38696	0.055604	0.052419	0.055604	1.9577E-07	0.020912
146	318727	4028599	5.4622E-07	3.9824E-07	9.4446E-07	0.94446	0.049332	0.041429	0.049332	1.4499E-07	0.016512
147	318979	4028599	3.8543E-07	1.6008E-07	5.4551E-07	0.54551	0.0425	0.031829	0.0425	9.9681E-08	0.012663
148	313947	4028757	-2.238E-07	-1.1768E-06	-1.4006E-06	-1.4006	0.0077509	1.2727E-06	0.0077509	-7.762E-08	1.3415E-06
149	314199	4028757	-3.1606E-07	-1.5583E-06	-1.87436E-06	-1.87436	0.012023	0	0.012023	-1.085E-07	0
150	314450	4028757	-4.9407E-07	-2.2587E-06	-2.75277E-06	-2.75277	0.016622	0	0.016622	-1.6771E-07	0
151	314702	4028757	-7.1959E-07	-3.1653E-06	-3.88489E-06	-3.88489	0.023512	0	0.023512	-2.4286E-07	0
152	314954	4028757	-9.9768E-07	-0.000004253	-5.25068E-06	-5.25068	0.035965	0	0.035965	-3.3544E-07	0
153	315205	4028757	-1.2636E-06	-5.2272E-06	-6.4908E-06	-6.4908	0.050897	0	0.050897	-4.2367E-07	0
154	315457	4028757	-1.3742E-06	-5.7153E-06	-7.0895E-06	-7.0895	0.065642	0	0.065642	-4.6144E-07	0

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
155	315708	4028757	-1.2614E-06	-5.6339E-06	-6.8953E-06	-6.8953	0.091798	0	0.091798	-4.271E-07	0
156	315960	4028757	-9.5973E-07	-4.8145E-06	-5.77423E-06	-5.77423	0.1108	0	0.1108	-3.3028E-07	0
157	316212	4028757	-3.0106E-07	-3.2632E-06	-3.56426E-06	-3.56426	0.15674	0.026818	0.15674	-1.3348E-07	0.010554
158	316463	4028757	7.492E-07	-9.222E-07	-0.000000173	-0.173	0.18104	0.084196	0.18104	1.6968E-07	0.033476
159	316715	4028757	0.000002877	3.1128E-06	5.9898E-06	5.9898	0.19483	0.1995	0.19483	7.8073E-07	0.079597
160	316966	4028757	4.5448E-06	6.3409E-06	1.08857E-05	10.8857	0.18855	0.28795	0.18855	1.2615E-06	0.11486
161	317218	4028757	3.4883E-06	0.000005067	8.5553E-06	8.5553	0.094354	0.22298	0.094354	9.6804E-07	0.088748
162	317469	4028757	1.1061E-06	1.6177E-06	2.7238E-06	2.7238	0.014035	0.071005	0.014035	3.0712E-07	0.028338
163	317721	4028757	7.5637E-07	1.0942E-06	1.85057E-06	1.85057	0.015111	0.048463	0.015111	2.1038E-07	0.019389
164	317973	4028757	8.6621E-07	1.0455E-06	1.91171E-06	1.91171	0.024257	0.058611	0.024257	2.3753E-07	0.023413
165	318224	4028757	1.0236E-06	1.2019E-06	2.2255E-06	2.2255	0.067214	0.069681	0.067214	2.8027E-07	0.02783
166	318476	4028757	7.1495E-07	6.9316E-07	1.40811E-06	1.40811	0.063317	0.052327	0.063317	1.922E-07	0.020862
167	318727	4028757	4.6544E-07	3.037E-07	7.6914E-07	0.76914	0.054631	0.037073	0.054631	1.2211E-07	0.014765
168	318979	4028757	3.465E-07	1.5255E-07	4.9905E-07	0.49905	0.046844	0.028338	0.046844	9.0075E-08	0.011294
169	313947	4028915	-2.8997E-07	-1.4349E-06	-1.72487E-06	-1.72487	0.0015411	0	0.0015411	-9.9749E-08	0
170	314199	4028915	-4.2233E-07	-1.9668E-06	-2.38913E-06	-2.38913	0.0062077	0	0.0062077	-1.4407E-07	0
171	314450	4028915	-6.8013E-07	-2.9708E-06	-3.65093E-06	-3.65093	0.015229	0	0.015229	-2.2978E-07	0
172	314702	4028915	-0.000001052	-4.4128E-06	-5.4648E-06	-5.4648	0.022071	0	0.022071	-3.5327E-07	0
173	314954	4028915	-1.4663E-06	-6.0443E-06	-7.5106E-06	-7.5106	0.036373	0	0.036373	-4.9107E-07	0
174	315205	4028915	-1.6811E-06	-7.0271E-06	-8.7082E-06	-8.7082	0.055913	0	0.055913	-5.6384E-07	0
175	315457	4028915	-1.7153E-06	-7.3765E-06	-9.0918E-06	-9.0918	0.072651	0	0.072651	-5.774E-07	0
176	315708	4028915	-1.5685E-06	-6.9678E-06	-8.5363E-06	-8.5363	0.098731	0	0.098731	-5.3109E-07	0
177	315960	4028915	-9.3849E-07	-5.3014E-06	-6.23989E-06	-6.23989	0.12765	0.0036139	0.12765	-3.3038E-07	0.001225
178	316212	4028915	1.3381E-09	-2.9798E-06	-2.97846E-06	-2.9784619	0.17284	0.053241	0.17284	-5.575E-08	0.021097
179	316463	4028915	1.8915E-06	1.0213E-06	2.9128E-06	2.9128	0.25169	0.15855	0.25169	4.8704E-07	0.063227
180	316715	4028915	6.8048E-06	9.7608E-06	1.65656E-05	16.5656	0.27474	0.42445	0.27474	1.8951E-06	0.16954
181	316966	4028915	9.7249E-06	0.000015082	2.48069E-05	24.8069	0.25861	0.58095	0.25861	2.7337E-06	0.23179
182	317218	4028915	5.4559E-06	8.5634E-06	1.40193E-05	14.0193	0.13519	0.33744	0.13519	1.5262E-06	0.13448
183	317469	4028915	1.4626E-06	2.3172E-06	3.7798E-06	3.7798	0.017021	0.090991	0.017021	4.0964E-07	0.036415
184	317721	4028915	6.9739E-07	1.0784E-06	1.77579E-06	1.77579	0.013902	0.04366	0.013902	1.9538E-07	0.017507
185	317973	4028915	6.4302E-07	8.4925E-07	1.49227E-06	1.49227	0.02232	0.04245	0.02232	1.7787E-07	0.01699
186	318224	4028915	9.4255E-07	1.1535E-06	2.09605E-06	2.09605	0.078423	0.065577	0.078423	2.5744E-07	0.026184
187	318476	4028915	6.6402E-07	6.8183E-07	1.34585E-06	1.34585	0.067618	0.047862	0.067618	1.795E-07	0.019119
188	318727	4028915	4.9083E-07	4.1401E-07	9.0484E-07	0.90484	0.051665	0.036163	0.051665	1.3171E-07	0.014448
189	318979	4028915	3.7894E-07	2.3917E-07	6.1811E-07	0.61811	0.051935	0.028916	0.051935	1.0049E-07	0.011543
190	313947	4029074	-3.4208E-07	-1.7533E-06	-2.09538E-06	-2.09538	0	0	0	-1.1788E-07	0
191	314199	4029074	-5.2769E-07	-2.4793E-06	-3.00699E-06	-3.00699	0.0045452	0	0.0045452	-1.7971E-07	0
192	314450	4029074	-9.6806E-07	-0.000004138	-5.10606E-06	-5.10606	0.010222	0	0.010222	-3.2573E-07	0
193	314702	4029074	-0.000001655	-6.7075E-06	-8.3625E-06	-8.3625	0.018021	0	0.018021	-5.5334E-07	0
194	314954	4029074	-2.3092E-06	-9.1994E-06	-1.15086E-05	-11.5086	0.034156	0	0.034156	-7.705E-07	0
195	315205	4029074	-2.4927E-06	-0.000010078	-1.25707E-05	-12.5707	0.056721	0	0.056721	-8.3355E-07	0
196	315457	4029074	-2.3217E-06	-9.8505E-06	-1.21722E-05	-12.1722	0.074824	0	0.074824	-7.8093E-07	0
197	315708	4029074	-1.6789E-06	-8.1678E-06	-9.8467E-06	-9.8467	0.1036	0	0.1036	-5.741E-07	0
198	315960	4029074	-5.042E-07	-5.2276E-06	-5.7318E-06	-5.7318	0.14795	0.03841	0.14795	-2.177E-07	0.015135
199	316212	4029074	1.1812E-06	-1.0276E-06	1.536E-07	0.1536	0.18726	0.13466	0.18726	2.6809E-07	0.053584
200	316463	4029074	4.5927E-06	6.0076E-06	1.06003E-05	10.6003	0.39673	0.32668	0.39673	1.2455E-06	0.13057
201	316715	4029074	7.6668E-06	0.000012928	2.05948E-05	20.5948	0.18946	0.46152	0.18946	2.1606E-06	0.18458
202	316966	4029074	1.5303E-06	2.7164E-06	4.2467E-06	4.2467	0.026636	0.090213	0.026636	4.3507E-07	0.03623
203	317218	4029074	8.1802E-07	1.3625E-06	2.18052E-06	2.18052	0.018086	0.048801	0.018086	2.3201E-07	0.019605
204	317469	4029074	0.000000737	1.0009E-06	1.7379E-06	1.7379	0.026125	0.047573	0.026125	2.0494E-07	0.019069
205	317721	4029074	9.7037E-07	1.2965E-06	2.26687E-06	2.26687	0.085567	0.063433	0.085567	2.6908E-07	0.025398
206	317973	4029074	6.8079E-07	7.6562E-07	1.44641E-06	1.44641	0.072856	0.046642	0.072856	1.8639E-07	0.018651
207	318224	4029074	4.753E-07	3.976E-07	8.729E-07	0.8729	0.057267	0.035008	0.057267	1.275E-07	0.013972
208	318476	4029074	3.3391E-07	1.5879E-07	4.927E-07	0.4927	0.051897	0.026828	0.051897	8.7199E-08	0.010688
209	313947	4029232	-4.423E-07	-2.2801E-06	-2.7224E-06	-2.7224	0	0	0	-1.5232E-07	0
210	314199	4029232	-6.8892E-07	-3.2767E-06	-3.96562E-06	-3.96562	0	0	0	-2.3461E-07	0
211	314450	4029232	-1.5011E-06	-6.3351E-06	-7.8362E-06	-7.8362	0.0027954	0	0.0027954	-5.0348E-07	0
212	314702	4029232	-3.0044E-06	-0.000011919	-1.49234E-05	-14.9234	0.0080991	0	0.0080991	-1.0004E-06	0
213	315205	4029232	-3.4281E-06	-0.000014162	-1.75901E-05	-17.5901	0.061545	0	0.061545	-1.1483E-06	0
214	315457	4029232	-2.9119E-06	-0.000012908	-1.58199E-05	-15.8199	0.077795	0	0.077795	-9.835E-07	0
215	315708	4029232	-1.5517E-06	-9.1083E-06	-0.00001066	-10.66	0.10822	0.0048092	0.10822	-5.4779E-07	0.0016561
216	315960	4029232	8.3512E-07	-3.2895E-06	-2.45438E-06	-2.45438	0.15801	0.13045	0.15801	1.4858E-07	0.051892
217	317218	4029232	8.2147E-06	0.000015963	2.41777E-05	24.1777	0.22969	0.47244	0.22969	2.3492E-06	0.19001
218	317469	4029232	2.2396E-06	4.3909E-06	6.6305E-06	6.6305	0.04541	0.12171	0.04541	6.4882E-07	0.04907
219	317721	4029232	1.1042E-06	1.8762E-06	2.9804E-06	2.9804	0.039865	0.064896	0.039865	3.1459E-07	0.026088
220	317973	4029232	1.3227E-06	2.1053E-06	0.000003428	3.428	0.11206	0.080314	0.11206	3.7378E-07	0.032218
221	318224	4029232	8.5302E-07	1.1147E-06	1.96772E-06	1.96772	0.093499	0.056386	0.093499	2.3606E-07	0.02257
222	318476	4029232	5.7963E-07	5.7601E-07	1.15564E-06	1.15564	0.077281	0.041627	0.077281	1.5682E-07	0.016635
223	318727	4029232	4.0296E-07	2.6088E-07	6.6384E-07	0.66384	0.063029	0.031316	0.063029	1.0647E-07	0.012498
224	318979	4029232	2.9402E-07	7.9858E-08	3.73878E-07	0.373878	0.05393	0.024615	0.05393	7.5774E-08	0.0098137
225	313947	4029390	-7.4089E-07	-3.3489E-06	-4.08979E-06	-4.08979	0	0	0	-2.5142E-07	0
226	314199	4029390	-1.1976E-06	-5.1114E-06	-0.000006309	-6.309	0	0	0	-4.0304E-07	0
227	314450	4029390	-3.2115E-06	-0.0000125	-1.57115E-05	-15.7115	0	0	0	-1.0673E-06	0
228	315457	4029390	-3.9342E-06	-0.000017178	-2.11122E-05	-21.1122	0.089444	0	0.089444	-1.3292E-06	0
229	315708	4029390	-1.2802E-06	-9.7224E-06	-1.10026E-05	-11.0026	0.12242	0.044689	0.12242	-4.9584E-07	0.017736
230	317469	4029390	3.4297E-06	8.0881E-06	1.15178E-05	11.5178	0.20322	0.1568	0.20322	1.0293E-06	0.063732
231	317721	4029390	1.6335E-06	3.1015E-06	0.000004735	4.735	0.1461	0.092176	0.1461	4.7124E-07	0.037122

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
232	317973	4029390	9.4214E-07	1.3989E-06	2.34104E-06	2.34104	0.11776	0.061314	0.11776	0.000000263	0.02458
233	318224	4029390	6.0384E-07	6.5655E-07	1.26039E-06	1.26039	0.095901	0.043606	0.095901	1.6388E-07	0.017436
234	318476	4029390	4.0991E-07	2.7067E-07	6.8058E-07	0.68058	0.082554	0.032463	0.082554	1.0811E-07	0.012957
235	318727	4029390	2.8955E-07	5.2542E-08	3.42092E-07	0.342092	0.069177	0.025116	0.069177	7.3961E-08	0.010011
236	318979	4029390	2.1366E-07	-7.2244E-08	1.41416E-07	0.141416	0.056911	0.020285	0.056911	5.2658E-08	0.0080762
237	313947	4029548	-1.2693E-06	-5.3298E-06	-6.5991E-06	-6.5991	0	0	0	-4.2613E-07	0
238	314199	4029548	-2.5011E-06	-9.8848E-06	-1.23859E-05	-12.3859	0	0	0	-8.3319E-07	0
239	317469	4029548	2.2784E-06	5.1526E-06	0.000007431	7.431	0.17205	0.10381	0.17205	6.8411E-07	0.042166
240	317721	4029548	1.0009E-06	1.6837E-06	2.6846E-06	2.6846	0.14532	0.059713	0.14532	2.8591E-07	0.024036
241	317973	4029548	5.4553E-07	5.729E-07	1.11843E-06	1.11843	0.11652	0.0392	0.11652	1.4878E-07	0.015709
242	318224	4029548	3.4339E-07	1.3051E-07	4.739E-07	0.4739	0.089601	0.028734	0.089601	8.9294E-08	0.011484
243	318476	4029548	2.2173E-07	-9.9378E-08	1.22352E-07	0.122352	0.08145	0.021604	0.08145	5.4366E-08	0.0086153
244	318727	4029548	1.4352E-07	-2.2135E-07	-7.783E-08	-0.07783	0.062138	0.016631	0.062138	3.2377E-08	0.0066172
245	318979	4029548	9.7887E-08	-2.7849E-07	-1.80603E-07	-0.180603	0.046875	0.013533	0.046875	1.9776E-08	0.0053738
246	313947	4029707	-2.4472E-06	-9.5702E-06	-1.20174E-05	-12.0174	0	0	0	-8.1421E-07	0
247	314199	4029707	-6.9271E-06	-0.000025805	-3.27321E-05	-32.7321	0	0	0	-2.2893E-06	0
248	315457	4029707	-0.000005971	-0.000027	-0.000032971	-32.971	0.049979	0	0.049979	-2.0221E-06	0
249	315708	4029707	1.8971E-06	-4.6165E-06	-2.7194E-06	-2.7194	0.095089	0.2944	0.095089	3.5183E-07	0.11734
250	315960	4029707	0.000011335	0.000018819	0.000030154	30.154	0.14372	0.87234	0.14372	3.0453E-06	0.34697
251	316212	4029707	0.000015929	0.000029701	0.00004563	45.63	0.20769	1.1258	0.20769	4.3736E-06	0.44813
252	316463	4029707	0.000014307	0.000028085	0.000042392	42.392	0.18932	0.97912	0.18932	3.9618E-06	0.3908
253	316715	4029707	0.000010977	0.000023168	0.000034145	34.145	0.24363	0.66737	0.24363	3.1241E-06	0.26766
254	316966	4029707	8.9892E-06	0.00002509	3.40792E-05	34.0792	0.20892	0.29672	0.20892	2.8212E-06	0.12231
255	317218	4029707	3.2841E-06	8.4961E-06	1.17802E-05	11.7802	0.16745	0.11739	0.16745	1.0206E-06	0.048276
256	317469	4029707	1.1825E-06	2.0627E-06	3.2452E-06	3.2452	0.1351	0.065539	0.1351	3.4234E-07	0.026424
257	317721	4029707	7.0401E-07	7.0371E-07	1.40772E-06	1.40772	0.11879	0.047957	0.11879	1.9326E-07	0.019236
258	317973	4029707	3.2004E-07	-4.2948E-08	2.77092E-07	0.277092	0.088286	0.028137	0.088286	8.1206E-08	0.011232
259	318224	4029707	1.5586E-07	-3.0406E-07	-1.482E-07	-0.1482	0.078573	0.0187	0.078573	3.4413E-08	0.007433
260	318476	4029707	8.5546E-08	-3.9633E-07	-3.10784E-07	-0.310784	0.061531	0.014137	0.061531	1.48E-08	0.0056028
261	318727	4029707	4.3198E-08	-4.2916E-07	-3.85962E-07	-0.385962	0.06367	0.010951	0.06367	3.4461E-09	0.0043292
262	318979	4029707	2.4684E-08	-4.2405E-07	-3.99366E-07	-0.399366	0.049682	0.0091776	0.049682	-1.1431E-09	0.0036231
263	313947	4029865	-4.2088E-06	-0.000016033	-2.02418E-05	-20.2418	0	0	0	-1.3955E-06	0
264	314199	4029865	-0.000010964	-0.000040516	-0.00005148	-51.48	0	0	0	-3.6208E-06	0
265	315457	4029865	-5.6657E-06	-0.000027527	-3.31927E-05	-33.1927	0.00010056	0	0.00010056	-1.9341E-06	0
266	315708	4029865	1.9929E-06	-3.4785E-06	-1.4856E-06	-1.4856	0.035632	0.27084	0.035632	4.0771E-07	0.10745
267	315960	4029865	5.7293E-06	0.000007514	1.32433E-05	13.2433	0.085752	0.4581	0.085752	1.5152E-06	0.18225
268	316212	4029865	8.3463E-06	0.000013918	2.22643E-05	22.2643	0.14282	0.57801	0.14282	2.2928E-06	0.23041
269	316463	4029865	6.2264E-06	0.000011635	1.78614E-05	17.8614	0.14154	0.41788	0.14154	1.7313E-06	0.16701
270	316715	4029865	5.1101E-06	0.000010288	1.53981E-05	15.3981	0.15288	0.29555	0.15288	1.4667E-06	0.11876
271	316966	4029865	3.6255E-06	7.5155E-06	0.000011141	11.141	0.15952	0.18817	0.15952	1.0617E-06	0.07586
272	317218	4029865	1.8308E-06	3.6277E-06	5.4585E-06	5.4585	0.14641	0.092662	0.14641	5.3876E-07	0.037486
273	317469	4029865	7.5118E-07	9.6507E-07	1.71625E-06	1.71625	0.10008	0.048329	0.10008	2.1023E-07	0.019432
274	317721	4029865	3.7819E-07	1.1699E-07	4.9518E-07	0.49518	0.083143	0.031389	0.083143	9.8384E-08	0.012525
275	317973	4029865	3.1098E-07	-3.6164E-08	2.74816E-07	0.274816	0.086049	0.026571	0.086049	7.9417E-08	0.010603
276	318224	4029865	1.9179E-07	-2.6266E-07	-7.087E-08	-0.07087	0.075677	0.019801	0.075677	4.5011E-08	0.0078865
277	318476	4029865	6.506E-08	-4.4203E-07	-3.7697E-07	-0.37697	0.054887	0.012405	0.054887	9.172E-09	0.0049092
278	318727	4029865	3.3514E-09	-5.0324E-07	-4.99889E-07	-0.4998886	0.041346	0.0083656	0.041346	-7.8001E-09	0.0032877
279	318979	4029865	-1.0401E-08	-4.7696E-07	-4.87361E-07	-0.487361	0.051974	0.0066875	0.051974	-1.0815E-08	0.0026215
280	313947	4030023	-5.8257E-06	-0.000022068	-2.78937E-05	-27.8937	0	0	0	-0.000001931	0
281	315457	4030023	-2.7959E-06	-0.000016678	-1.94739E-05	-19.4739	0	0.021571	0	-9.9974E-07	0.0072098
282	315708	4030023	1.6653E-06	-1.9081E-06	-2.428E-07	-0.2428	0.00034161	0.20772	0.00034161	3.606E-07	0.082309
283	315960	4030023	3.8611E-06	4.5262E-06	8.3873E-06	8.3873	0.052771	0.30121	0.052771	1.0243E-06	0.11995
284	316212	4030023	4.5479E-06	7.1078E-06	1.16557E-05	11.6557	0.08616	0.31593	0.08616	1.2473E-06	0.12605
285	316463	4030023	3.3678E-06	5.8711E-06	9.2389E-06	9.2389	0.09415	0.22609	0.09415	9.3538E-07	0.090403
286	316715	4030023	2.9466E-06	5.5979E-06	8.5445E-06	8.5445	0.10137	0.17105	0.10137	8.4427E-07	0.068723
287	316966	4030023	0.000002001	3.4793E-06	5.4803E-06	5.4803	0.092229	0.12048	0.092229	5.6803E-07	0.048327
288	317218	4030023	1.1556E-06	1.8781E-06	3.0337E-06	3.0337	0.084485	0.069571	0.084485	3.2835E-07	0.02796
289	317469	4030023	6.3433E-07	7.1379E-07	1.34812E-06	1.34812	0.097063	0.043093	0.097063	1.7485E-07	0.017286
290	317721	4030023	3.1574E-07	4.2685E-08	3.58425E-07	0.358425	0.070615	0.027137	0.070615	8.1043E-08	0.010842
291	317973	4030023	1.7972E-07	-2.0476E-07	-2.504E-08	-0.02504	0.054302	0.019849	0.054302	4.1563E-08	0.0078918
292	318224	4030023	1.507E-07	-2.269E-07	-7.62E-08	-0.0762	0.063611	0.01661	0.063611	3.4579E-08	0.0065987
293	318476	4030023	1.3304E-07	-2.523E-07	-1.1926E-07	-0.11926	0.059022	0.014689	0.059022	3.0142E-08	0.0058452
294	318727	4030023	7.7479E-08	-3.3175E-07	-2.54271E-07	-0.254271	0.049259	0.011204	0.049259	1.4556E-08	0.0044501
295	318979	4030023	7.9072E-09	-4.1479E-07	-4.06883E-07	-0.4068828	0.037723	0.0069869	0.037723	-4.888E-09	0.0027535
296	313947	4030182	-6.9524E-06	-0.000026213	-3.31654E-05	-33.1654	0	0	0	-2.3055E-06	0
297	315457	4030182	-4.5586E-07	-6.9565E-06	-7.41236E-06	-7.41236	0	0.080887	0	-2.4579E-07	0.031475
298	315708	4030182	1.8204E-06	3.6938E-07	2.18978E-06	2.18978	0.00029539	0.1737	0.00029539	4.4931E-07	0.069002
299	315960	4030182	3.0571E-06	0.000003953	7.0101E-06	7.0101	0.038409	0.22162	0.038409	8.268E-07	0.08835
300	316212	4030182	2.6057E-06	4.0235E-06	6.6292E-06	6.6292	0.043307	0.18292	0.043307	7.1383E-07	0.07305
301	316463	4030182	2.1072E-06	3.5613E-06	5.6685E-06	5.6685	0.06526	0.13949	0.06526	5.868E-07	0.055818
302	316715	4030182	1.8961E-06	3.3561E-06	5.2522E-06	5.2522	0.060106	0.11553	0.060106	5.3732E-07	0.046318
303	316966	4030182	1.3676E-06	0.000002185	3.5526E-06	3.5526	0.07346	0.087551	0.07346	3.8264E-07	0.035065
304	317218	4030182	1.0209E-06	1.5266E-06	2.5475E-06	2.5475	0.044287	0.064376	0.044287	2.8613E-07	0.025792
305	317469	4030182	6.3087E-07	0.000000772	1.40287E-06	1.40287	0.083021	0.041677	0.083021	1.7472E-07	0.016701
306	317721	4030182	3.3419E-07	1.8661E-07	5.208E-07	0.5208	0.070183	0.026105	0.070183	8.8402E-08	0.010432
307	317973	4030182	1.8543E-07	-1.035E-07	8.193E-08	0.08193	0.051284	0.018445	0.051284	4.4922E-08	0.0073451
308	318224	4030182	1.1035E-07	-2.2725E-07	-1.169E-07	-0.1169	0.041807	0.014051	0.041807	2.3507E-08	0.0055787

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
309	318476	4030182	8.5484E-08	-2.4175E-07	-1.56266E-07	-0.156266	0.046489	0.011782	0.046489	1.7207E-08	0.0046671
310	318727	4030182	9.7294E-08	-2.085E-07	-1.11206E-07	-0.111206	0.045372	0.011454	0.045372	2.1369E-08	0.0045477
311	318979	4030182	7.6343E-08	-2.394E-07	-1.63057E-07	-0.163057	0.035124	0.0097675	0.035124	1.575E-08	0.003882
312	313947	4030340	-7.2791E-06	-0.00002739	-3.46691E-05	-34.6691	0	0	0	-2.4153E-06	0
313	314199	4030340	-0.000011381	-0.00004241	-0.000053791	-53.791	0	0	0	-0.000003774	0
314	314450	4030340	-0.000014384	-0.000053782	-0.000068166	-68.166	0	0	0	-4.7748E-06	0
315	314702	4030340	-0.00001298	-0.000049321	-0.000062301	-62.301	0	0	0	-4.3153E-06	0
316	314954	4030340	-7.4155E-06	-0.0000297	-3.71155E-05	-37.1155	0	0	0	-2.4774E-06	0
317	315205	4030340	-2.8004E-06	-0.000013577	-1.63774E-05	-16.3774	0	0	0	-9.5982E-07	0
318	315457	4030340	8.7895E-08	-3.9695E-06	-3.88161E-06	-3.881605	0.000099698	0.0793	0.000099698	-5.4503E-08	0.031256
319	315708	4030340	1.4556E-06	3.475E-07	1.8031E-06	1.8031	0.0003958	0.13373	0.0003958	3.6338E-07	0.053132
320	315960	4030340	2.1192E-06	2.4552E-06	4.5744E-06	4.5744	0.031549	0.15562	0.031549	5.7015E-07	0.062056
321	316212	4030340	1.5677E-06	2.1661E-06	3.7338E-06	3.7338	0.0060611	0.11424	0.0060611	4.2539E-07	0.045625
322	316463	4030340	1.4082E-06	2.2494E-06	3.6576E-06	3.6576	0.045065	0.093098	0.045065	3.9198E-07	0.037272
323	316715	4030340	1.2701E-06	2.0031E-06	3.2732E-06	3.2732	0.044133	0.083171	0.044133	3.5363E-07	0.033277
324	316966	4030340	1.0233E-06	1.5363E-06	2.5596E-06	2.5596	0.05202	0.068003	0.05202	2.8358E-07	0.027207
325	317218	4030340	8.8071E-07	1.2775E-06	2.15821E-06	2.15821	0.05552	0.056814	0.05552	2.4524E-07	0.022727
326	317469	4030340	4.7055E-07	5.468E-07	1.01735E-06	1.01735	0.042605	0.032985	0.042605	1.2862E-07	0.013193
327	317721	4030340	3.2748E-07	2.3538E-07	5.6286E-07	0.56286	0.064641	0.024762	0.064641	8.7306E-08	0.0098911
328	317973	4030340	1.7953E-07	-2.8856E-08	1.50674E-07	0.150674	0.059073	0.016175	0.059073	4.5054E-08	0.0064426
329	318224	4030340	1.2496E-07	-1.2554E-07	-5.8E-10	-0.00058	0.041508	0.013496	0.041508	2.9123E-08	0.0053627
330	318476	4030340	8.6764E-08	-1.7765E-07	-9.0886E-08	-0.090886	0.034192	0.011132	0.034192	1.8392E-08	0.004414
331	318727	4030340	6.3376E-08	-1.9716E-07	-1.33784E-07	-0.133784	0.036834	0.0093765	0.036834	1.2153E-08	0.0037092
332	318979	4030340	7.6438E-08	-1.6249E-07	-8.6052E-08	-0.086052	0.038569	0.0094192	0.038569	1.6468E-08	0.0037305
333	313947	4030498	-6.0714E-06	-0.000023152	-2.92234E-05	-29.2234	0	0	0	-0.000002018	0
334	314199	4030498	-7.3237E-06	-0.00002811	-3.54337E-05	-35.4337	0	0	0	-2.4367E-06	0
335	314450	4030498	-7.4194E-06	-0.000028833	-3.62524E-05	-36.2524	0	0	0	-2.4731E-06	0
336	314702	4030498	-5.7611E-06	-0.000023092	-2.88531E-05	-28.8531	0.000033012	0	0.000033012	-1.9266E-06	0
337	314954	4030498	-3.3633E-06	-0.000014753	-1.81163E-05	-18.1163	0.0014098	0	0.0014098	-1.1377E-06	0
338	315205	4030498	-1.5303E-06	-8.3233E-06	-9.8536E-06	-9.8536	0.00001649	0.0025496	0.00001649	-5.3632E-07	0.0008833
339	315457	4030498	3.3714E-07	-2.5236E-06	-2.18646E-06	-2.18646	0.00013329	0.074663	0.00013329	3.6647E-08	0.029569
340	315708	4030498	1.3227E-06	6.7729E-07	1.99999E-06	1.99999	0.012612	0.11138	0.012612	3.4036E-07	0.044328
341	315960	4030498	1.3504E-06	1.3189E-06	2.6693E-06	2.6693	0.015224	0.10423	0.015224	3.5827E-07	0.041535
342	316212	4030498	9.8106E-07	1.0034E-06	1.98446E-06	1.98446	0.0032796	0.075773	0.0032796	2.6124E-07	0.030246
343	316463	4030498	8.9872E-07	1.1419E-06	2.04062E-06	2.04062	0.034834	0.063351	0.034834	2.458E-07	0.025347
344	316715	4030498	8.6077E-07	1.1165E-06	1.97727E-06	1.97727	0.037964	0.060998	0.037964	2.3468E-07	0.024356
345	316966	4030498	7.6322E-07	1.0231E-06	1.78632E-06	1.78632	0.040964	0.053114	0.040964	2.0896E-07	0.021219
346	317218	4030498	6.3814E-07	8.5534E-07	1.49348E-06	1.49348	0.037897	0.04318	0.037897	1.7577E-07	0.017262
347	317469	4030498	4.5905E-07	5.2804E-07	9.8709E-07	0.98709	0.02747	0.031936	0.02747	1.2536E-07	0.012764
348	317721	4030498	2.8599E-07	2.2244E-07	5.0843E-07	0.50843	0.053692	0.020974	0.053692	7.6808E-08	0.0083813
349	317973	4030498	8.1278E-08	-1.0727E-07	-2.5992E-08	-0.025992	0.011046	0.0086917	0.011046	1.8885E-08	0.0034563
350	318224	4030498	1.3435E-07	-6.5557E-08	6.8793E-08	0.068793	0.040809	0.012926	0.040809	3.2847E-08	0.005146
351	318476	4030498	8.5148E-08	-1.3973E-07	-5.4582E-08	-0.054582	0.030723	0.010084	0.030723	1.8862E-08	0.0040039
352	318727	4030498	6.7073E-08	-1.5625E-07	-8.9177E-08	-0.089177	0.030325	0.0089216	0.030325	1.3856E-08	0.0035368
353	318979	4030498	5.2893E-08	-1.6358E-07	-1.10687E-07	-0.110687	0.031072	0.0078926	0.031072	1.007E-08	0.0031239
354	313947	4030656	-4.4504E-06	-0.000017542	-2.19924E-05	-21.9924	0	0	0	-1.4842E-06	0
355	314199	4030656	-4.7598E-06	-0.000018904	-2.36638E-05	-23.6638	0	0	0	-1.5903E-06	0
356	314450	4030656	-4.2246E-06	-0.000017129	-2.13536E-05	-21.3536	0.000028508	0	0.000028508	-1.4154E-06	0
357	314702	4030656	-2.8547E-06	-0.000012378	-1.52327E-05	-15.2327	0.0034315	0	0.0034315	-9.6298E-07	0
358	314954	4030656	-1.8437E-06	-8.8319E-06	-1.06756E-05	-10.6756	0.0020154	0	0.0020154	-6.3127E-07	0
359	315205	4030656	-7.3336E-07	-5.3324E-06	-6.06576E-06	-6.06576	0.010956	0.022737	0.010956	-2.8062E-07	0.0086612
360	315457	4030656	3.1332E-07	-0.000001971	-1.65768E-06	-1.65768	0.0079973	0.0629	0.0079973	4.1014E-08	0.024872
361	315708	4030656	1.0464E-06	3.7888E-07	1.42528E-06	1.42528	0.015338	0.08918	0.015338	2.6753E-07	0.035505
362	315960	4030656	9.2487E-07	8.383E-07	1.76317E-06	1.76317	0.022365	0.072235	0.022365	2.4483E-07	0.028811
363	316212	4030656	7.2306E-07	6.9629E-07	1.41935E-06	1.41935	0.018607	0.055143	0.018607	1.9314E-07	0.022007
364	316463	4030656	5.7638E-07	4.5287E-07	1.02925E-06	1.02925	0.029484	0.045445	0.029484	1.5237E-07	0.01813
365	316715	4030656	5.5213E-07	4.3644E-07	9.8857E-07	0.98857	0.032019	0.043744	0.032019	1.4545E-07	0.017446
366	316966	4030656	5.2922E-07	5.028E-07	1.03202E-06	1.03202	0.029567	0.040186	0.029567	1.4121E-07	0.016033
367	317218	4030656	4.6175E-07	4.9447E-07	9.5622E-07	0.95622	0.046109	0.033518	0.046109	1.2481E-07	0.013385
368	317469	4030656	2.6328E-07	2.1536E-07	4.7864E-07	0.47864	0.014394	0.019042	0.014394	7.0856E-08	0.0076035
369	317721	4030656	1.716E-07	6.5516E-08	2.37116E-07	0.237116	0.017556	0.013917	0.017556	4.4814E-08	0.0055563
370	317973	4030656	2.9289E-08	-1.3032E-07	-1.01031E-07	-0.101031	0.0050085	0.0045364	0.0050085	5.2906E-09	0.001799
371	318224	4030656	1.3707E-07	-2.1541E-08	1.15529E-07	0.115529	0.036592	0.012341	0.036592	3.4415E-08	0.0049186
372	318476	4030656	9.0909E-08	-1.0157E-07	-1.0661E-08	-0.010661	0.026701	0.0096452	0.026701	2.1246E-08	0.0038361
373	318727	4030656	6.0669E-08	-1.4585E-07	-8.5781E-08	-0.085781	0.024974	0.0078632	0.024974	1.2494E-08	0.0031198
374	318979	4030656	4.9248E-08	-1.5361E-07	-1.04362E-07	-0.104362	0.027886	0.0071833	0.027886	9.4932E-09	0.0028462
375	313947	4030815	-3.2287E-06	-0.000013116	-1.63447E-05	-16.3447	0	0	0	-0.000001081	0
376	314199	4030815	-3.1909E-06	-0.000013089	-1.62799E-05	-16.2799	0.000016651	0	0.000016651	-1.0707E-06	0
377	314450	4030815	-2.4527E-06	-0.000010562	-1.30147E-05	-13.0147	0.00080298	0	0.00080298	-8.2726E-07	0
378	314702	4030815	-0.000001569	-0.000007459	-0.000009028	-9.028	0.0069212	0	0.0069212	-5.3582E-07	0
379	314954	4030815	-1.0328E-06	-5.6706E-06	-6.7034E-06	-6.7034	0.012125	0.0018326	0.012125	-3.6154E-07	0.00063914
380	315205	4030815	-3.3499E-07	-3.6711E-06	-4.00609E-06	-4.00609	0.008669	0.030682	0.008669	-1.5016E-07	0.011922
381	315457	4030815	3.3506E-07	-1.5285E-06	-1.19344E-06	-1.19344	0.015018	0.056371	0.015018	5.5367E-08	0.022292
382	315708	4030815	7.1215E-07	9.6389E-09	7.21789E-07	0.7217889	0.027952	0.064708	0.027952	1.7784E-07	0.025759
383	315960	4030815	5.6555E-07	3.2893E-07	8.9448E-07	0.89448	0.016681	0.047198	0.016681	1.4662E-07	0.018825
384	316212	4030815	5.5705E-07	5.0504E-07	1.06209E-06	1.06209	0.027217	0.04207	0.027217	1.4907E-07	0.016791
385	316463	4030815	4.5243E-07	3.2871E-07	7.8114E-07	0.78114	0.030317	0.03643	0.030317	1.1882E-07	0.01452

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
386	316715	4030815	4.1707E-07	0.000000244	6.6107E-07	0.66107	0.029926	0.034543	0.029926	1.0826E-07	0.013756
387	316966	4030815	3.735E-07	1.7905E-07	5.5255E-07	0.55255	0.023723	0.031305	0.023723	9.6391E-08	0.01247
388	317218	4030815	3.3134E-07	1.9103E-07	5.2237E-07	0.52237	0.027703	0.026302	0.027703	8.6904E-08	0.010499
389	317469	4030815	1.6537E-07	6.689E-08	2.3226E-07	0.23226	0.010073	0.013074	0.010073	4.3301E-08	0.0052166
390	317721	4030815	9.2806E-08	-3.2237E-08	6.0569E-08	0.060569	0.0053705	0.0082817	0.0053705	2.3254E-08	0.0033
391	317973	4030815	3.4859E-08	-1.2188E-07	-8.7021E-08	-0.087021	0.0075979	0.0048154	0.0075979	6.9254E-09	0.0019116
392	318224	4030815	1.2896E-07	-2.0869E-08	1.08091E-07	0.108091	0.038368	0.011624	0.038368	3.2342E-08	0.0046279
393	318476	4030815	9.5947E-08	-7.3685E-08	2.2262E-08	0.022262	0.032978	0.0095553	0.032978	2.3059E-08	0.003803
394	318727	4030815	6.4745E-08	-1.1627E-07	-5.1525E-08	-0.051525	0.026686	0.0075713	0.026686	1.4367E-08	0.0030084
395	318979	4030815	4.5184E-08	-1.4012E-07	-9.4936E-08	-0.094936	0.017138	0.0063868	0.017138	8.8814E-09	0.0025328
396	314147	4029689	-4.6405E-06	-0.000017551	-2.21915E-05	-22.1915	0	0	0	-1.5369E-06	0
397	314961	4030517	-3.0564E-06	-0.000013606	-1.66624E-05	-16.6624	0.0024356	0	0.0024356	-0.000001036	0
398	315839	4030375	0.000001844	1.6286E-06	3.4726E-06	3.4726	0.014326	0.14419	0.014326	4.8632E-07	0.057418
399	316657	4030352	1.2783E-06	2.0436E-06	3.3219E-06	3.3219	0.046151	0.083005	0.046151	3.5682E-07	0.03323
400	317361	4030179	6.7089E-07	8.7374E-07	1.54463E-06	1.54463	0.047489	0.04476	0.047489	1.858E-07	0.017929
401	318513	4029741	6.2418E-08	-4.3766E-07	-3.75242E-07	-0.375242	0.067196	0.012679	0.067196	8.2521E-09	0.0050152
402	318199	4028391	7.9752E-07	7.8253E-07	1.58005E-06	1.58005	0.060887	0.057422	0.060887	2.1511E-07	0.022871
403	317302	4027693	1.2617E-07	-7.2059E-07	-5.9442E-07	-0.59442	0.049825	0.022158	0.049825	1.9627E-08	0.0087669
404	316265	4028364	-4.5526E-07	-2.8146E-06	-3.26986E-06	-3.26986	0.088111	0.0049479	0.088111	-1.6392E-07	0.0017853
405	316611	4028986	6.9285E-06	9.8865E-06	0.000016815	16.815	0.30794	0.43883	0.30794	1.9243E-06	0.17541
406	314180	4029952	-0.000011758	-0.000043516	-0.000055274	-55.274	0	0	0	-3.8855E-06	0
407	314516	4030398	-0.000010963	-0.00004171	-0.000052673	-52.673	0	0	0	-3.6454E-06	0
408	314946	4028025	-3.2376E-07	-1.4745E-06	-1.79826E-06	-1.79826	0.025635	0	0.025635	-1.0998E-07	0
409	317360	4029626	2.3837E-06	5.3979E-06	7.7816E-06	7.7816	0.19421	0.10528	0.19421	7.1863E-07	0.042813
410	314997	4030202	-0.000018247	-0.000069009	-0.000087256	-87.256	0	0	0	-6.0455E-06	0
411	314203	4030220	-0.000015016	-0.000055414	-0.00007043	-70.43	0	0	0	-4.9712E-06	0
412	314191	4030199	-0.000014872	-0.000054882	-0.000069754	-69.754	0	0	0	-4.9227E-06	0
413	314181	4030131	-0.00001449	-0.000053483	-0.000067973	-67.973	0	0	0	-4.7934E-06	0
414	314183	4030083	-0.000014011	-0.000051746	-0.000065757	-65.757	0	0	0	-4.6329E-06	0
415	314195	4030020	-0.000013791	-0.000050929	-0.00006472	-64.72	0	0	0	-4.5581E-06	0
416	314233	4029949	-0.000015178	-0.000055851	-0.000071029	-71.029	0	0	0	-5.0117E-06	0
417	314233	4029852	-0.000012983	-0.000047773	-0.000060756	-60.756	0	0	0	-4.2848E-06	0
418	314230	4029645	-5.8215E-06	-0.00002182	-2.76415E-05	-27.6415	0	0	0	-1.9256E-06	0
419	314307	4029548	-4.3787E-06	-0.00001669	-2.10687E-05	-21.0687	0	0	0	-1.4515E-06	0
420	314588	4029384	-5.9729E-06	-0.000022517	-2.84899E-05	-28.4899	0	0	0	-1.9768E-06	0
421	314832	4029237	-3.5614E-06	-0.000014066	-1.76274E-05	-17.6274	0.02605	0	0.02605	-1.1855E-06	0
422	314912	4029203	-3.2235E-06	-0.000012878	-1.61015E-05	-16.1015	0.038395	0	0.038395	-1.0747E-06	0
423	314995	4029207	-3.3196E-06	-0.000013336	-1.66556E-05	-16.6556	0.046846	0	0.046846	-1.1077E-06	0
424	315090	4029260	-3.8372E-06	-0.000015484	-1.93212E-05	-19.3212	0.057876	0	0.057876	-1.2819E-06	0
425	315383	4029404	-4.6433E-06	-0.000019457	-2.41003E-05	-24.1003	0.081823	0	0.081823	-1.5609E-06	0
426	315583	4029427	-2.8338E-06	-0.000014147	-1.69808E-05	-16.9808	0.093662	0	0.093662	-9.7565E-07	0
427	315713	4029427	-1.0038E-06	-9.3914E-06	-1.03952E-05	-10.3952	0.12546	0.06773	0.12546	-4.2373E-07	0.027157
428	315808	4029411	4.2236E-07	-5.6491E-06	-5.22674E-06	-5.22674	0.14085	0.14206	0.14085	-5.93E-09	0.056739
429	315997	4029323	3.1032E-06	1.1494E-06	4.2526E-06	4.2526	0.18122	0.28081	0.18122	7.7937E-07	0.11197
430	316417	4029123	5.4416E-06	7.4624E-06	0.000012904	12.904	0.39695	0.38171	0.39695	1.4817E-06	0.15262
431	316507	4029078	6.1742E-06	8.7898E-06	0.000014964	14.964	0.41395	0.41416	0.41395	1.6971E-06	0.16555
432	316587	4029063	0.000010215	0.000015464	0.000025679	25.679	0.40046	0.62813	0.40046	2.8559E-06	0.25123
433	316644	4029032	0.000012079	0.000018458	0.000030537	30.537	0.37067	0.7216	0.37067	3.3943E-06	0.28861
434	316721	4028973	0.000010336	0.000015641	0.000025977	25.977	0.31574	0.62081	0.31574	0.000002901	0.24812
435	316780	4028941	0.000009625	0.000014554	0.000024179	24.179	0.29025	0.57861	0.29025	0.000002701	0.23117
436	316846	4028943	0.000011103	0.000017113	0.000028216	28.216	0.30896	0.65729	0.30896	3.1253E-06	0.26259
437	316899	4028951	0.00001204	0.000018771	0.000030811	30.811	0.30232	0.70943	0.30232	3.3926E-06	0.28328
438	316940	4028969	0.00001263	0.000019894	0.000032524	32.524	0.2976	0.7445	0.2976	3.5594E-06	0.29712
439	317023	4029035	0.000013024	0.000021083	0.000034107	34.107	0.28057	0.77242	0.28057	0.00000367	0.30821
440	317116	4029113	0.000011395	0.000019376	0.000030771	30.771	0.24767	0.67781	0.24767	3.2167E-06	0.27111
441	317168	4029156	9.5084E-06	0.000016848	2.63564E-05	26.3564	0.23512	0.56808	0.23512	2.6881E-06	0.22752
442	317192	4029191	8.7296E-06	0.000016056	2.47856E-05	24.7856	0.22816	0.51823	0.22816	2.4755E-06	0.20784
443	317227	4029275	8.0569E-06	0.000016823	2.48799E-05	24.8799	0.23929	0.43949	0.23929	2.3333E-06	0.17749
444	317230	4029386	0.000008875	0.000024224	0.000033099	33.099	0.28535	0.33017	0.28535	2.7453E-06	0.13673
445	317225	4029603	5.8839E-06	0.00001726	2.31439E-05	23.1439	0.20524	0.15742	0.20524	0.000001886	0.065828
446	316912	4029594	0.000014363	0.000036337	0.0000507	50.7	0.36101	0.69707	0.36101	4.2815E-06	0.28343
447	316482	4029611	0.000028718	0.000058186	0.000086904	86.904	0.33009	1.985	0.33009	0.00000794	0.79159
448	316188	4029644	0.000022621	0.000044548	0.000067169	67.169	0.23685	1.6284	0.23685	6.2023E-06	0.64747
449	315845	4029662	7.8236E-06	0.000010192	1.80156E-05	18.0156	0.1444	0.66776	0.1444	2.0349E-06	0.2661
450	315405	4029682	-7.3603E-06	-0.000031376	-3.87363E-05	-38.7363	0.049692	0	0.049692	-2.4748E-06	0
451	315412	4030185	-1.0333E-06	-8.9078E-06	-9.9411E-06	-9.9411	0	0.057658	0	-4.2273E-07	0.022055
452	314948	4030203	-0.000021767	-0.000081525	-0.000103292	-103.292	0	0	0	-7.2115E-06	0
453	314898	4030204	-0.000024956	-0.000092861	-0.000117817	-117.817	0	0	0	-8.2695E-06	0
454	314848	4030205	-0.000027458	-0.00010171	-0.000129168	-129.168	0	0	0	-9.0994E-06	0
455	314799	4030207	-0.000029278	-0.00010811	-0.000137388	-137.388	0	0	0	-9.7031E-06	0
456	314749	4030208	-0.000030467	-0.00011222	-0.000142687	-142.687	0	0	0	-0.000010097	0
457	314699	4030209	-0.000031078	-0.00011425	-0.000145328	-145.328	0	0	0	-0.0000103	0
458	314650	4030210	-0.000031125	-0.00011426	-0.000145385	-145.385	0	0	0	-0.000010315	0
459	314600	4030211	-0.000030722	-0.00011265	-0.000143372	-143.372	0	0	0	-0.000010179	0
460	314550	4030212	-0.000029903	-0.00010956	-0.000139463	-139.463	0	0	0	-9.9059E-06	0
461	314501	4030213	-0.000028719	-0.00010517	-0.000133889	-133.889	0	0	0	-9.5116E-06	0
462	314451	4030215	-0.000027125	-0.000099319	-0.000126444	-126.444	0	0	0	-8.9813E-06	0

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
463	314401	4030216	-0.000025048	-0.000091746	-0.000116794	-116.794	0	0	0	-8.2913E-06	0
464	314352	4030217	-0.00002261	-0.000082892	-0.000105502	-105.502	0	0	0	-7.4829E-06	0
465	314302	4030218	-0.000020046	-0.000073603	-0.000093649	-93.649	0	0	0	-6.6341E-06	0
466	314252	4030219	-0.000017473	-0.000064297	-0.00008177	-81.77	0	0	0	-5.7834E-06	0
467	314186	4030165	-0.000014852	-0.000054798	-0.00006965	-69.65	0	0	0	-4.9145E-06	0
468	314189	4030052	-0.000013892	-0.000051309	-0.000065201	-65.201	0	0	0	-4.5924E-06	0
469	314214	4029984	-0.000014487	-0.000053408	-0.000067895	-67.895	0	0	0	-4.7861E-06	0
470	314233	4029900	-0.000014012	-0.000051563	-0.000065575	-65.575	0	0	0	-0.000004625	0
471	314233	4029811	-0.000011964	-0.000044039	-0.000056003	-56.003	0	0	0	-3.9479E-06	0
472	314232	4029769	-0.000010796	-0.000039783	-0.000050579	-50.579	0	0	0	-3.5625E-06	0
473	314231	4029728	-9.4662E-06	-0.000034959	-4.44252E-05	-44.4252	0	0	0	-3.1246E-06	0
474	314230	4029686	-7.8611E-06	-0.00002916	-3.70211E-05	-37.0211	0	0	0	-2.5964E-06	0
475	314255	4029613	-5.3366E-06	-0.000020091	-2.54276E-05	-25.4276	0	0	0	-1.7662E-06	0
476	314281	4029581	-4.8036E-06	-0.000018196	-2.29996E-05	-22.9996	0	0	0	-1.5911E-06	0
477	314347	4029525	-4.8836E-06	-0.000018524	-2.34076E-05	-23.4076	0	0	0	-1.6176E-06	0
478	314387	4029502	-5.3404E-06	-0.000020183	-2.55234E-05	-25.5234	0	0	0	-1.7679E-06	0
479	314427	4029478	-5.6878E-06	-0.000021447	-2.71348E-05	-27.1348	0	0	0	-1.8823E-06	0
480	314468	4029455	-5.9174E-06	-0.000022283	-2.82004E-05	-28.2004	0	0	0	-1.9579E-06	0
481	314508	4029431	-5.9797E-06	-0.000022519	-2.84987E-05	-28.4987	0	0	0	-1.9786E-06	0
482	314548	4029408	-6.0121E-06	-0.000022645	-2.86571E-05	-28.6571	0	0	0	-1.9894E-06	0
483	314629	4029360	-5.6479E-06	-0.000021368	-2.70159E-05	-27.0159	0	0	0	-1.8702E-06	0
484	314670	4029335	-5.1185E-06	-0.0000195	-2.46185E-05	-24.6185	0	0	0	-1.6965E-06	0
485	314710	4029311	-4.6405E-06	-0.000017827	-2.24675E-05	-22.4675	0	0	0	-1.5397E-06	0
486	314751	4029286	-4.2405E-06	-0.000016434	-2.06745E-05	-20.6745	0.0091953	0	0.0091953	-1.4085E-06	0
487	314791	4029262	-3.8779E-06	-0.000015172	-1.90499E-05	-19.0499	0.020698	0	0.020698	-1.2894E-06	0
488	314872	4029220	-3.3644E-06	-0.000013384	-1.67484E-05	-16.7484	0.034169	0	0.034169	-0.000001121	0
489	314953	4029205	-3.2779E-06	-0.000013128	-1.64059E-05	-16.4059	0.042627	0	0.042627	-1.0933E-06	0
490	315027	4029225	-3.4881E-06	-0.000014045	-1.75331E-05	-17.5331	0.051068	0	0.051068	-1.1644E-06	0
491	315058	4029242	-3.6538E-06	-0.000014737	-1.83908E-05	-18.3908	0.053913	0	0.053913	-1.2203E-06	0
492	315132	4029281	-4.0429E-06	-0.000016327	-2.03699E-05	-20.3699	0.055973	0	0.055973	-1.3512E-06	0
493	315174	4029301	-4.2347E-06	-0.00001712	-2.13547E-05	-21.3547	0.048953	0	0.048953	-0.000001416	0
494	315216	4029322	-4.4107E-06	-0.000017869	-2.22797E-05	-22.2797	0.061504	0	0.061504	-1.4756E-06	0
495	315258	4029342	-4.5629E-06	-0.000018558	-2.31209E-05	-23.1209	0.066493	0	0.066493	-1.5276E-06	0
496	315300	4029363	-4.6659E-06	-0.000019103	-2.37689E-05	-23.7689	0.071066	0	0.071066	-1.5637E-06	0
497	315341	4029383	-0.000004698	-0.000019423	-0.000024121	-24.121	0.073087	0	0.073087	-1.5764E-06	0
498	315423	4029408	-4.3664E-06	-0.000018651	-2.30174E-05	-23.0174	0.084786	0	0.084786	-1.4714E-06	0
499	315463	4029413	-4.0415E-06	-0.000017693	-2.17345E-05	-21.7345	0.090209	0	0.090209	-1.3664E-06	0
500	315503	4029418	-3.6759E-06	-0.000016613	-2.02889E-05	-20.2889	0.093515	0	0.093515	-1.2481E-06	0
501	315543	4029423	-3.2728E-06	-0.000015426	-1.86988E-05	-18.6988	0.095204	0	0.095204	-1.1176E-06	0
502	315626	4029427	-2.3016E-06	-0.000012618	-1.49196E-05	-14.9196	0.09963	0.0026202	0.09963	-8.0639E-07	0.0010649
503	315669	4029427	-1.6649E-06	-0.000011012	-1.26769E-05	-12.6769	0.10982	0.03379	0.10982	-6.1791E-07	0.013589
504	315760	4029419	-3.1678E-07	-7.5635E-06	-7.88028E-06	-7.88028	0.13323	0.10263	0.13323	-2.2157E-07	0.04104
505	315846	4029394	8.8628E-07	-4.3719E-06	-3.48562E-06	-3.48562	0.1378	0.16447	0.1378	1.3172E-07	0.065608
506	315883	4029376	1.3742E-06	-3.0805E-06	-1.7063E-06	-1.7063	0.15472	0.18892	0.15472	2.7553E-07	0.075317
507	315921	4029358	1.9087E-06	-1.7222E-06	1.865E-07	0.1865	0.16394	0.21679	0.16394	4.3198E-07	0.086413
508	315959	4029341	2.4855E-06	-3.1153E-07	2.17397E-06	2.17397	0.17272	0.24748	0.17272	6.0002E-07	0.098662
509	316039	4029303	3.7397E-06	2.6297E-06	6.3694E-06	6.3694	0.19087	0.31453	0.19087	9.645E-07	0.12546
510	316081	4029283	4.2493E-06	3.8423E-06	8.0916E-06	8.0916	0.20132	0.34084	0.20132	1.1134E-06	0.13598
511	316123	4029263	4.6001E-06	4.7467E-06	9.3468E-06	9.3468	0.21358	0.3582	0.21358	1.2168E-06	0.14293
512	316165	4029243	4.8389E-06	5.4257E-06	1.02646E-05	10.2646	0.22953	0.36898	0.22953	1.2884E-06	0.14728
513	316207	4029223	5.0343E-06	6.0029E-06	1.10372E-05	11.0372	0.24854	0.37698	0.24854	1.3477E-06	0.15054
514	316249	4029203	5.1506E-06	6.4002E-06	1.15508E-05	11.5508	0.27656	0.38063	0.27656	1.3841E-06	0.15203
515	316291	4029183	5.1986E-06	6.6573E-06	1.18559E-05	11.8559	0.30304	0.38074	0.30304	1.4006E-06	0.15205
516	316333	4029163	5.1859E-06	6.7984E-06	1.19843E-05	11.9843	0.33618	0.3771	0.33618	1.4001E-06	0.1506
517	316375	4029143	5.2663E-06	7.0692E-06	1.23355E-05	12.3355	0.36829	0.37705	0.36829	1.4273E-06	0.15065
518	316447	4029108	5.4674E-06	7.5737E-06	1.30411E-05	13.0411	0.42569	0.38028	0.42569	1.4916E-06	0.15206
519	316477	4029093	5.6281E-06	7.8859E-06	0.000013514	13.514	0.43664	0.38683	0.43664	1.5394E-06	0.15465
520	316547	4029070	7.9086E-06	0.000011681	1.95896E-05	19.5896	0.41056	0.50621	0.41056	2.1944E-06	0.2024
521	316615	4029047	0.00001137	0.000017312	0.000028682	28.682	0.38279	0.68657	0.38279	3.1892E-06	0.27463
522	316683	4029003	0.000011512	0.000017537	0.000029049	29.049	0.34345	0.68693	0.34345	3.2352E-06	0.27466
523	316751	4028957	9.9329E-06	0.000015018	2.49509E-05	24.9509	0.3006	0.59741	0.3006	2.7871E-06	0.23871
524	316813	4028942	0.000010485	0.000016031	0.000026516	26.516	0.27116	0.62419	0.27116	2.9479E-06	0.24939
525	316872	4028947	0.000011671	0.000018103	0.000029774	29.774	0.25739	0.68856	0.25739	3.2876E-06	0.27503
526	316967	4028991	0.000012977	0.000020629	0.000033606	33.606	0.29473	0.76645	0.29473	0.000003657	0.30579
527	316995	4029013	0.000013154	0.000021094	0.000034248	34.248	0.28852	0.77806	0.28852	3.7068E-06	0.31042
528	317054	4029061	0.000012571	0.00002062	0.000033191	33.191	0.26127	0.74817	0.26127	3.5422E-06	0.29868
529	317085	4029087	0.000012095	0.000020162	0.000032257	32.257	0.25487	0.71985	0.25487	3.4106E-06	0.28764
530	317142	4029135	0.00001049	0.00001819	0.00002868	28.68	0.24049	0.62528	0.24049	2.9634E-06	0.25026
531	317210	4029233	8.4028E-06	0.000016288	2.46908E-05	24.6908	0.23244	0.48511	0.23244	2.4009E-06	0.19508
532	317228	4029312	8.0195E-06	0.000018123	2.61425E-05	26.1425	0.26045	0.40718	0.26045	2.3588E-06	0.16531
533	317229	4029349	8.2027E-06	0.000020372	2.85747E-05	28.5747	0.27235	0.36838	0.27235	2.4677E-06	0.15081
534	317229	4029429	0.000010456	0.000031095	0.000041551	41.551	0.30552	0.29842	0.30552	0.000003332	0.12548
535	317228	4029473	0.000012584	0.000039526	0.00005211	52.11	0.27826	0.27516	0.27826	4.0994E-06	0.11759
536	317227	4029516	0.00001292	0.000041444	0.000054364	54.364	0.28882	0.24004	0.28882	4.2532E-06	0.10366
537	317226	4029559	8.9991E-06	0.000027892	3.68911E-05	36.8911	0.2638	0.19397	0.2638	2.9336E-06	0.082478
538	317180	4029601	9.1445E-06	0.000028879	3.80235E-05	38.0235	0.22996	0.183	0.22996	2.9973E-06	0.078324
539	317136	4029600	0.000019466	0.000066546	0.000086012	86.012	0.24526	0.2244	0.24526	0.000006557	0.10195

REC	X	Y	Year 1 Cancer Risk Sum	Year 2-23 Cancer Risk Sum	Project Cancer Sum	Project Cancer Risk Per Million Exposed	Acute Max Hazard Index	Chronic Max Hazard Index	Worker Acute Max Hazard Index	Worker Cancer Risk Sum	Worker Chronic Max Hazard Index
540	317091	4029599	0.000035902	0.00012667	0.000162572	162.572	0.24621	0.28391	0.24621	0.000012233	0.13689
541	317046	4029598	0.000038825	0.0001361	0.000174925	174.925	0.29122	0.34631	0.29122	0.000013187	0.16359
542	317001	4029596	0.000022655	0.000073859	0.000096514	96.514	0.31412	0.41522	0.31412	7.4689E-06	0.17953
543	316956	4029595	0.000015819	0.000045461	0.00006128	61.28	0.33573	0.53495	0.33573	4.9576E-06	0.22148
544	316864	4029596	0.000015386	0.000035593	0.000050979	50.979	0.33242	0.8916	0.33242	4.4367E-06	0.35942
545	316816	4029598	0.000017879	0.000039289	0.000057168	57.168	0.35745	1.1273	0.35745	5.0617E-06	0.45227
546	316769	4029600	0.00002013	0.000043155	0.000063285	63.285	0.34381	1.3226	0.34381	5.6448E-06	0.52926
547	316721	4029602	0.000022068	0.000046624	0.000068692	68.692	0.35492	1.4811	0.35492	6.1555E-06	0.59203
548	316673	4029604	0.00002368	0.000049594	0.000073274	73.274	0.35334	1.6092	0.35334	6.5836E-06	0.64316
549	316625	4029606	0.000024582	0.000051454	0.000076036	76.036	0.35308	1.6897	0.35308	6.8161E-06	0.67546
550	316578	4029608	0.000025496	0.000053157	0.000078653	78.653	0.35371	1.7656	0.35371	7.0561E-06	0.70571
551	316530	4029610	0.000026733	0.000055182	0.000081915	81.915	0.34155	1.8562	0.34155	7.3903E-06	0.74143
552	316433	4029617	0.000029993	0.000059566	0.000089559	89.559	0.34801	2.0545	0.34801	8.3014E-06	0.81841
553	316384	4029622	0.000029677	0.000058448	0.000088125	88.125	0.32987	2.033	0.32987	8.2125E-06	0.80955
554	316335	4029628	0.000027937	0.000055072	0.000083009	83.009	0.30627	1.9342	0.30627	7.7166E-06	0.76992
555	316286	4029633	0.000025961	0.000051303	0.000077264	77.264	0.28245	1.8229	0.28245	0.000007153	0.72527
556	316237	4029638	0.000024179	0.000047789	0.000071968	71.968	0.25936	1.7206	0.25936	6.6448E-06	0.6843
557	316139	4029646	0.000021624	0.000042371	0.000063995	63.995	0.22267	1.5722	0.22267	0.000005916	0.62507
558	316090	4029649	0.00002048	0.000039778	0.000060258	60.258	0.20797	1.5041	0.20797	0.00000559	0.59801
559	316041	4029652	0.00001889	0.000036129	0.000055019	55.019	0.19346	1.4041	0.19346	5.1402E-06	0.55827
560	315992	4029654	0.000016665	0.000030977	0.000047642	47.642	0.17714	1.2583	0.17714	4.5149E-06	0.50042
561	315943	4029657	0.000013974	0.000024705	0.000038679	38.679	0.16861	1.0793	0.16861	3.7598E-06	0.42941
562	315894	4029660	0.000010979	0.000017675	0.000028654	28.654	0.15635	0.87917	0.15635	0.00000292	0.34998
563	315796	4029664	5.2108E-06	3.8999E-06	9.1107E-06	9.1107	0.1359	0.49808	0.1359	1.2977E-06	0.1987
564	315747	4029667	3.0417E-06	-1.4644E-06	1.5773E-06	1.5773	0.12749	0.36209	0.12749	6.8137E-07	0.14465
565	315698	4029669	1.2087E-06	-6.1703E-06	-4.9616E-06	-4.9616	0.11774	0.25179	0.11774	1.5625E-07	0.1008
566	315649	4029671	-3.8483E-07	-0.000010449	-1.08338E-05	-10.83383	0.10673	0.16043	0.10673	-3.0463E-07	0.064495
567	315600	4029673	-1.8463E-06	-0.000014448	-1.62943E-05	-16.2943	0.094548	0.081204	0.094548	-7.3175E-07	0.033036
568	315551	4029676	-3.2554E-06	-0.000018231	-2.14864E-05	-21.4864	0.082601	0.0091313	0.082601	-1.1477E-06	0.0043873
569	315502	4029678	-4.5581E-06	-0.000022229	-2.67871E-05	-26.7871	0.0727	0	0.0727	-0.000001561	0
570	315453	4029680	-5.8974E-06	-0.000026553	-3.24504E-05	-32.4504	0.060088	0	0.060088	-1.9964E-06	0
571	315405	4029728	-7.8269E-06	-0.000033288	-4.11149E-05	-41.1149	0.032929	0	0.032929	-2.6286E-06	0
572	315406	4029774	-8.1717E-06	-0.00003482	-4.29917E-05	-42.9917	0.013856	0	0.013856	-2.7424E-06	0
573	315406	4029819	-8.2393E-06	-0.000035558	-4.37973E-05	-43.7973	0.00012663	0	0.00012663	-2.7668E-06	0
574	315407	4029865	-7.9333E-06	-0.000035179	-4.31123E-05	-43.1123	0	0	0	-2.6707E-06	0
575	315408	4029911	-0.000007321	-0.000033685	-0.000041006	-41.006	0	0	0	-2.4746E-06	0
576	315408	4029956	-6.4845E-06	-0.000030872	-3.73565E-05	-37.3565	0	0	0	-2.2027E-06	0
577	315409	4030002	-5.0544E-06	-0.000025149	-3.02034E-05	-30.2034	0	0	0	-1.7303E-06	0
578	315410	4030048	-3.4208E-06	-0.000018434	-2.18548E-05	-21.8548	0	0	0	-1.1873E-06	0
579	315410	4030093	-2.2408E-06	-0.000013757	-1.59978E-05	-15.9978	0	0.025674	0	-8.0912E-07	0.008881
580	315411	4030139	-1.5303E-06	-0.00001093	-1.24603E-05	-12.4603	0	0.045135	0	-5.8248E-07	0.01689
581	315366	4030187	-1.7691E-06	-0.00001131	-1.30791E-05	-13.0791	0	0.028215	0	-6.4834E-07	0.010205
582	315320	4030189	-0.000002675	-0.000014284	-0.000016959	-16.959	0	0	0	-9.2781E-07	0
583	315274	4030190	-3.6795E-06	-0.000017798	-2.14775E-05	-21.4775	0	0	0	-1.2563E-06	0
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588	315043	4030200	-0.000015018	-0.000057576	-0.000072594	-72.594	0	0	0	-0.000004981	0

APPENDIX F

HRA MODELING FILES

(available at https://bit.ly/3qmlbQJ)

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APPENDIX D

Biological Resources

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APPENDIX D-1

McKay Point Reservoir – Biological Resources Report
(Bumgardner Biological Consulting, 2013)

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Tulare Irrigation District
McKay Point Reservoir
Biological Resources Report,
Tulare, California



Prepared for:

Sespe Consulting, Inc.
468 Poli St., Suite 2E
Ventura, CA 93001

Prepared by:

Bumgardner Biological Consulting
11571 Prospect Hill Drive
Gold River, CA 95670

October 14, 2013

Tulare Irrigation District
McKay Point Reservoir Project Biological Resources Evaluation,
Tulare County, California

Introduction

This report summarizes the results of year 2011 and 2013 reconnaissance-level biological resources surveys conducted within and immediately adjacent to the site of the proposed McKay Point Reservoir (i.e., project site) in Tulare County, California (Figure 1). The project site lies 2.5 miles southwest of Lake Kaweah; 1.5 miles southeast of Bravo Lake; 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southwest of the community of Woodlake.

The Tulare Irrigation District (TID), Consolidated Peoples Ditch Company (CPDC) and Visalia & Kaweah Water Company (VKWC)) are joint owners of the approximately 200 acres of land adjacent to the Kaweah and St. Johns rivers that comprise the project site. This land is commonly referred to as the McKay's Point property.

The joint owners propose to construct a new reservoir (i.e., McKay's Point Reservoir) on the north side of the divergence of the Kaweah and St. Johns rivers near McKay's Point. The McKay's Point Reservoir will serve as a surface water storage/re-regulation facility (i.e., surface water management tool). The reservoir would occupy a surface area of approximately 180 acres and would have storage capacity of approximately 4,000 acre-feet. Depths of approximately 60 feet below ground surface (bgs) are proposed. Final slopes would be 3:1, horizontal:vertical (h:v), in order to minimize any bank erosion from the wind and water.

The project site and immediately adjacent lands within 250 feet of the site were evaluated during the biological resources survey to identify evidence of special-status plants and wildlife, rare or sensitive vegetation communities, and potential jurisdictional waters or wetlands that could be affected by the proposed project.

Survey Methods

The project site and adjacent lands were surveyed by Michael Bumgardner (Bumgardner Biological Consulting) on May 16, 2011 and September 18, 2013. The surveys were conducted on foot as random meander transects such that all portions of the project site could be effectively evaluated. Gross-scale mapping of the plant communities on the project site was conducted given that only three discernible communities occur on the site. A search for special-status plant and wildlife species was conducted and focused on local taxa that have been recorded in the California Natural Diversity Data Base (CNDDB) or California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants. Lastly, a reconnaissance-level search for waters with regulatory jurisdiction under the Clean Water Act, California Fish and Game Code, and/or Porter-Cologne Water Quality Control Act was conducted within the site boundaries.

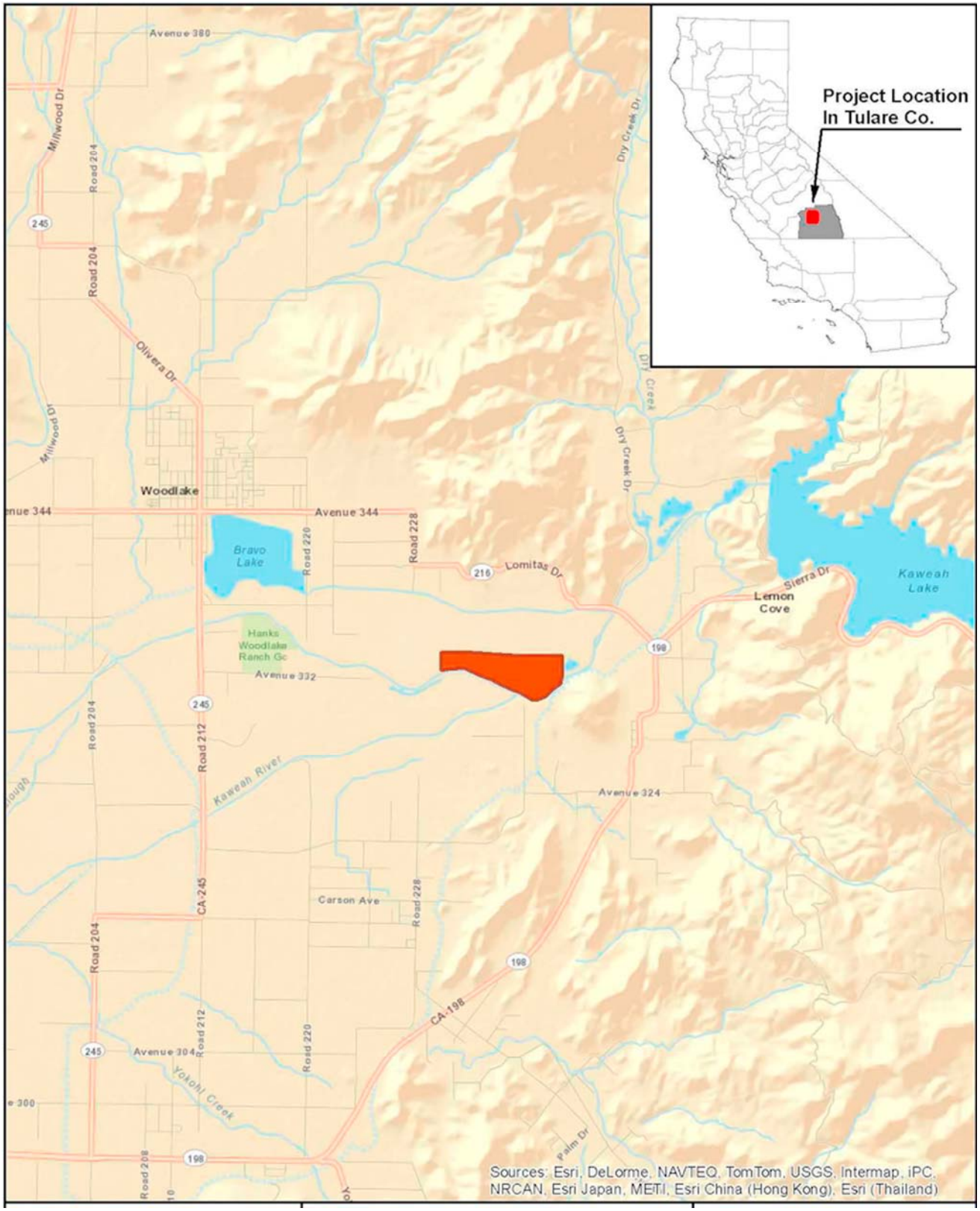


Figure 1
McKay Point Reservoir Project Site – Tulare County, California

Analytical Methods

A standard nine-quadrangle CNDDB/Rarefind 3 report was generated for the project site (i.e., query of the USGS 7.5-minute topographic quadrangle in which the project site is found as well as the immediate eight surrounding topographic quadrangles, viz. Woodlake and the surrounding Stokes Mtn., Ivanhoe, Exeter, Aukland, Rocky Hill, Shadequarter Mtn., Kaweah, and Chickencoop Canyon quads. The California Natural Diversity Data Base (CNDDB) contains records for special-status species, as well as sensitive natural communities, which have been reported to the California Department of Fish and Wildlife (CDFW). The Rarefind 3 report for the project site is provided in Appendix A. Each of the species identified in the Rarefind 3 report were then evaluated in terms of their likelihood of occurrence within and immediately adjacent to the project site. This evaluation considered the known distribution and habitat requirements of the species such that one of the following findings was prepared:

- Known to Occur – species was observed within or immediately adjacent to the project site during the May 16, 2011 survey or September 18, 2013 survey or has previously been documented within or immediately adjacent to the project site.
- High Potential – species has not been documented within or immediately adjacent to the project site, but should be expected on more than 50% of visits to suitable habitat in the project site during the appropriate season and time of day.
- Moderate Potential – species has not been documented within or immediately adjacent to the project site, but should be expected on less than 50% of visits to suitable habitat in the project site during the appropriate season and time of day.
- Low Potential – species has not been documented within or immediately adjacent to the project site nor is it likely to occur on the project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
- No Potential – species does not occur within the project site due to the lack of required habitat features for the species or the known range of the species is well defined and does not include the project site.

The findings for each of the species identified in the Rarefind 3 report are presented in this report.

Other sources of information on special-status species in California were subsequently reviewed given that the CNDDB is not inclusive of all special-status species that may occur in an area. A review of the CDFW's List of Special Animals (January 2011) and List of Special Plants (July 2013) was therefore conducted to determine if any special-status species not identified in the Rarefind 3 report have the potential to occur in the project site. This review was based on the professional experience of Michael Bumgardner within the region and elsewhere in California, but also included review of

other published sources of information on special-status species in California. These latter sources include the following:

- California Native Plant Society Inventory of Rare and Endangered Plants (online edition) (CNPS 2013).
- The Jepson Manual: Vascular Plants of California, 2nd edition (Baldwin and Goldman 2012).
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994).
- The Distribution of the Birds of California (Grinnell and Miller 1944).
- California Birds: Their Status and Distribution (Small 1994).
- California's Wildlife Volume II Birds (Zeiner et al. 1990).
- eBird Data Base (http://ebird.org/ebird/eBirdReports?cmd=Start) (2013).
- Mammalian Species of Special Concern in California (Williams 1986).
- Mammals of the Pacific States: California, Oregon, and Washington (Ingles 1978).
- Bat species accounts prepared as course materials for *Ecology and Conservation of California Bats* offered through San Francisco State University's Sierra Nevada Field Campus.
- Western Bat Working Group website (http://www.wbwg.org/species_accounts).

Species that are known or expected to occur in the vicinity of the project site were then further evaluated in this report.

Vegetation Communities and Site Characteristics

The project site is located immediately north of the divergence of the Kaweah and St. Johns rivers. The site is flat and has been used most recently to support cattle grazing. There are no developed uses on the site. Much of the onsite vegetation consists of non-native annual grassland (Figure 2). As such, most of the vegetation consists of non-native annual grasses [e.g., wild oat (*Avena fatua*)], but also includes herbaceous species such as lamb's-quarters (*Chenopodium album*), wild cucumber (*Marah* sp.), and deer weed (*Acmispon glaber*). Small, scattered stands of mule fat (*Baccharis salicifolia*) also occur within the non-native annual grassland. However, these latter stands are not significant enough in size to warrant mapping as a discernible vegetation community.

Mixed oak-riparian woodland occurs in the southeastern portion of the project site (Figure 2). Woody species that are associated with this stand of vegetation include willows (*Salix* spp.), Fremont's cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), tamarisk (*Tamarix* sp.), tree tobacco (*Nicotiana glauca*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizeni*). California wild grape (*Vitis californica*) occurs as a liana growing into the canopy of the woody species. The canopy cover in this stand of vegetation varies between approximately 20 and 100 percent and is best described as interrupted woodland.

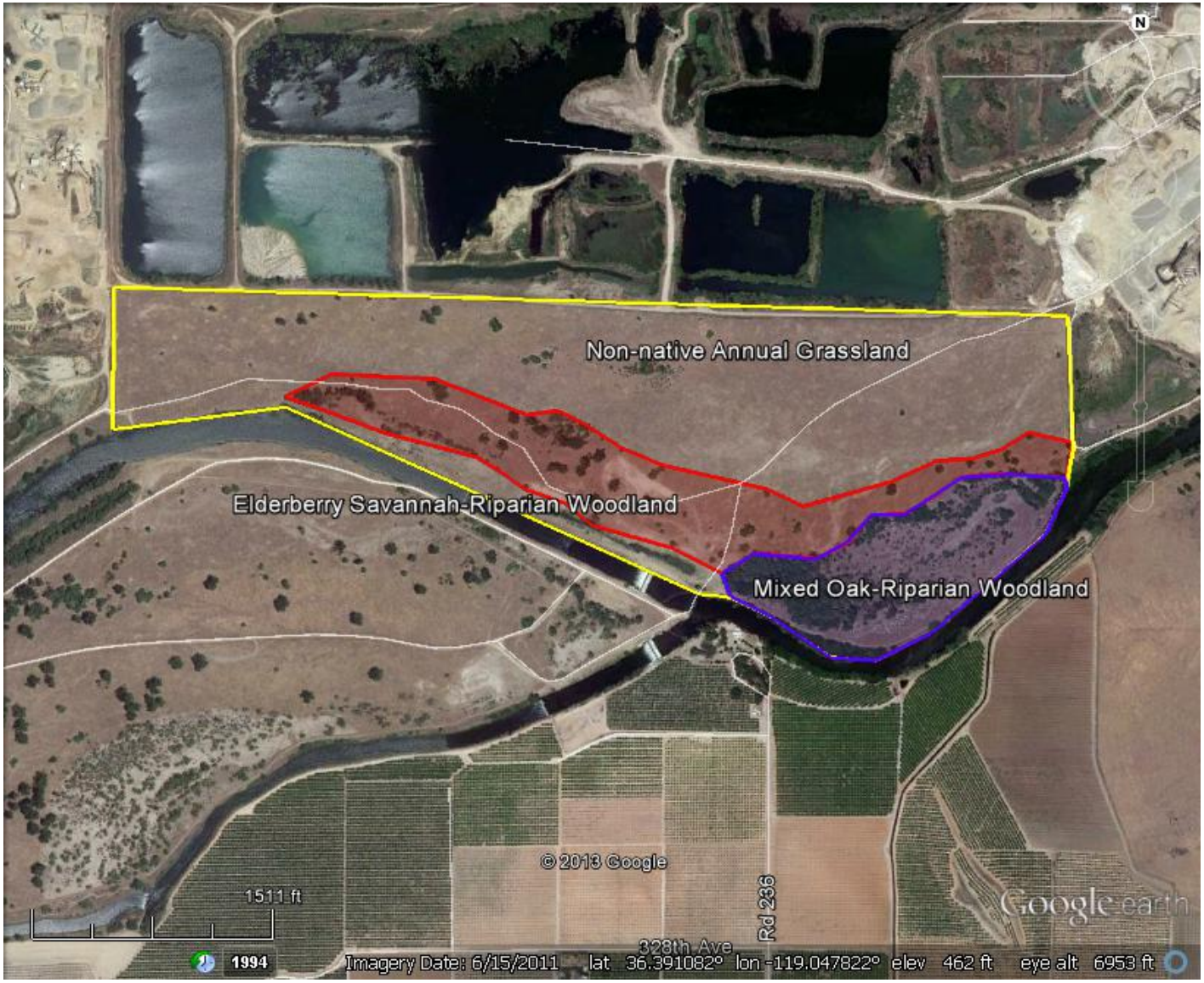


Figure 2
McKay Point Reservoir Project Site – Vegetation Communities

Approximately 39.8 acres of elderberry savannah-riparian woodland (a sensitive vegetation community tracked by the CDFW) occurs adjacent to the mixed oak-riparian woodland, but also extends west along the southern border of the project site (Figure 2). It should be noted that the depicted boundaries in Figure 2 are an approximation of the borders of this vegetation community and the mixed oak-riparian woodland as the two communities have no clearly discernible boundary where they occur adjacent to and grade into each other. The dominant species in the elderberry savannah-riparian woodland is blue elderberry. However, scattered Fremont's cottonwoods and willows also occur in this vegetation community. The onsite elderberry shrubs/clumps are large and old with many stems and likely represent the remnants of a formerly more contiguous community.

Jurisdictional Wetlands and Other Waters

Jurisdictional wetlands or other waters of the United States are areas that cannot be dredged or filled without a permit from the U.S. Environmental Protection Agency or U.S. Army Corps of Engineers (this latter permit is commonly referred to as a "Section 404" permit in reference to the section of the federal Clean Water Act that requires such permits). Actions that require issuance of a "Section 404" permit include earth-moving activities that result in fill of jurisdictional wetlands and other waters. It should be noted that such actions may also require the issuance of state permits (e.g., California Fish and Game Code Section 1603 streambed alteration agreement and/or Regional Water Quality Control Board Section (RWQCB) Section 401 clean water certification).

Wetlands or other waters of the United States are identified based on three criteria, viz. (1) soil characteristics, (2) hydrology, and (3) plant species. The U.S. Army Corps of Engineers (USACE) has developed a procedure and manual for delineating wetlands that requires comprehensive evaluation of these three criteria during field environmental assessments. A formal wetland delineation was not conducted for the purposes of this report. However, no waters that are subject to the jurisdiction of the USACE, CDFW, or RWQCB, other than the Kaweah and St. Johns rivers, occur on or immediately adjacent to the project site. The latter two rivers are jurisdictional waters and the placement of fill associated with the intake/outlet infrastructure of the McKay's Point Reservoir will be subject to the jurisdiction of the USACE, CDFW, and RWQCB.

Habitat Conservation Plans and Other Similar Habitat Management Plans

There are no Habitat Conservation Plans (HCPs), Natural Community Conservation Plans (NCCPs), or other approved local, regional, or state habitat conservation plans that apply to the project site.

Wildlife Diversity

The surveys within and adjacent to the project site resulted in the documentation of relatively low wildlife diversity (i.e., two species of amphibians, one species of reptile, 14 species of birds, and five species of mammals). However, it should be noted that no

comprehensive wildlife surveys were conducted for the project. The only amphibians that were found in and adjacent to the project site included Pacific treefrog (*Hyla regilla*) and bullfrog (*Rana catesbeiana = Lithobates catesbeianus*). Both of these species are relatively widespread in lower elevation drainages, ponds, and other waters in California. The only reptile species recorded within and adjacent to the project site was western fence lizard (*Sceloporus occidentalis*). This species is relatively widespread within the non-desert, lowland portions of California. The bird species recorded within and adjacent to the project site included phainopepla (*Phainopepla nitens*), northern mockingbird (*Mimus polyglottos*), Nuttall's woodpecker (*Picoides nuttallii*), American robin (*Turdus migratorius*), willow flycatcher (*Empidonax traillii*), Pacific-slope flycatcher (*E. difficilis*), house finch (*Haemorhous mexicanus*), western scrub-jay (*Aphelocoma californica*), Anna's hummingbird (*Calypte anna*), northern flicker (*Colaptes auratus*), turkey vulture (*Cathartes aura*), killdeer (*Charadrius vociferus*), black phoebe (*Sayornis nigricans*), and California quail (*Callipepla californica*). Most of these species are common and widespread year-round or winter residents within oak and riparian woodlands within the region. However, the willow flycatcher and Pacific-slope flycatcher are only migrants through the area and do not occur as a nesting or wintering species at the project site. Lastly, mammal species documented on and near the project site included California ground squirrel (*Otospermophilus beecheyi*) Botta's pocket gopher (*Thomomys bottae*) (mounds only), (burrows only), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and raccoon (*Procyon lotor*) (tracks only).

It should be noted that other wildlife species probably occur on or near the project site, but would not likely be found in one-day reconnaissance-level surveys. These other species include, but are not limited to, southern alligator lizard (*Elgaria multicarinata*), western skink (*Plestiodon skiltonianus*), common kingsnake (*Lampropeltis getula*), Pacific gopher snake (*Pituophis catenifer*), western rattlesnake (*Crotalus viridis*), several species of small mammals, several species of oak or riparian-associated passerines (i.e., songbirds), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*).

Special-Status Plant Species

No special-status plant taxa were observed on or immediately adjacent to the project site during the surveys. In addition, no special-status plant taxa that have been documented in the project region (Table 1) are considered to have any potential to occur on the project site given the onsite conditions (i.e., lack of suitable habitat for and/or known distribution of the species).

Special-Status Wildlife Species

Only two special-status wildlife species were observed on the project site during the surveys. One of these species (i.e., Nuttall's woodpecker) is a likely year-round resident in the mixed oak-riparian woodland in the southeastern portion of the project site. The second species (i.e., willow flycatcher) was only observed during the September 18, 2013 survey and is considered a migrant that passes through the area (including the project

site). Furthermore, this latter species is only considered a special-status species when nesting (typically in dense willow scrub in the Sierra Nevada).

Sixteen special-status wildlife species that have been documented in the project region (Table 1) are considered to have some potential to occur on or near the project site. Three of these species are insects (i.e., moestan blister beetle, Morrison's blister beetle, and Tulare cuckoo wasp) that are not well known in terms of their life history and behavior, but that have been recorded in the project vicinity in habitats similar to those that occur on the project site. As such, they cannot be discounted and are considered to have some potential, albeit low, to occur on the project site. There is also suitable habitat on the project site for a fourth special-status insect species [i.e., valley elderberry longhorn beetle (VELB)]. However, the nearest known occurrences of the beetle, which occurs in and on elderberry, are more than 4.5 miles southwest and 8.5 miles northeast of the project site. Furthermore, the beetle is known to have poor dispersal abilities and does not occur in large sections of elderberry savannah or riparian habitat that is otherwise suitable for the species other than it is isolated by reaches of unsuitable habitat (i.e., gaps in the suitable habitat as small as 300 linear feet). Though no exit holes attributable to VELB were found during the reconnaissance-level surveys of the project site, it should be noted that focused surveys for VELB exit holes would need to be conducted to support a finding of absence. Consequently, the taxon is considered to have some potential, albeit low, to occur on the project site.

Only one special-status reptile is believed to have any potential to occur on the project site. This latter species [i.e., western pond turtle (*Emys marmorata*)] is known from occurrences upstream in the Kaweah River drainage. In addition, it has been known to occur in a wide variety of slow-moving waters throughout California. Thus, it is considered to have some potential, albeit low, to occur in the aquatic habitats of the adjacent Kaweah and St. Johns rivers and to nest in the upland portions of the project site.

Ten special-status birds are considered to have some potential to occur on the project site. Seven of these latter species [Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), oak titmouse (*Baeolophus inornatus*), yellow-breasted chat (*Icteria virens*), lark sparrow (*Chondestes grammacus*), and Lawrence's goldfinch (*Spinus lawrencei*)] are known to nest in oak or riparian woodlands. Furthermore, each of these species has been recorded nesting within less than two miles of the project site. As such, each of these species, with the exception of oak titmouse is considered to have some potential, albeit low, to nest in the onsite mixed oak-riparian woodland. Given the presence of Nuttall's woodpecker in the mixed oak-riparian woodland, oak titmouse is considered to have a moderate potential to nest onsite since the species is a secondary cavity nester (i.e., nests in cavities/holes created by woodpeckers).

Other special-status bird species with some potential to occur on the project site include ferruginous hawk (*Buteo regalis*), merlin (*Falco columbarius*), and burrowing owl (*Athene cunicularia*). No evidence of burrowing owl was found on the project. In addition, no suitable burrows or burrow surrogates that could be used by the species were

found on the project site. However, California ground squirrel burrows were observed immediately offsite on the northern and eastern boundaries of the project site. As such, there is the potential for indirect impacts to the species at these off-site locations should they be occupied by the species. Ferruginous hawk and merlin do not occur in the project region as nesting species. However, they do occur in the area as wintering species and are considered special-status species when wintering. Given the presence of suitable habitat onsite (i.e., large tract of non-native grassland) and known winter occurrences within less than two miles, these two species are considered to have some potential, albeit low, to occur on the project site.

Only one special-status mammal is believed to have any potential to occur on the project site. Western red bat (*Lasiurus blossevillii*) is known to utilize large trees in riparian forest or orchards as roost sites. Therefore, the species is considered to have some potential, albeit low, to occur in the mixed oak-riparian woodland located on the project site.

Conclusions

Sensitive or special-status biological resources that could be adversely affected by the proposed McKay's Point Reservoir Project are limited to the following:

- elderberry savannah-riparian woodland (a sensitive vegetation community);
- Kaweah and St. Johns rivers (jurisdictional waters of the state and United States); and
- special-status wildlife species (up to 16 species).

Elderberry savannah is a sensitive vegetation community that is tracked by the CDFW. It is poorly represented in the CNDDB, but is known to occur throughout the Central Valley in small stands. Approximately 39.8 acres of this vegetation community would be adversely affected by the project.

Fill within the Kaweah and St. Johns rivers would occur with construction of each river's inflow and outflow channels and associated rip-rap or concrete aprons. This fill would require permitting from the USACE, CDFW, and RWQCB.

Adverse effects to up to 16 special-status wildlife species could occur with construction and operation of the project. Approximately half of these species are birds that may nest in the mixed oak-riparian woodland in the southeastern portion of the project site. The project would not result in direct effects to these species (i.e., loss of habitat), but could result in indirect effects (e.g., significant disturbance during nesting from nearby construction activities). The project could result in direct effects to burrowing owl even with no suitable roost sites on the project site since the loss of suitable foraging habitat could adversely affect individuals occupying adjacent lands. The project could also result in indirect effects to burrowing owls occupying adjacent offsite lands due to disturbance from nearby construction activities. The loss of foraging habitat for wintering merlin and ferruginous hawk would contribute to the cumulative loss of

suitable winter foraging habitat for these species. The remaining special-status species addressed by this report (i.e., insects and western pond turtle) could each experience adverse direct effects from loss of habitat. Furthermore, potential direct effects to western pond turtle could include loss of individuals (adults and eggs) during construction-related activities.

No other important, significant, sensitive, or regulated biological resources (including aquatic habitats, roost sites, staging areas, etc.) were found to be associated with the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
		PLANTS		
Atriplex cordulata var. *erecticaulis*	Earlimart orache	none/none/CNPS list 1B.2	This annual saltbush occurs on saline or alkaline soils in valley and foothill grassland. It is known from Kings, Kern, and Tulare counties. It blooms from August to November.	**No Potential.** No individuals of this taxon were observed within or near the project site. In addition, the taxon only occurs on saline or alkaline soils in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the taxon has no potential to occur within the project site.
Atriplex minuscula	lesser saltscale	none/none/CNPS list 1B.1	This annual saltbush grows in sandy alkaline areas in chenopod scrub, playas, and valley and foothill grassland. It is known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties. It blooms from May to October.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on sandy alkaline soils in chenopod scrub, playas, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Atriplex persistens	vernal pool smallscale	none/none/CNPS list 1B.2	This annual saltbush occurs in claypan and alkaline vernal pools and alkaline grasslands. It has been recorded from	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			Colusa, Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties. It blooms from June to October.	occurs in claypan and alkaline vernal pools and alkaline grasslands – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Brodiaea insignis	Kaweah brodiaea	none/SE/CNPS list 1B.2	This perennial bulbiferous herb occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland. It is known only from the Tule and Kaweah river drainages in Tulare County. It blooms from April to June.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Chamaesyce hooveri	Hoover's spurge	FE/none/CNPS list 1B.2	This species occurs in vernal pools in valley and foothill grassland (mostly in the northern Sacramento Valley), but has been found in Butte, Glenn, Colusa, Merced, Stanislaus, Tehama, and Tulare counties. It blooms from July to October.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs vernal pools in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Delphinium recurvatum	recurved larkspur	none/none/CNPS list 1B.2	This perennial herb occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland. It is known from Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, Sutter, and Tulare counties. It blooms from March to June.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Eriogonum nudum var. *murinum*	mouse buckwheat	none/none/CNPS list 1B.2	This perennial herb occurs on sandy soils in chaparral, cismontane woodland, and valley and foothill grassland. It known from only 11 occurrences – all in Tulare County. It blooms from June to November.	**No Potential.** No individuals of this taxon were observed within or near the project site. The taxon occurs on sandy soils in valley and foothill grassland – conditions that exist within the project site. However, all known records are from the Three Rivers area well upstream in the Kaweah River drainage. Therefore, the taxon is considered to have no potential to occur within the project site.
Eryngium spinosepalum	spiny-sepaled button-celery	none/none/CNPS list 1B.2	This perennial species occurs in wet valley and foothill grassland and vernal pools. Known occurrences have been	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			documented in the San Joaquin Valley (Kern to Stanislaus counties), along the Central Coast (Monterey and San Luis Obispo counties). Blooming occurs from April to May.	occurs in alkaline areas in wet valley and foothill grassland and vernal pools – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Fritillaria striata	striped adobe-lily	none/SE/CNPS list 1B.1	This perennial bulbiferous herb occurs in cismontane woodland and valley and foothill grassland (usually on clay soils). It is known from Kern and Tulare counties. It blooms from February to April.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and valley and foothill grassland (usually on clay soils) – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Glyceria grandis	American manna grass	none/none/CNPS list 2.3	This perennial rhizomatous grass occurs in bogs and fens, meadows and seeps, and marshes and swamps (stream banks and lake margins). It is known from El Dorado, Fresno, Humboldt, Mendocino, Mono, Placer, and Tulare counties. It blooms from June to August.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in bogs and fens, meadows and seeps, and marshes and swamps – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Leptosiphon serrulatus	Madera leptosiphon	none/none/CNPS list 1B.2	This annual herb occurs in cismontane woodland and lower montane coniferous forest. It is known from Fresno, Kern, Madera, Mariposa, and Tulare counties. It blooms from April to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and lower montane coniferous forest – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Mimulus norrisii	Kaweah monkeyflower	none/none/CNPS list 1B.3	This annual herb occurs on carbonate or rocky soils in chaparral and cismontane woodland. It has been found in Fresno and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and chaparral – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Mimulus pictus	calico monkeyflower	none/none/CNPS list 1B.2	This annual herb occurs on granitic soils (often in disturbed areas) in broadleafed upland forest and cismontane woodland. It has been found in Kern and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in broadleafed upland forest – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Orcuttia inaequalis	San Joaquin Valley orcutt grass	FT/SE/CNPS list 1B.1	This grass occurs in vernal pools (typically larger or more persistent pools) within valley and foothill grassland. The remaining populations of this species occur mostly in the southeastern San Joaquin Valley (Fresno, Merced, Madera, and Tulare counties). Historically, the species also occurred in Stanislaus County. It blooms from April to September.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in vernal pools in valley and foothill grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Pseudobahia bahiifolia	Hartweg's golden sunburst	FE/SE/CNPS list 1B.1	This species occurs in cismontane woodland and valley and foothill grassland (almost always on shallow, well-drained, fine-textured soils - typically on clay, acidic soils) on the north or northeast facing side of Mima mounds). It has been recorded in Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties. Blooming occurs from March to April.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in cismontane woodland and valley and foothill grassland on the north or northeast facing side of Mima mounds – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Tuctoria greenei	Greene's tuctoria	FE/SR/CNPS list 1B.1	This grass occurs in the dry bottoms of vernal pools in valley and foothill grassland. It is currently known to occur in Butte, Colusa, Glenn, Merced,	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs in vernal pools in valley and foothill

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
			Modoc, Shasta, and Tehama counties. Historically, it also occurred in Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties. It blooms from May to September.	grassland – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
INVERTEBRATES				
Branchinecta lynchi	Vernal pool fairy shrimp	FT/none/none	This species occurs primarily in vernal pools (sandstone depression, grass swale, earth slump, or basalt-flow depression pools) in grassland and oak savannah of the Central Valley. However, the species also occurs at a small number of locations in the central Coast Ranges from Monterey County to Santa Barbara County as well as Riverside County.	**No Potential.** There is no suitable vernal habitat within or adjacent (i.e., within 250 feet) to the project site for this species. Therefore, there is no potential for the species to be affected by the project.
Lepidurus packardi	Vernal pool tadpole shrimp	FE/none/none	This species inhabits clear to turbid vernal pools and swales in the Sacramento Valley and northern San Joaquin Valley.	**No Potential.** There is no suitable vernal habitat within or adjacent (i.e., within 250 feet) to the project site for this species. Therefore, there is no potential for the species to occur on the project site or be affected by the project.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Talanites moodyae	Moody's gnaphosid spider	none/SA/none	Little is known and published about this species. However, it has been found in grasslands under rocks (generally serpentine) on rocky mounts, buttes, and hilltops. Only six known occurrences are reported – all from Fresno and Tulare counties.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species only occurs on rocky mounts, buttes, or hilltops (usually under serpentine rocks) – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Lytta moesta	moestan blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in Fresno, Kern, Madera, Santa Cruz, Stanislaus, and Tulare counties. The CDFW reports that very little is known about the life history and behavior of this species. However, it has been collected from March to September and has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Therefore, it is considered to have some potential, albeit low, to occur on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lytta morrisoni	Morrison's blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Therefore, it is considered to have some potential, albeit low, to occur on the project site.
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/none/none	This subspecies occurs at scattered locations in the Central Valley and adjacent foothills of the Sierra Nevada and Coast Ranges. It is entirely dependent upon its host plant (i.e., elderberry spp.) and is only found where this shrub occurs (typically in riparian vegetation associations, but occasionally in single, isolated shrubs or stands of the plant).	**Low Potential.** A large number of old-growth elderryberry shrubs occur within the project site. Though no evidence of valley elderberry longhorn beetle exit holes was found during a reconnaissance-level survey of the project site, the subspecies cannot be discounted as occurring on the project site without more thorough surveys. Therefore, it is considered to have some potential, albeit low, to occur on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Chrysis tularensis	Tulare cuckoo wasp	none/SA/none	This species is known only from a small series of specimens that have been collected in Amador, Fresno, Monterey, and Tulare counties. Cuckoo wasps are nest parasitoids of predatory wasps and sawflies. However, the host species of this species are unknown. Adults have been found from April to June in open, sunny habitats with abundant flowers and small shrubs, where they feed on nectar.	**Low Potential.** Given that predatory wasps and sawflies (i.e., wasp's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as occurring on the project site. Furthermore, the nearest known record to the project site is from immediately north of the intersection of Road 212 and Avenue 344 (less than three miles from the project site). Therefore, it is considered to have some potential, albeit low, to occur on the project site.
AMPHIBIANS				
Ambystoma californiense	California tiger salamander	FT/ST/none	This species is found in annual grassland, oak savannah, and coastal sage scrub adjacent to vernal pools, stock ponds, and ponded reaches of ephemeral streams (aquatic breeding sites). The species is patchily distributed in the Central Valley from Yolo County to Kings County, but also occurs in Alameda and Contra Costa counties south through the interior	**No Potential.** No suitable aquatic breeding habitat for the species occurs within or immediately adjacent to the project site. Furthermore, the nearest known occurrences of the species (at and near the Stone Corral Ecological Reserve east of Yettem) are more than 11 miles west of the project site. Lastly, the onsite soils are very sandy and appear to preclude the creation of burrows by all species other than valley

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			valleys of the Coast Ranges. Disjunct populations occur in Santa Barbara County and Sonoma County.	pocket gopher. Therefore, there are only marginal underground refugia for the species onsite and it is considered to have no potential to occur on the project site.
Batrachoseps regius	Kings River slender salamander	none/SA/none	This species has been found in Fresno County on the south and east sides of the North Fork of the Kings River and at Summit Meadow in the drainage of the South Fork of the Kings River. It has also been found in the drainage of the middle fork of the Kaweah River in Tulare County. It occurs in talus, under rocks and downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest above 1,100 and 8,100 feet in elevation.	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species has only been recorded in talus, under rocks, under downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest between 1,100 and 8,100 feet – conditions that do not exist within the project site. Therefore, the species has no potential to occur within the project site.
Rana boylii	foothill yellow-legged frog	none/CSC/none	This species was historically distributed throughout the foothill portions of the Sierra Nevada and Coast Ranges drainages from the Oregon border to the San Gabriel River (Los Angeles County). The species requires shallow, small to moderate streams (typically perennial waters	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the species requires shallow, small to moderate streams (typically perennial waters with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs – conditions that do not exist

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			with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs).	within the project site. Therefore, the species has no potential to occur within the project site.
Lithobates pipiens	northern leopard frog (native populations only)	none/CSC/none	Historical populations of this species in California existed in scattered locations below 6,500 feet in Siskiyou and Modoc counties and in the northern Owens Valley. Individuals of unknown origin were introduced into El Dorado, Kern, Los Angeles, Merced, San Francisco, Sierra, Tehama, and Tulare counties between 1905 and 1970. Several of these introduced populations experienced rapid growth and range expansions before completely disappearing. Except for a small population that is currently present in Merced County, all of these introduced populations have perished. It has been found in grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, reservoirs (generally where there is permanent water with abundant aquatic vegetation).	**No Potential.** No individuals of this species were observed within or near the project site. In addition, the population recorded near Orosi in Tulare County is considered to be an introduced population and is therefore not a special-status species. Therefore, native populations of this species have no potential to occur within the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Spea hammondii	Western spadefoot	none/CSC/none	This species is found in dry habitats (e.g., annual grassland, oak savannah and woodland, and coastal sage scrub) adjacent to vernal pools, stock ponds, and overflow channels of low-gradient drainages within the Central Valley and coastal California from Monterey County to San Diego County.	**No Potential.** No suitable aquatic breeding habitat for the species occurs within or immediately adjacent to the project site. Furthermore, the project site is relatively landlocked by semi-perennial rivers, sand and gravel mining operations, and agricultural uses that would preclude movement of the species onto the site from more suitable habitats located near the site (e.g., lands north of Highway 216). Consequently, the species is considered to have no potential to occur within the project site.
REPTILES				
Emys marmorata	Western pond turtle	none/CSC/none	This species historically occurred throughout most of the Pacific-slope drainages in California (below approximately 4,000 feet). The species now occurs at scattered locations throughout its former range (primarily in the central Sierra Nevada foothills, Central Valley, San Francisco Bay area, and north-central coast and Coast Ranges. It occurs in and adjacent to	**Low Potential.** Given that potentially suitable habitat is provided by the adjacent Kaweah and St. Johns rivers and the species has been recorded upstream in the Kaweah River, it cannot be discounted as occurring on the project site. Suitable aquatic habitat within the project site only occurs in the Kaweah and St. Johns rivers. However, individuals could also enter the upland portion of the site for egg-laying.

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			ponds, reservoirs, or other slow-moving perennial aquatic habitats (e.g., sloughs, streams, and rivers). The species may be active year-round in some parts of its range.	Therefore, it is considered to have some potential, albeit low, to occur on the project site.
BIRDS				
Ardea herodias	great blue heron (nesting colony)	none/SA/none	This species is fairly common throughout most of California where there are shallow estuaries, or freshwater or saltwater emergent wetlands. However, it is less common along riverine and rocky coastal shores and above the foothills in the mountains. Rookeries (i.e., nesting colonies) are typically active from February to late July and occur in the tops of secluded large snags or live trees. Rookeries are sometime shared with the great egret or other large wading birds.	**No Potential.** No nesting colonies of this species were observed within or near the project site. In addition, the nearest reported nesting colony is on Dry Creek, one mile north of the confluence of Dry Creek and the Kaweah River (more than two miles from the project site). Therefore, no nesting colonies of this species occur within or immediately adjacent to the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Gymnogyps californianus	California condor	FE/SE/none	This species occurs as a reintroduced species primarily in the mountains of Ventura, Santa Barbara, Los Angeles, Monterey, and San Benito counties. However, individuals are known to be wide-ranging and occasionally occur soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may also be used.	**No Potential.** No suitable roost sites for this species occur within or near the project site. In addition, other potential attractors to the project site (e.g., large mammals and potential food sources) are not provided at or near the site. Lastly, the nearest known use areas for this species are located in more rugged country more than 13 miles southeast of the project site. Therefore, the species is considered to have no potential to occur within the project site.
Accipiter cooperii	Cooper's hawk (nesting)	none/SA/none	This species occurs as an uncommon breeding resident throughout most of the low to mid-elevation wooded portions of California where it inhabits open, interrupted, or marginal woodlands. It is seldom found in areas without dense tree stands. Nest sites are typically found in riparian or	**Low Potential.** There is suitable nesting habitat for the species (i.e., interrupted riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive

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			deciduous trees in canyon bottoms or river flood plains.	upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Buteo regalis	Ferruginous hawk (wintering)	none/none/BCC	This species is a winter resident of the Modoc Plateau, Central Valley, and Coast Ranges. It forages in large, open tracts of grasslands, sparse scrubland, and deserts.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) on the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the project site.
Elanus leucurus	white-tailed kite (nesting)	none/CFP/none	This species is found as a resident throughout the lower elevation portions of California in low rolling grasslands with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. It requires grasslands, meadows, or marshes (for foraging) located near dense-topped trees (for nesting and roosting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Falco columbarius	Merlin (wintering)	none/SA/none	This species winters in California from September to May. It occurs in a variety of low elevation, relative flat habitats that include wooded areas, coastlines, open grasslands, savannah, and the periphery of lakes. It is less often found in open desert. It typically requires dense stands of trees for cover and roosting. It is most often found where there are substantial populations of small birds (the primary prey item).	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) on the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than 1.5 miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter on or immediately adjacent to the project site.
Athene cunicularia	Burrowing owl (burrow sites)	none/CSC/BCC	This species is found throughout the Central Valley, in the San Francisco Bay Area, at scattered locations along the coast, and in portions of the desert regions. It is a year-round resident in annual and perennial grasslands or other vegetation communities that support sparse or non-existent tree or shrub canopies.	**Low Potential.** Though the annual grassland on the project site provides suitable foraging habitat for the species, there is no evidence of suitable burrow sites on the project site (i.e., no California ground squirrels or their burrows, or other suitable burrow surrogates were observed on the project site). However, a small number of California ground squirrel burrows were observed in the spoils materials from the adjacent sand and gravel mining operations. Therefore, there is some potential for offsite individuals to be affected by activities on the project site.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Picoides nuttallii	Nuttall's woodpecker (nesting)	none/none/BCC	This species occurs as a resident of low-elevation riparian deciduous and oak habitats (cismontane woodland) throughout much of California with the exception of the deserts, high Sierra Nevada, and redwood belt.	**Known to Occur.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) in the southeastern portion of the project site. Furthermore, the species was heard and observed in the adjacent woodland during reconnaissance-level surveys of the project site. Therefore, the species is known to occur on the project site.
Empidonax traillii	willow flycatcher (nesting)	none/SE/BCC	This species is a rare to locally uncommon, summer resident in wet meadow and montane riparian habitats at 2000 to 8000 feet in elevation in the Sierra Nevada and Cascade Range. It also occurs at scattered locations (at lower elevations) in southern California (including along the Kern, Santa Margarita, San Luis Rey, and Santa Ynez rivers). It most often occurs in broad, open river valleys or extensive mountain meadows with dense shrubby willows. Nesting occurs between mid-May and late August in northern California.	**No Potential.** Though a migrant individual was observed in the mixed oak and riparian woodland on the project site during reconnaissance-level surveys of the site, there is no suitable riparian habitat within or adjacent to the project site that could be used as nesting habitat by this species. Furthermore, there are no records in the CNDDB below 2,000 feet in elevation anywhere in the Sierra Nevada (mostly due to nest parasitism by brown-headed cowbird). Therefore, the species has no potential to occur within the project site or otherwise be affected during nesting by the project.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Lanius ludovicianus	loggerhead shrike (nesting)	none/CSC/BCC	This species is found as a resident and wintering species throughout the lower elevation portions of California in grasslands, saltbush scrub, chaparral, oak savannah, and other open woodland types (generally where there are trees with dense cover for nesting).	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Baeolophus inornatus	Oak titmouse (nesting)	none/none/BCC	This species occurs as a common resident throughout much of California other than the deserts, high Sierra Nevada, and redwood belt. It is generally found in cismontane woodland (particularly oak or riparian woodlands) where it nests in the cavities created by woodpeckers.	**Moderate Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) in the southeastern portion of the project site. Furthermore, there are potential nest sites (i.e., woodpecker-created nest holes) in this woodland. Lastly, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have a moderate potential to occur on the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Icteria virens	yellow-breasted chat (nesting)	none/CSC/none	This species is found as a summer resident mostly in low to mid-elevation coastal, valley, foothill, and desert riparian habitats (up to 4,800 feet in foothill riparian and 6,500 feet east of the Sierra Nevada). Nesting typically occurs in dense vegetation near streams.	**Low Potential.** There is suitable nesting habitat for the species (i.e., interrupted riparian woodland with dense stands of trees) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
Chondestes grammacus	lark sparrow (nesting)	none/SA/none	This species occurs as a resident in the lowlands and foothills throughout much of California where it is found in cismontane woodland (especially oaks), open mixed chaparral, and valley and foothill grasslands with scattered trees.	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Spinus lawrencei	Lawrence's goldfinch (nesting)	none/none/BCC	This species is found as a breeding species in oak woodlands, other arid woodlands, and chaparral in the lower elevations of northern California and in riparian woodland, pinyon-juniper woodland, and lower montane communities in southern California. A local water source and a source of abundant seeds are required habitat components.	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. Furthermore, there are records from the project vicinity in the eBird data base (i.e., less than two miles from the project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest on the project site.
MAMMALS				
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST/none	This taxon is found in the San Joaquin Valley from Contra Costa County south to Kern County. It is also found in the dry interior valleys of the Coast Ranges (e.g., Salinas and Santa Clara valleys). It occurs in open, sparsely vegetated areas of low relief (typically in native or non-native grassland or alkali sink scrub).	**No Potential.** Though there is suitable habitat for the taxon on and adjacent to the project site (i.e., grassland), and it has been recorded 2.7 miles northwest and 4.8 miles southwest of the project site, there are no potential dens on the site that would be suitable for the taxon. The sandy onsite soils may preclude the creation and maintenance of larger burrows that do not collapse (hence the lack of California ground squirrel burrows). Therefore, the taxon is considered to have no potential to

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
				occur within the project site or otherwise be affected by the project.
Taxidea taxus	American badger	none/CSC/none	This species is found as a resident species at scattered localities throughout California (except in the coastal redwood region). Generally occurs in extensive, open habitats in the vicinity of abundant rodent populations.	**No Potential.** Though there is suitable habitat for the species on and adjacent to the project site (i.e., grassland), there are no potential dens on the site that would be suitable for the species. The sandy onsite soils may preclude the creation and maintenance of larger burrows that do not collapse (hence the lack of California ground squirrel burrows). Therefore, the species is considered to have no potential to occur within the project site or otherwise be affected by the project.
Antrozous pallidus	Pallid bat	none/CSC/none	This species is found as a resident in all desert, grassland, shrub, woodland, and forest habitats from sea level to approximately 6,000 feet. Day roosts are typically found in buildings, bridges, rocky outcrops, mines, caves, and trees. Night roosts are generally provided by bridges, mines, and caves.	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the project site. Therefore, it has no potential to occur on the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
Eumops perotis californicus	Western mastiff bat	none/CSC/none	This subspecies is found as an uncommon resident in southern California, but also occurs along the lower west slope of the Sierra Nevada and in the interior Coast Ranges as far north as the Tumey Hills (eastern San Benito County). Roosts are typically found in crevices in cliff faces, cracks in boulders, or occasionally in buildings (particularly where the roost allows for a large vertical drop).	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the project site. Therefore, it has no potential to occur on the project site.
Lasiurus blossevillii	Western red bat	none/CSC/none	This species occurs at scattered locations throughout the lowland portions of California west of the Sierra Nevada crest and desert regions (typically in riparian forest or orchards). It is less abundant at low and middle elevations in coniferous forest. Roosting sites are found in tree or shrub foliage between 2 and 40 ft above ground (typically in large cottonwoods, sycamores, walnuts, and willows).	**Low Potential.** There is suitable cismontane woodland for the species (i.e., mixed oak and riparian woodland) located in the southeastern portion of the project site. The large trees associated with this woodland could serve as roost sites – particularly during migration. Therefore, there is some potential, albeit low, for the species to occur on the project site.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site
FEDERAL				
	FE	Federally listed as Endangered		
	FT	Federally listed as Threatened		
	FPE	Federally proposed as Endangered		
	FPT	Federally proposed as Threatened		
	FC	Federal Candidate Species (former Category 1 candidates)		
	BCC	U.S. Fish and Wildlife Service designated “Birds of Conservation Concern” 2008		
STATE				
	SE	State listed as Endangered		
	ST	State listed as Threatened		
	SR	State listed as Rare		
	CFP	California Department of Fish and Game designated “Fully Protected”		
	CSC	California Department of Fish and Game designated “Species of Special Concern”		
	SA	California Department of Fish and Game designated “Special Animal”		
OTHER				
	CNPS List 1A	Plants presumed extinct in California		
	CNPS List 1B	Plants that are rare, threatened, or endangered in California and elsewhere		
	CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere		
	CNPS List 3	Plants about which we need more information – a review list		
	CNPS List 4	Plants of limited distribution – a watch list		
	CNPS Threat Rank 0.1	Seriously threatened in California (high degree/immediacy of threat)		
	CNPS Threat Rank 0.2	Fairly threatened in California (moderate degree/immediacy of threat)		
	CNPS Threat Rank 0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)		

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT, TULARE COUNTY

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence on Project Site

LIKELIHOOD OF OCCURRENCE DEFINITIONS

Known to Occur	Taxon was observed within or immediately adjacent to the project site or has previously been documented within or immediately adjacent to the project site.
High Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on more than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.
Moderate Potential	Taxon has not been documented within or immediately adjacent to the project site, but should be expected on less than 50% of visits to suitable habitat on and near the project site during the appropriate season and time of day.
Low Potential	Taxon has not been documented within or immediately adjacent to the project site nor is it likely to occur on or near the project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
No Potential	Taxon does not occur within or immediately adjacent to the project site due to the lack of required habitat features for the taxon, or the known range of the taxon is well defined and does not include the project vicinity.

Literature Cited

Baldwin, B. and D. Goldman. 2012. The Jepson Manual: Vascular Plants of California, 2nd edition. University of California Press, Berkeley, California. 1568 pp.

Grinnell, J. and A. Miller. 1944. The Distribution of the Birds of California. Published by the Cooper Ornithological Society. Reprinted by Artemisia Press, April 1986. 617 pp.

Ingles, L. 1978. Mammals of the Pacific States: California, Oregon, and Washington. Stanford University Press, Stanford, California. 506 pp.

Jennings, M. and M. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final report submitted to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, Contract No. 8023. 255 pp.

Small, A. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company. 342 pp.

Williams, D. 1986. Mammalian Species of Special Concern in California. Wildlife Management Division Administrative Report 86-1. 112 pp.

Zeiner, D. C., W., F. Laudenslayer, Jr., K. E. Mayer, M. White. Editors. 1990. California's Wildlife. Volume 2. Birds. State of California, Department of Fish and Game. Sacramento, California. 731 pp.

Appendix A

Standard Nine-Quadrangle CNDDB/Rarefind 3 Query for the Woodlake 7.5-Minute USGS Quad Centroid

Due to the number of occurrences generated by the CNDDB special-status plant and wildlife queries the condensed full report of occurrences have not been attached to this report, but are available as a pdf upon request to:

Michael Bumgardner
Bumgardner Biological Consulting

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or

916-638-7368 (office)
916-812-2540 (cell)

APPENDIX D-2

McKay Point Reservoir – Biological Resources Report, Addendum No. 1
(Bumgardner Biological Consulting, 2021)

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Tulare Irrigation District
McKay Point Reservoir Project Biological Resources Evaluation,
Addendum No. 1
Tulare County, California
January 2021

Introduction

This report summarizes the results of year 2020 reconnaissance-level biological resources surveys, as well as other previous surveys (Bumgardner Biological Consulting 2011, 2013), conducted within and immediately adjacent to the site of the proposed McKay Point Reservoir Project (i.e., Project) in Tulare County, California (Figure 1). The Project site includes Assessor Parcel Numbers (APNs) 113-070-016 (in part), 113-080-005, 113-080-008, 113-090-001, and 113-100-002. The Project site lies 2.5 miles southwest of Lake Kaweah; 1.5 miles southeast of Bravo Lake; 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southwest of the community of Woodlake.

Project Description

The Tulare Irrigation District (TID), Consolidated Peoples Ditch Company (CPDC) and Visalia & Kaweah Water Company (VKWC)) are joint owners (Owners) of the approximately 200 acres of land adjacent to the Kaweah and St. Johns rivers that comprise the Project site. This land is commonly referred to as the McKay Point property.

The Owners propose to construct a new reservoir (i.e., McKay Point Reservoir) on the north side of the divergence of the Kaweah and St. Johns rivers near McKay Point. The McKay Point Reservoir would serve as a surface water storage/re-regulation facility (i.e., surface water management tool). The reservoir would occupy a surface area of approximately 180 acres and would have storage capacity of approximately 4,000 acre-feet. Depths of approximately 60 feet below ground surface (bgs) are proposed. Final slopes would be 3:1, horizontal:vertical (h:v), to minimize any bank erosion from wind and water.

The Project objectives include capturing and re-regulating water made available to the Owners Owners during flood releases from Lake Kaweah; capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah; capturing and re-regulating water released for the Owners during peak power enhancement flows from the Terminus Hydropower Plant (Lake Kaweah); capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners; allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners; allowing other entities to capture and/or re-regulate

flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests; constructing the reservoir in such a way that revenue can be obtained to offset the construction and development costs; and locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

Survey Methods

The Project site, the existing access road located on the adjacent Seaborn site, and other adjacent lands within approximately 250 feet of the sites are all considered part of the Project's biological study area (BSA) and were evaluated during the biological resources surveys in 2011, 2013, and 2020 to identify evidence of special-status plants and wildlife, rare or sensitive vegetation communities, and potential jurisdictional waters or wetlands that could be affected by the Project.

The Project was initially proposed in 2011 but was delayed. The proposed Project has since been reactivated and TID, as the lead CEQA agency, has requested that the biological surveys performed in 2011 and 2013 be updated since they are now several years old. The activities proposed for the Project site have not changed significantly since 2013. However, the sand and gravel removed from the Project site during construction of the reservoir would no longer be taken offsite to the CEMEX processing plant north of the Project site. The excavated aggregate would be processed on the Project site.

There is an existing haul road directly west of the Project site located on the Seaborn site. This road would provide ingress and egress to the Project site. Hence, in addition to updating the biological resources information for the Project site, the existing access road and the areas adjacent to it located on the Seaborn site are also addressed by this report and considered part of the BSA.

The Project site and adjacent lands were surveyed by me (Michael Bumgardner, Bumgardner Biological Consulting) on May 16, 2011 and September 18, 2013. A more recent survey of the Project site (i.e., on October 15, 2020) was again conducted by me. However, the latter survey also included the existing access road on the Seaborn site (as identified above). The surveys of the BSA were conducted on foot as random meander transects, where possible, such that all potentially affected lands could be effectively evaluated. Where random meander transects were not possible, portions of the BSA were surveyed from the nearest private property boundary or through "windshield surveys." Gross-scale mapping of the vegetation communities on the Project site was conducted given that only three discernible vegetation communities occur on the site. The latter

level of mapping of the extant vegetation communities was continued for the access road on the Seaborn site (Figure 2).

An onsite search for evidence of special-status plant and wildlife species was conducted and focused on local taxa that have been recorded in the California Natural Diversity Database (CNDDB) or California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants during the 2011 and 2013 surveys. This data was updated in 2020.

The October 15, 2020 survey of the Project and adjacent areas was conducted mostly as a "windshield survey" to achieve two purposes: (1) to confirm that no substantive changes had occurred to the Project site since the 2013 survey and (2) to identify the extant vegetation communities adjacent to the existing access road on the Seaborn site and evaluate their potential to support special-status plant and wildlife species. However, a more focused survey (i.e., linear transects on 100-foot centers) was conducted by me and Tulare Irrigation District (TID) staff Jeremy Barroll and Riley Nolan (under my direction) on October 15, 2020. The latter survey was focused on finding evidence of burrowing owl, San Joaquin kit fox, and American badger.

Lastly, a reconnaissance-level search for waters with regulatory jurisdiction under the Clean Water Act, California Fish and Game Code, and/or Porter-Cologne Water Quality Control Act was conducted within the Project site boundaries.

Analytical Methods

An updated nine-quadrangle CNDDB/Rarefind 5 report was generated for the Project site (i.e., query of the USGS 7.5-minute topographic quadrangle in which the Project site is found, as well as the immediate eight surrounding topographic quadrangles, viz. Woodlake and the surrounding Stokes Mountain, Ivanhoe, Exeter, Auckland, Rocky Hill, Shadequarter Mountain, Kaweah, and Chickencoop Canyon quads). The CNDDB contains records for special-status species, as well as sensitive natural communities, which have been reported to the California Department of Fish and Wildlife (CDFW). The Rarefind 5 report for the Project site is provided in Appendix A. Each of the species identified in the Rarefind 5 report were then evaluated in terms of their likelihood of occurrence within the BSA. This evaluation considered the known distribution and habitat requirements of the species such that one of the following findings was prepared:

- Known to Occur – species was observed within or immediately adjacent to the Project site during the May 16, 2011, September 18, 2013, or October 15, 2020 survey or has previously been documented within or immediately adjacent to the Project site.

- High Potential – species has not been documented within or immediately adjacent to the Project site but should be expected on more than 50% of visits to suitable habitat in the Project site during the appropriate season and time of day.
- Moderate Potential – species has not been documented within or immediately adjacent to the Project site but should be expected on less than 50% of visits to suitable habitat in the Project site during the appropriate season and time of day.
- Low Potential – species has not been documented within or immediately adjacent to the Project site nor is it likely to occur on the Project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
- No Potential – species does not occur within the Project site due to the lack of required habitat features for the species or the known range of the species is well defined and does not include the Project site.

The findings for each of the species identified in the Rarefind 5 report are presented in this report.

Other sources of information on special-status species in California were subsequently reviewed given that the CNDDB is not inclusive of all special-status species that may occur in an area. This review was based on my professional experience within the region and elsewhere in California, but also included review of other published sources of information on special-status species in California. These latter sources include the following:

- The Jepson Manual: Vascular Plants of California (Baldwin and Goldman 2012).
- California Native Plant Society (CNPS), Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). website http://www.rareplants.cnps.org (Accessed: October 26, 2020).
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994).
- California Herps - A Guide to the Amphibians and Reptiles of California. (Nafis 2020) available at: http://www.californiaherps.com/ (Accessed October 26, 2020).
- California Bird Species of Special Concern. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California and California Department of Fish and Game (Shuford and Gardali 2008).
- The Distribution of the Birds of California (Grinnell and Miller 1944).
- California Birds: Their Status and Distribution (Small 1994).

- California's Wildlife Volume II Birds (Zeiner et al. 1990).
- eBird. 2020. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: October 26, 2020).
- Mammalian Species of Special Concern in California (Williams 1986).
- Terrestrial Mammal Species of Special Concern in California (unfinished 1998 update) (Bolster 1998).
- Mammals of the Pacific States: California, Oregon, and Washington (Ingles 1978).
- Western Bat Working Group website (http://wbwg.org/western-bat-species/).
- Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998).

Species that are known or expected to occur in the vicinity of the Project site were then further evaluated in this report.

Vegetation Communities and Site Characteristics

The description of the vegetation communities within the Project site, as described in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), is still valid as the October 15, 2020 survey found no substantive changes in the type or distribution of the onsite vegetation communities have occurred since 2013. Hence, the description and mapping of the vegetation communities described in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013) are herein incorporated by reference.

The areas within the north/northeastern portion of the Seaborn site (adjacent to the existing access road) have been used most recently to support aggregate mining and processing. As such most of the northeastern portion of the property consists of developed land uses and is barren or supports no discernible vegetation communities (Figure 2). Scattered vegetation within this portion of the Seaborn site includes but is not limited to ruderal species such as lamb's-quarters [*Chenopodium album*], deer weed [*Acmispon glaber*], common bindweed [*Convolvulus arvensis*], telegraph weed [*Heterotheca grandiflora*] and various annual grasses.

The existing access road within the Seaborn site runs along the northern boundary of the site. Vegetation along the road consists almost entirely of non-native annual grassland. Though this vegetation community supports some weedy species (e.g., broadleaf filaree

[*Erodium botrys*] and common fiddleneck [*Amsinckia menziesii*]), most of the vegetative cover is composed of non-native annual grasses (e.g., wild oat [*Avena fatua*], rattail fescue [*Vulpia myuros*], bromes [*Bromus* spp.], etc.). This latter stand of vegetation encompasses approximately 41 acres.

All other land cover adjacent to the existing access road (i.e., within 250 feet of the road) is associated with various agricultural uses (orchard, row crops, etc.).

Jurisdictional Wetlands and Other Waters

Jurisdictional wetlands or other waters of the United States are areas that cannot be dredged or filled without a permit from the U.S. Environmental Protection Agency or U.S. Army Corps of Engineers (this latter permit is commonly referred to as a "Section 404" permit in reference to the section of the federal Clean Water Act that requires such permits). Actions that require issuance of a "Section 404" permit include earth-moving activities that result in fill of jurisdictional wetlands and other waters. It should be noted that such actions may also require the issuance of state permits (e.g., California Fish and Game Code Section 1602 lake and streambed alteration agreement and/or Regional Water Quality Control Board Section (RWQCB) Section 401 clean water certification).

Wetlands or other waters of the United States are identified based on three criteria, viz. (1) soil characteristics, (2) hydrology, and (3) plant species. The U.S. Army Corps of Engineers (USACE) has developed a procedure and manual for delineating wetlands that requires comprehensive evaluation of these three criteria during field environmental assessments. A formal wetland delineation was not conducted for the purposes of this report. However, no waters that are clearly subject to the jurisdiction of the USACE, CDFW, or RWQCB, other than the St. Johns and Kaweah Rivers, occur on or immediately adjacent to the Project or Seaborn sites. The only potential exception to this latter finding is that the "daylighted" groundwaters that occur within the Seaborn site may now be jurisdictional based on the Waters of the State regulations that were approved by the Office of Administrative Law and became effective on May 28, 2020. As such, a determination of whether jurisdictional waters occur within the Seaborn site is beyond the reach of this document and will be addressed elsewhere by individuals that are more familiar with the current law and regulations addressing this issue.

Habitat Conservation Plans and Other Similar Habitat Management Plans

There are no Habitat Conservation Plans (HCPs), Natural Community Conservation Plans (NCCPs), or other approved local, regional, or state habitat conservation plans that apply to the Project site.

Special-Status Plant Species

The likelihood of occurrence evaluation for special-status plants provided in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), which did not address the Seaborn site, now addresses both the Project site, the areas adjacent to the existing access road on the Seaborn site, and other areas adjacent to the Project site (i.e., BSA). No special-status plant taxa, as described in Table 1, are associated with the BSA. Nor were any special-status plant taxa observed on or immediately adjacent to the BSA during the October 15, 2020 survey. All special-status plants that occur in the region have been discounted from having any potential to occur within the BSA due to lack of suitable habitat and/or the distribution of the taxon is well known and does not include the BSA.

Special-Status Wildlife Species

The likelihood of occurrence evaluation for special-status wildlife provided in the *Tulare Irrigation District, McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013), which did not address the Seaborn site, now addresses both the Project site, the areas adjacent to the existing access road on the Seaborn site, and other areas adjacent to the Project site . No special-status wildlife species were observed within the BSA during the October 15, 2020 survey. However, 16 special-status wildlife species that have been documented in the Project region (Table 1) are now considered to have some potential to occur in the BSA. Three (3) of these species are insects (i.e., Moestan blister beetle [*Lytta moesta*], Morrison's blister beetle [*Lytta morrisoni*], and Tulare cuckoo wasp [*Chrysis tularensis*]) that are not well known in terms of their life history and behavior, but that have been recorded in the Project vicinity in habitats like those that occur in the BSA. As such, they cannot be discounted and are considered to have some potential, albeit low, to occur in the BSA.

The previous biological resources evaluations for the Project site (Bumgardner Biological Consulting 2013, Entomological Consulting Services 2014) found evidence that a fourth special-status insect taxon (i.e., valley elderberry longhorn beetle [VELB] [*Desmocerus californicus dimorphus*]) occurs within the BSA. However, the U.S. Fish and Wildlife Service's (USFWS) review of records within the southern portion of the subspecies presumed historic range found that records for VELB's "sister subspecies" *Desmocerus californicus* had been inappropriately attributed to VELB. The USFWS subsequently removed Tulare, Kern, and Kings counties from the presumed historic range of the subspecies (USFWS 2014). VELB is therefore no longer considered a special-status species that may be affected by the Project.

Crotch bumble bee [*Bombus crotchii*] is another special-status insect species that is considered to have some potential to occur within the BSA. This finding is based on the species' historic distribution and presence of suitable habitat (e.g., relatively warm and dry sites in open grassland and scrub habitats) within the BSA. Nests of this species are often typically located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. As such, there are many places within the BSA that could be used for nesting by this species. However, given the species rapidly declining range it is not considered to have more than a low potential to occur within the BSA.

Two (2) special-status reptiles (i.e., western pond turtle [*Actinemys marmorata* formerly *Emys marmorata*] and Northern California legless lizard [*Anniella pulchra*]) are believed to have some potential, albeit low, to occur in the BSA. Regarding western pond turtle, it has been known to occur in a wide variety of still or slow-moving waters throughout California. The nearest known occurrences to the BSA are from upstream in the Kaweah River drainage. Thus, the species is considered to have some potential to occur in the aquatic habitats of the adjacent Kaweah and St. Johns rivers Lastly, the species could nest in various upland portions of the BSA.

The potential for California legless lizard to occur in the BSA is believed to be limited to the non-native annual grassland on the Project site, mainly due to the suitable soils (i.e., sands and sandy loam) that are located on the Project site. The nearest known location for the species, Kaweah Oaks Preserve, is less than 8 miles southwest of the Project site and connected via the Kaweah River corridor. Furthermore, the secretive nature of the species often results in failure to document extant occurrences. It may then occur at locations in the Project vicinity where searches for the species have simply not been conducted. As such, it is considered to have at least a low potential to occur within the BSA.

Nine (9) special-status birds are considered to have some potential to occur within the BSA. Five (5) of these latter species (Cooper's hawk [*Accipiter cooperii*], white-tailed kite [*Elanus leucurus*], loggerhead shrike [*Lanius ludovicianus*], oak titmouse [*Baeolophus inornatus*], and Lawrence's goldfinch [*Spinus lawrencei*]) are known to nest in oak or riparian woodlands. Furthermore, each of these species has been recorded nesting within less than 2 miles of the BSA. As such, each of these species, is considered to have either a low or moderate potential to nest or winter (e.g., white-tailed kite) within the BSA.

Other special-status bird species with some potential to occur in the BSA include ferruginous hawk [*Buteo regalis*], merlin [*Falco columbarius*], golden eagle [*Aquila chrysaetos*], and burrowing owl [*Athene cunicularia*].

Three (3) of the latter special-status avian species with some potential to occur within the BSA are strictly wintering species. These species (e.g., ferruginous hawk, merlin, and golden eagle) tend to be wide-ranging, often utilize fallow agricultural fields or similar open vegetation communities (e.g., annual grassland) and have substantial acreage of suitable wintering habitat within the Project vicinity. Winter occurrences of each of these species have been documented within less than 2 miles of the BSA. Therefore, these species can be expected to occur within the BSA on at least an occasional basis.

No evidence of burrowing owl (e.g., urates, regurgitated fur and feather pellets, feathers, prey remains, etc.) has been found in the BSA. In addition, no suitable burrows or burrow surrogates that could be used by the species were found within the BSA. However, California ground squirrel [*Otospermophilus beecheyi*] burrows were observed immediately offsite on the northern and eastern boundaries of the Project site. In addition, scattered California ground squirrel burrows were found in the non-native annual grassland adjacent to the existing access road along the northern boundary of the Seaborn site. However, most of these burrows had been abandoned by the ground squirrels and showed no use by any other large vertebrate species (i.e., most contained substantial cobwebs and plant debris). As such, there is potential for the species to occur adjacent to the existing access road at some point in the future and the species is considered to have at least a low potential to occur in the BSA.

Another special-status taxon that often utilizes California ground squirrel burrows is San Joaquin kit fox [*Vulpes macrotis mutica*]. The burrowing owl surveys found no evidence of this taxon in the BSA. However, this is not unexpected as the taxon does not normally range much north of Kern County on the east side of the San Joaquin Valley (i.e., it occurs principally in the "rain shadow" of the west side of the San Joaquin Valley). The nearest CNDDB occurrence of the taxon is attributed to Woodlake and is 1.5 miles northwest of the BSA. The next five nearest CNDDB occurrences are approximately 4 to 9 miles west of the BSA in the vicinity of Ivanhoe. Therefore, there is some potential for San Joaquin kit fox to occur in the BSA (mostly the western-most portions of the site), but the potential is considered low.

Designated Critical Habitat

When a species is proposed for listing as endangered or threatened under the Endangered Species Act, the USFWS and National Marine Fisheries Service (NMFS) must consider whether there are areas of habitat believed to be essential to the species' conservation. Those areas may be proposed for designation as critical habitat. Only activities that involve a federal permit, license, funding, or authorization (i.e., federal nexus) and are likely to destroy or adversely modify an area of critical habitat can be affected by the designation. In such a case, the USFWS and NMFS typically work with the appropriate federal lead agency, as well as private or other landowners (when appropriate), to amend

their project to allow it to proceed without adversely affecting the critical habitat. Thus, most projects with a federal nexus are likely to go forward, but some may be modified to minimize harm to critical habitat. Regarding the McKay Point Reservoir Project, there is no critical habitat that has been designated that includes the Project or Seaborn sites. Therefore, this issue is not addressed further in this biological resources evaluation.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
		PLANTS		
Atriplex cordulata var. *erecticaulis*	Earlimart orache	none/none/CNPS list 1B.2	This annual saltbush occurs on saline or alkaline soils in valley and foothill grassland. It is known from Kings, Kern, and Tulare counties. It blooms from August to November.	**No Potential.** No individuals of this taxon were observed within the BSA. In addition, the taxon only occurs on saline or alkaline soils in valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the taxon has no potential to occur within the BSA.
Atriplex minuscula	lesser saltscale	none/none/CNPS list 1B.1	This annual saltbush grows in sandy alkaline areas in chenopod scrub, playas, and valley and foothill grassland. It is known from Alameda, Butte, Fresno, Kern, Madera, Merced, Stanislaus, and Tulare counties. It blooms from May to October.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on sandy alkaline soils in chenopod scrub, playas, and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Atriplex persistens	vernal pool smallscale	none/none/CNPS list 1B.2	This annual saltbush occurs in claypan and alkaline vernal pools and alkaline	**No Potential.** No individuals of this species were observed within the BSA. In

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			grasslands. It has been recorded from Colusa, Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties. It blooms from June to October.	addition, the species only occurs in claypan and alkaline vernal pools and alkaline grasslands – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Brodiaea insignis	Kaweah brodiaea	none/SE/CNPS list 1B.2	This perennial bulbiferous herb occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland. It is known only from the Tule and Kaweah river drainages in Tulare County. It blooms from April to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on granitic or clay soils in cismontane woodland, meadows and seeps, and valley and foothill grassland – within the Tule and Kaweah river drainages. Therefore, the species has no potential to occur within the BSA.
Delphinium recurvatum	recurved larkspur	none/none/CNPS list 1B.2	This perennial herb occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland. It is known from Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, Solano, Sutter, San Luis Obispo, and Tulare counties. It blooms from March to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

TABLE 1

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Diplacus pictus (formerly *Mimulus pictus*)	calico monkeyflower	none/none/CNPS list 1B.2	This annual herb occurs on granitic soils (often in disturbed areas) in broad-leafed upland forest and cismontane woodland. It has been found in Kern and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on granitic soils in broad-leafed upland forest – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Eriogonum nudum var. *murinum*	mouse buckwheat	none/none/CNPS list 1B.2	This perennial herb occurs on sandy soils in chaparral, cismontane woodland, and valley and foothill grassland. It known from only 11 occurrences – all in Tulare County. It blooms from June to November.	**No Potential.** No individuals of this taxon were observed within the BSA. The taxon occurs on sandy soils in valley and foothill grassland – conditions that exist within the BSA. However, all known records are from the Three Rivers area well upstream in the Kaweah River drainage. Therefore, the taxon is considered to have no potential to occur within the BSA.
Eryngium spinosepalum	spiny-sepaled button-celery	none/none/CNPS list 1B.2	This perennial species occurs in and vernal pools, wet valley and foothill grassland, swales, and similar wetland habitats. Known occurrences have been documented in the San Joaquin	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in alkaline areas in wet valley and foothill grassland and vernal pools – conditions that do not

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			Valley (Kern to Stanislaus counties), along the Central Coast (Monterey and San Luis Obispo counties). Blooming occurs from April to May.	exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Euphorbia hooveri (formerly *Chamaesyce hooveri*)	Hoover's spurge	FT/none/CNPS list 1B.2	This annual herb occurs in association with large vernal pools. It has been recorded in Merced, Stanislaus, Butte, Glenn, Tulare, and Tehama counties but may be extirpated in Tulare County. It blooms mostly during July, but sometimes into October if there is sufficient moisture.	**No Potential.** No individuals of this species were observed within the BSA. In addition, suitable habitat (i.e., large vernal pools) does not occur within or near the BSA. Therefore, the species has no potential to occur the BSA.
Fritillaria striata	striped adobe-lily	none/SE/CNPS list 1B.1	This perennial bulbiferous herb occurs in cismontane woodland and valley and foothill grassland (usually on clay soils). It is known from Kern and Tulare counties. It blooms from February to April.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in cismontane woodland and valley and foothill grassland (usually on clay soils) – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Glyceria grandis	American manna grass	none/none/CNPS list 2.3	This perennial rhizomatous grass occurs in bogs and fens, meadows and seeps, and marshes and swamps. It is known from El Dorado, Fresno, Humboldt, Mendocino, Mono, Placer, and Tulare counties. It blooms from June to August.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in bogs and fens, meadows and seeps, and marshes and swamps – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Helianthus winteri	Winter's sunflower	none/none/CNPS list 1B.2	This perennial shrub occurs in open, ungrazed foothill woodlands and annual grasslands on well-drained, granitic soils, generally on lower-elevation, south-facing foothill slopes. It is known from Fresno and Tulare counties where it blooms year-round.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in open, ungrazed foothill woodlands and annual grasslands on well-drained, granitic soils, generally on lower-elevation, south-facing foothill slopes. Therefore, the species has no potential to occur in the BSA.
Lasthenia chrysantha	alkali-sink goldfields	none/none/CNPS list 1B.1	This annual herb occurs in vernal pools and on alkali flats. It has been found in Fresno, Kings, Kern, Lake, Madera, Merced, Placer, Solano, Stanislaus, and Tulare counties. It blooms from February to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in vernal pools and on alkali flats. Therefore, the species has no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	none/none/CNPS list 1B.1	This annual taxon is associated with heavy soils, vernal pools, low alkaline fields and hillsides, and alkaline marshes in Colusa, Kern, Los Angeles, Merced, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, Tehama, Tulare, Ventura, and Yolo counties. It blooms from February to June.	**No Potential.** No individuals of this species were observed within the BSA. In addition, suitable habitat for the taxon (alkaline marshes and other wet alkaline habitats) does not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Mimulus norrisii	Kaweah monkeyflower	none/none/CNPS list 1B.3	This annual herb occurs on carbonate or rocky soils in chaparral and cismontane woodland. It has been found in Fresno and Tulare counties. It blooms from March to May.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on carbonate or rocky soils in cismontane woodland and chaparral – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Orcuttia inaequalis	San Joaquin Valley orcutt grass	FT/SE/CNPS list 1B.1	This grass occurs in vernal pools (typically larger or more persistent pools) within valley and foothill grassland. The remaining populations	**No Potential.** No individuals of this species were observed within the BSA. In addition, it only occurs in vernal pools in valley and foothill grassland – conditions

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			of this species occur mostly in the southeastern San Joaquin Valley (Fresno, Merced, Madera, and Tulare counties). Historically, the species also occurred in Stanislaus County. It blooms from April to September.	that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Pseudobahia bahiifolia	Hartweg's golden sunburst	FE/SE/CNPS list 1B.1	This species occurs in cismontane woodland and valley and foothill grassland (almost always on shallow, well-drained, fine-textured soils - typically on clay, acidic soils) on the north or northeast facing side of Mima mounds). It has been recorded in Fresno, Madera, Merced, Stanislaus, Tuolumne, and Yuba counties. Blooming occurs from March to April.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in cismontane woodland and valley and foothill grassland on the north or northeast facing side of Mima mounds – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.
Pseudobahia peirsonii	San Joaquin adobe sunburst	FT/SE/CNPS list 1B.1	The species is known from a few mostly small occurrences along the southeastern side of the San Joaquin Valley in the interface with the Sierra Nevada foothills. It occurs on heavy clay soils in valley and foothill	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on heavy adobe clay soils in oak woodland and valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			grassland and oak woodland. It has been recorded in Fresno, Tulare, Kern, and Los Angeles counties. Blooming occurs from February to April.	species has no potential to occur in the BSA.
Sagittaria sanfordii	Sanford's arrowhead	none/none/CNPS list 1B.2	This perennial species occurs in shallow, standing, fresh water and slow-moving waterways (e.g., marshes, ponds, vernal pools, lakes, reservoirs, sloughs, ditches, unlined canals, streams, and rivers) at elevations below 2000 feet. It blooms from late May to August.	**No Potential.** No individuals of this species were observed within the BSA. The species occurs in shallow, standing, fresh water and slow-moving waterways (e.g., marshes, ponds, vernal pools, lakes, reservoirs, sloughs, ditches, unlined canals, streams, and rivers). Such habitat (i.e., standing or slow-moving waters does not occur in the BSA. Therefore, the species has no potential to occur in the BSA.
Tuctoria greenei	Greene's tuctoria	FE/SR/CNPS list 1B.1	This grass occurs in the bottom of drying vernal pools in valley and foothill grassland. It is currently known from Butte, Colusa, Glenn, Merced, Modoc, Shasta, and Tehama counties, but has previously occurred in Fresno, Madera, San Joaquin, Stanislaus, and Tulare counties where	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs in vernal pools in valley and foothill grassland – conditions that do not exist within the BSA. Therefore, the species has no potential to occur in the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			it is now believed to be extirpated. It blooms from May to September.	
INVERTEBRATES				
Branchinecta lynchi	vernal pool fairy shrimp	FT/none/none	This species occurs primarily in vernal pools (sandstone depression, grass swale, earth slump, or basalt-flow depression pools) in grassland and oak savannah of the Central Valley. However, the species also occurs at a small number of locations in the central Coast Ranges from Monterey County to Santa Barbara County as well as Riverside County.	**No Potential.** There is no suitable vernal habitat within or adjacent to the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.
Lepidurus packardi	vernal pool tadpole shrimp	FE/none/none	This species inhabits clear to turbid vernal pools and swales in the Sacramento Valley and northern San Joaquin Valley.	**No Potential.** There is no suitable vernal habitat within the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Linderiella occidentalis	California fairy shrimp	none/SA/none	Occurs primarily in vernal pools and other seasonal wetlands in grassland and oak savannah of the Central Valley. However, the species has also been recorded at scattered locations in the Coast Ranges from Mendocino County south to Ventura County.	**No Potential.** There is no suitable vernal habitat within the BSA for this species. Therefore, there is no potential for the species to be affected by the Project.
Talanites moodyae	Moody's gnaphosid spider	none/SA/none	Little is known and published about this species. However, it has been found in grasslands under rocks (generally serpentine) on rocky mounts, buttes, and hilltops. Only six known occurrences are reported – all from Fresno and Tulare counties.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species only occurs on rocky mounts, buttes, or hilltops (usually under serpentine rocks) – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within either of the two sites.
Lytta moesta	Moestan blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in Fresno, Kern, Madera, Santa Cruz, Stanislaus, and Tulare counties. The CDFW reports that little is known about the life history and	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as not occurring within the BSA. Therefore, it is

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			behavior of this species. However, it has been collected from March to September and has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	considered to have some potential, albeit low, to occur on the BSA.
Lytta morrisoni	Morrison's blister beetle	none/SA/none	The range of this species is not well known, but occurrences have been documented in the southern San Joaquin Valley in Kern, Fresno, Tulare, San Benito, and San Luis Obispo counties. The CDFW reports that life history and behavior information for the species does not exist. However, it has typically been found in association with its host species (i.e., the species' larvae feed on the pollen stores that ground-nesting solitary bees have provided for their own larvae).	**Low Potential.** Given that ground-nesting solitary bees (i.e., beetle's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted as not occurring within the BSA. Therefore, the species has some potential, albeit low, to occur within either of the two sites.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT/none/none	This subspecies occurs at scattered locations in the Central Valley and adjacent foothills of the Sierra Nevada and Coast Ranges. It is entirely dependent upon its host plant (i.e., elderberry spp.) and is only found where this shrub occurs (typically in riparian vegetation associations, but occasionally in single, isolated shrubs or stands of the plant). The southern limit of its range in and near the San Joaquin Valley now only extends to Fresno County.	**No Potential.** Many old growth elderryberry shrubs occur within the Project site and observations of valley longhorn beetles and their exit holes at the site were tentatively assigned to the listed subspecies in 2014. However, review by the USFWS has subsequently resulted in the removal of Kings, Kern, and Tulare counties from the subspecies' presumed historic range. Therefore, the subspecies has no potential to occur within the BSA.
Chrysis tularensis	Tulare cuckoo wasp	none/SA/none	This species is known only from a small series of specimens that have been collected in Amador, Fresno, Monterey, and Tulare counties. Cuckoo wasps are nest parasitoids of predatory wasps and sawflies. However, the host species of this species are unknown. Adults have been found from April to June in open,	**Low Potential.** Given that predatory wasps and sawflies (i.e., wasp's host species) are widely distributed in California and little is known about this species' life history and behavior, it cannot be discounted from occurring within the BSA. Furthermore, the nearest known record to the Project site is from north of Road 212 and Avenue 344 (less than 3 miles from the Project site).

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			sunny habitats with abundant flowers and small shrubs, where they feed on nectar.	Therefore, it is considered to have some potential, albeit low, to occur within the BSA.
Bombus crotchii	Crotch bumble bee	none/SA/none	This species occurs from coastal California east to the Sierra Nevada-Cascade crest. It occurs at relatively warm and dry sites in open grassland and scrub habitats. Colonies are annual and only the new, mated queens overwinter. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees.	**Low Potential.** Given this species' historic distribution and the lack of focused species-specific surveys, it cannot be discounted from occurring on the Project site. Therefore, it is considered to have some potential, albeit low, to occur within the BSA.
AMPHIBIANS				
Ambystoma californiense	California tiger salamander	FT/ST/none	This species is found in annual grassland, oak savannah, and coastal sage scrub adjacent to vernal pools, stock ponds, and ponded reaches of ephemeral streams (aquatic breeding	**No Potential.** No suitable aquatic breeding habitat for the species (i.e., vernal pools or other seasonal wetlands) occurs within the BSA. Furthermore, the nearest known occurrences of the species (at and near the

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			sites). The species is patchily distributed in the Central Valley from Yolo County to Kings County, but also occurs in Alameda and Contra Costa counties south through the interior valleys of the Coast Ranges. Disjunct populations occur in Santa Barbara County and Sonoma County.	Stone Corral Ecological Reserve east of Yettem) are more than 11 miles west of the Project site. Lastly, the BSA is landlocked by agricultural land uses that would preclude the species from reaching the two sites from offsite wetlands that could be used by the species. Therefore, it has no potential to occur within the BSA.
Batrachoseps regius	Kings River slender salamander	none/SA/none	This species has been found in Fresno County on the south and east sides of the North Fork of the Kings River and at Summit Meadow in the drainage of the South Fork of the Kings River. It has also been found in the drainage of the middle fork of the Kaweah River in Tulare County. It occurs in talus, under rocks and downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest above 1,100 and 8,100 feet in elevation.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species has only been recorded in talus, under rocks, under downed logs, and in leaf litter in chaparral, cismontane woodland, and montane coniferous forest between 1,100 and 8,100 feet in elevation– conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Rana boylii	foothill yellow-legged frog (East/Southern Sierra Clade)	none/SE/none	This species was historically distributed throughout the foothill portions of the Sierra Nevada and Coast Ranges drainages from the Oregon border to the San Gabriel River (Los Angeles County). The species requires shallow, small to moderate streams (typically perennial waters with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs). The East/Southern Sierra Clade extends from the South Fork American River Subbasin to where the Sierra Nevada meet the Tehachapi Mountains.	**No Potential.** No individuals of this species were observed within the BSA. In addition, the species requires shallow, small to moderate streams (typically perennial waters) with some cobble-sized substrate and riffle habitat above 600 feet in elevation and without bullfrogs – conditions that do not exist within the BSA. Therefore, the species has no potential to occur within the BSA.
Lithobates pipiens	northern leopard frog (native populations only)	none/CSC/none	Historical populations of this species in California existed in scattered locations below 6,500 feet in Siskiyou and Modoc counties and in the northern Owens Valley. Individuals of unknown origin were introduced into El Dorado, Kern, Los Angeles,	**No Potential.** No individuals of this species were observed within the BSA. In addition, the only known population in the region, recorded near Orosi in Tulare County, is an introduced population and is therefore not a special-status species. Hence, there is no available information to

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			Merced, San Francisco, Sierra, Tehama, and Tulare counties between 1905 and 1970. Several of these introduced populations experienced rapid growth and range expansions before completely disappearing. Except for a small population that is currently present in Merced County, all these introduced populations have perished. It has been found in grassland, wet meadows, potholes, forests, woodland, brushlands, springs, canals, bogs, marshes, reservoirs (generally where there is permanent water with abundant aquatic vegetation).	suggest that any native populations have the potential to occur within the BSA.
Spea hammondii	western spadefoot	none/CSC/none	This species is found in dry habitats (e.g., annual grassland, oak savannah and woodland, and coastal sage scrub) adjacent to vernal pools, stock ponds, and overflow channels of low-gradient drainages within the Central Valley and coastal California from Monterey	**No Potential.** No suitable aquatic breeding habitat for the species occurs within the BSA. Furthermore, the BSA is relatively landlocked by semi-perennial rivers, sand and gravel mining operations, and agricultural uses that would preclude movement of the species from more suitable habitats located in the Project

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			County to San Diego County.	vicinity (e.g., lands north of Highway 216). Consequently, the species is considered to have no potential to occur within the BSA.
REPTILES				
Actinemys marmorata formerly *Emys marmorata*	western pond turtle	none/CSC/none	This species historically occurred throughout most of the Pacific-slope drainages in California (below approximately 4,000 feet). The species now occurs at scattered locations throughout its former range (primarily in the central Sierra Nevada foothills, Central Valley, San Francisco Bay area, and north-central coast and Coast Ranges. It occurs in and adjacent to ponds, reservoirs, or other slow-moving perennial aquatic habitats (e.g., sloughs, streams, and rivers). The species may be active year-round in some parts of its range.	**Low Potential.** Given that potentially suitable habitat is provided by the adjacent Kaweah and St. Johns rivers and the species has been recorded upstream in the Kaweah River, it cannot be discounted from occurring within BSA. In addition, individuals could also occur in the upland portions of the BSA during egg-laying. Therefore, it is considered to have some potential, albeit low, to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Anniella pulchra	Northern California legless lizard	none/CSC/none	This species occurs as a fossorial species in sand, sandy loam, or leaf-mold substrates. It can be found in a variety of habitats that include coastal beach, chaparral, pine-oak woodland, and riparian habitats. Soil moisture is essential. It appears to be active mostly during the morning and evening, just beneath the surface of sunlight-warmed substrate. It may also be active on the surface at night when substrate temperatures remain warm for extended intervals. It should be noted that recent mitochondrial and nuclear DNA work has resulted in the species being split into five distinct species with the local species (*A. pulchra*) occurring only along the coast, in the Coastal Ranges as far south as northwestern Ventura County and in parts of the San Joaquin Valley.	**Low Potential.** No individuals of this species were observed during the reconnaissance-level surveys of the BSA. However, there is a relatively recent occurrence (2015) documented in the CNDDB from about 0.2 miles northwest of Highway 198 at Road 180, in the vicinity of Outside Creek and Johnson Slough, about 6.5 miles east of Visalia.in the Kaweah Oaks Preserve. Therefore, given the presence of suitable habitat (primarily on the Project site), the species is considered to have some potential, albeit low, to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			BIRDS	
Phalacrocorax auritus	double-crested cormorant (nesting)	none/SA/none	This species is found as a colonial nester on coastal cliffs and offshore islands, and along lake and river margins in the interior portions of California. It nests along the coast on sequestered islets, usually on ground with sloping surface, or in tall trees or snags along lake or river margins.	**No Potential.** A colonial nest site was found in a couple of snags between the southern access road and the mining pit pond on the Seaborn property (outside the BSA). It was not active at the time of the survey given the time of year (October). So, it could not be determined when it was last occupied. However, it is the only colonial nesting site for the species in the area and is outside the BSA. Therefore, the Project would not adversely affect nesting by this species.
Ardea herodias	great blue heron (nesting colony)	none/SA/none	This species is common throughout most of California where there are shallow estuaries, or freshwater or saltwater emergent wetlands. However, it is less common along riverine and rocky coastal shores and above the foothills in the mountains. Rookeries (i.e., nesting colonies) are	**No Potential.** No nesting colonies of this species have been observed within the BSA. In addition, the nearest reported nesting colony is on Dry Creek, one mile north of the confluence of Dry Creek and the Kaweah River (more than two miles from the Project site). Therefore, no known or potential nesting colonies of this species

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			typically active from February to late July and occur in the tops of secluded large snags or live trees. Rookeries are sometime shared with the great egret or other large wading birds.	occur within the BSA.
Gymnogyps californianus	California condor	FE/SE/none	This species occurs as a reintroduced species primarily in the mountains of Ventura, Santa Barbara, Los Angeles, Monterey, and San Benito counties. However, individuals are known to be wide-ranging and occasionally occur soaring over the Tehachapi Mountains and southern Sierra Nevada. The species is strictly a scavenger and may travel up to 35 miles or more from roost sites in search of carrion. Most foraging occurs in open habitats that facilitate landings and takeoffs. Traditional roost sites are on cliffs or ledges, but snags and trees in old growth coniferous forest may be used.	**No Potential.** No suitable roost sites for this species occur within the BSA. In addition, other potential attractors to the sites (e.g., large mammals and potential food sources) are not provided at or near the BSA. Lastly, the nearest known use areas for this species are in more rugged country more than 13 miles southeast of the BSA. Therefore, the species is considered to have no potential to occur within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Accipiter cooperii	Cooper's hawk (nesting)	none/SA/none	This species occurs as an uncommon breeding resident throughout most of the low to mid-elevation wooded portions of California where it inhabits open, interrupted, or marginal woodlands. It is seldom found in areas without dense tree stands. Nest sites are typically found in riparian or deciduous trees in canyon bottoms or river flood plains.	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., interrupted oak woodland with dense stands of trees within the BSA. However, there are only a small number of scattered nesting season records from the Project vicinity in the eBird data base. Nonetheless, this relatively secretive species is considered to have a moderate potential to nest within the BSA.
Buteo swainsoni	Swainson's hawk (nesting)	none/ST/none	Occurs as a breeding resident in the Central Valley (primarily in the southern Sacramento and northern San Joaquin valleys), Klamath Basin, and Modoc Plateau. However, nesting pairs are also occasionally found in the Mojave Desert, Lanfair Valley (San Bernardino County), Antelope Valley (Los Angeles County), and eastern San Luis Obispo County. In the Central Valley the species nests in riparian woodland or forest stands, or oak	**No Potential.** Though suitable nesting habitat for the species occurs within the BSA (i.e., interrupted oak woodland), the nearest known nesting records for the species are more than 17 miles west of these sites in the vicinity of Traver. As such, the species is considered to have no potential to nest within the BSA.

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			savannah. Nest territories are located adjacent to suitable foraging habitat (e.g., grassland, suitable grain and row crop fields, alfalfa, and pastures).	
Buteo regalis	ferruginous hawk (wintering)	none/none/BCC	This species is a winter resident of the Modoc Plateau, Central Valley, and Coast Ranges. It forages in large, open tracts of grasslands, sparse scrubland, and deserts.	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Elanus leucurus	white-tailed kite (nesting and wintering)	none/CFP/none	This species is found as a resident throughout the lower elevation portions of California in low rolling grasslands with scattered oaks and river bottomlands or marshes adjacent to deciduous woodland. It requires grasslands, meadows, or marshes (for foraging) located near dense-topped	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak woodland) within the BSA. However, there is only one eBird record from the nesting season in the Project vicinity. Nonetheless, there are several eBird records from the Project vicinity during the winter months. Therefore, the species is considered to have

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			trees (for nesting and roosting).	some potential, albeit low, to occur on the BSA (but mostly during the winter months).
Haliaeetus leucocephalus	bald eagle (nesting and wintering)	none/SE/BCC	The species winters throughout California at lakes, reservoirs, rivers, and some rangelands and coastal wetlands. Nesting occurs mainly in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers. Most current nest territories are in northern California, but the species also nests in various locations in the central and southern Sierra Nevada mountains and foothills, in several locations in the central Coast Ranges, inland southern California, and Santa Catalina Island. The nesting season lasts from January through August.	**No Potential.** No individuals of this species were observed during any of the reconnaissance-level surveys of the BSA. There are multiple winter eBird occurrences scattered around nearby Dry Creek and Bravo Lake (sites where public access allows for potential observations - unlike the BSA). However, the species is considered to have no potential to occur within the BSA due to the lack of suitable roost sites or abundant and suitable prey species (e.g., fish or waterfowl).
Aquila chrysaetos	golden eagle (nesting and wintering)	none/CFP/BCC	Found as a breeding resident throughout most of California (other than the valley floor of the Central Valley). Also found as a wintering species throughout most of California	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			(other than the high Sierra Nevada). Species requires open terrain for hunting (e.g., grassland, oak savannah, and early successional stages of shrub and woodland habitats). Typically nests on secluded cliffs, but may also use large, isolated trees.	from the BSA along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Falco columbarius	merlin (wintering)	none/SA/none	This species winters in California from September to May. It occurs in a variety of low elevation, relative flat habitats that include wooded areas, coastlines, open grasslands, savannah, and the periphery of lakes. It is less often found in open desert. It typically requires dense stands of trees for cover and roosting. It is most often found where there are substantial populations of small birds (the primary prey item).	**Low Potential.** There is suitable wintering habitat for the species (i.e., open grassland) within the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than 1.5 miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to winter within the BSA.
Athene cunicularia	burrowing owl (burrow sites)	none/CSC/BCC	This species is found throughout the Central Valley, in the San Francisco Bay Area, at scattered locations along the coast, and in portions of the desert	**Low Potential.** The annual grassland within the BSA provides suitable foraging habitat for the species. In addition, scattered California ground squirrel burrows occur in

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			regions. It is a year-round resident in annual and perennial grasslands or other vegetation communities that support sparse or non-existent tree or shrub canopies.	the far western portion of the BSA. Though no evidence of occupation by burrowing owls was found at these burrows, it does not preclude their future use. Therefore, there is some potential, albeit low, for the species to occur within the far western portion of BSA.
Empidonax traillii	willow flycatcher (nesting)	none/SE/BCC	This species is a rare to locally uncommon, summer resident in wet meadow and montane riparian habitats (typically dense willow scrub) at 2000 to 8000 feet in elevation in the Sierra Nevada and Cascade Range. It also occurs at scattered locations (at lower elevations) in southern California (including along the Kern, Santa Margarita, San Luis Rey, and Santa Ynez rivers). It most often occurs in broad, open river valleys or extensive mountain meadows with dense shrubby willows. Nesting occurs between mid-May and late August in northern California.	**No Potential.** Though a migrant individual was observed in the mixed oak woodland on the Project site during the 2013 reconnaissance-level survey of the site, there is no suitable riparian habitat within the BSA that could be used as nesting habitat by this species (i.e., extensive, dense willow scrub). Furthermore, there are no records in the CNDDB below 2,000 feet in elevation anywhere in the Sierra Nevada (mostly due to nest parasitism by brown-headed cowbird). Therefore, the species has no potential to occur within the BSA as a nesting species.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Lanius ludovicianus	loggerhead shrike (nesting)	none/CSC/BCC	This species is found as a resident and wintering species throughout the lower elevation portions of California in grasslands, saltbush scrub, chaparral, oak savannah, and other open woodland types (generally where there are trees with dense cover for nesting).	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland with dense stands of trees) located in the southeastern portion of the BSA. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive). Therefore, the species is considered to have a moderate potential to nest within the BSA.
Vireo bellii pusillus	least Bell's vireo (nesting)	FE/SE/none	Found as a summer resident (late March to late August) in coastal valleys from Monterey County south through coastal southern California to San Diego County. Also occurs at scattered locations along the western border of the deserts. There have been recent records from the Central Valley given its recovery in southern California. It typically nests in dense willow riparian communities but is also	**No Potential.** Though there is no suitable nesting habitat for this subspecies within the BSA, and the subspecies had been extirpated from the Central Valley, it has recently been found sporadically again in the valley (e.g., one nesting record from Merced NWR in 2012). Nonetheless, the subspecies is considered to have no potential to occur within the BSA given the extremely limited number of records in the Central Valley and distance to those recent

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			occasionally found in live oak stands adjacent to drainages.	records.
Baeolophus inornatus	oak titmouse (nesting)	none/none/BCC	This species occurs as a common resident throughout much of California other than the deserts, high Sierra Nevada, and redwood belt. It is generally found in cismontane woodland (particularly oak or riparian woodlands) where it nests in the cavities created by woodpeckers.	**Moderate Potential.** There is suitable nesting habitat for the species (i.e., oak woodland) within the BSA. Furthermore, there are potential nest sites (i.e., woodpecker-created nest holes) in these woodlands. Lastly, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have a moderate potential to occur within the BSA.
Icteria virens	yellow-breasted chat (nesting)	none/CSC/none	This species is found as a summer resident mostly in low to mid-elevation coastal, valley, foothill, and desert riparian habitats (up to 4,800 feet in foothill riparian and 6,500 feet east of the Sierra Nevada). Nesting typically occurs in dense riparian vegetation near streams.	**No Potential.** There is no dense riparian vegetation within the BSA. Though there are records from the Project vicinity in the eBird data base (i.e., multiple records from along Dry Creek Drive in the vicinity of the Kaweah Gravel Pits and a couple of records from the riparian habitat associated with Bravo Lake), the BSA does not provide the

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
				type of dense riparian habitat (e.g., willow scrub) used as nesting habitat by the species in the western United States. Therefore, the species has no potential to occur within the BSA as a nesting species.
Agelaius tricolor	tricolored blackbird (nesting)	none/CSE/BCC	The species is a resident species in annual grassland, oak savannah and freshwater marsh within the Central Valley and coastal California from Sonoma County to San Diego County. Nesting habitat typically involves emergent freshwater marsh, but may include tall, dense stands of willow, blackberry, thistle, nettles, or grasses. Grasslands or rangeland providing an abundant source of food (e.g., large numbers of grasshoppers or butterfly larvae) often are within at least three miles of nest colonies.	**No Potential.** There is a CNDDB occurrence from about 1.3 miles west-northwest of Lake Kaweah Dam, 2 miles north of the Highway 216 and 198 intersection, and 4 miles east of Woodlake. However, there is no suitable nesting habitat (e.g., vegetation that is flooded, spinous, or otherwise defended against easy access by mammalian predators) for the species within the BSA. Therefore, it is considered to have no potential to nest within the BSA.
Spinus lawrencei	Lawrence's goldfinch (nesting)	none/none/BCC	This species is found as a breeding species in oak woodlands, other arid woodlands, and chaparral in the lower	**Low Potential.** There is suitable nesting habitat for the species (i.e., mixed oak and riparian woodland) located in the

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
			elevations of northern California and in riparian woodland, pinyon-juniper woodland, and lower montane communities in southern California. A local water source and a source of abundant seeds are required habitat components.	southeastern portion of the Project site. Furthermore, there are records from the Project vicinity in the eBird data base (i.e., less than two miles from the Project site along Dry Creek Drive upstream along the Kaweah River). Therefore, the species is considered to have some potential, albeit low, to nest in the BSA.
MAMMALS				
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST/none	This taxon is found in the San Joaquin Valley from Contra Costa County south to Kern County. It is also found in the dry interior valleys of the Coast Ranges (e.g., Salinas and Santa Clara valleys). It occurs in open, sparsely vegetated areas of low relief (typically in native or non-native grassland or alkali sink scrub).	**Low Potential.** Though there is suitable habitat for the taxon within the BSA (i.e., non-native annual grassland), and it has been recorded 2.7 miles northwest and 4.8 miles southwest of the Project site, surveys of the annual grassland within the BSA found no potential dens or other evidence of the taxon to suggest it occurs within the BSA. In addition, the sandy soils on the Project site may preclude the creation and maintenance of burrows that do not easily collapse (hence the lack of California ground squirrel burrows). Therefore, the

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Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
				taxon is considered to have only a low potential to occur in the annual grassland associated with the easternmost and northernmost portions of the BSA.
Taxidea taxus	American badger	none/CSC/none	This species is found as a resident species at scattered localities throughout California (except in the coastal redwood region). Generally, occurs in extensive, open habitats in the vicinity of abundant rodent populations.	**No Potential.** Though there is suitable habitat for the species within the BSA (i.e., non-native annual grassland), surveys have found no evidence to suggest that the species occurs within the BSA (i.e., suitable dens or diggings). In addition, the BSA is fragmented from other habitat that could be occupied by the species. Therefore, the species is considered to have no potential to occur within the BSA or otherwise be affected by the Project.
Antrozous pallidus	pallid bat	none/CSC/none	This species is found in a variety of habitats from sea level to approximately 6,000 feet. Day roosts are typically found in buildings, bridges, rocky outcrops, mines, caves, and trees. Night roosts are generally provided by bridges, mines, and caves.	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the BSA. Therefore, it has no potential to occur within the BSA.

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SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
Eumops perotis californicus	western mastiff bat	none/CSC/none	This subspecies is found as an uncommon resident in southern California, but also occurs along the lower west slope of the Sierra Nevada and in the interior Coast Ranges as far north as the Tumey Hills (eastern San Benito County). Roosts are typically found in crevices in cliff faces, cracks in boulders, or occasionally in buildings (particularly where the roost allows for a large vertical drop).	**No Potential.** No suitable day or night roosts for the species occur on or immediately adjacent to the BSA. Therefore, it has no potential to occur within the BSA.
Lasiurus blossevillii	western red bat	none/CSC/none	The species occurs throughout the lowland portions of California west of the Sierra Nevada crest and desert regions (typically in riparian forest or orchards). It is less abundant in coniferous forest. Roosting sites are found in tree or shrub foliage between 2- and 40-feet above ground (typically in large cottonwoods, sycamores, walnuts, and willows).	**No Potential.** Though suitable habitat and roosts for the species occur within the BSA, there are no known occurrences from Tulare County. The nearest records to the BSA (2 records) are from northwestern Fresno County. Therefore, the species is considered to have no potential to occur within the BSA.

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA
FEDERAL				
	FE	Federally listed as Endangered		
	FT	Federally listed as Threatened		
	FPE	Federally proposed as Endangered		
	FPT	Federally proposed as Threatened		
	FC	Federal Candidate Species (former Category 1 candidates)		
	BCC	U.S. Fish and Wildlife Service designated "Birds of Conservation Concern" 2008		
STATE				
	SE	State listed as Endangered		
	ST	State listed as Threatened		
	SR	State listed as Rare		
	CSE	State Designated as Candidate for Listing as Endangered		
	CFP	California Department of Fish and Wildlife designated "Fully Protected"		
	CSC	California Department of Fish and Wildlife designated "Species of Special Concern"		
	SA	California Department of Fish and Wildlife designated "Special Animal"		
OTHER				
	CNPS List 1A	Plants presumed extinct in California		
	CNPS List 1B	Plants that are rare, threatened, or endangered in California and elsewhere		
	CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere		
	CNPS List 3	Plants about which we need more information – a review list		
	CNPS List 4	Plants of limited distribution – a watch list		
	CNPS Threat Rank 0.1	Seriously threatened in California (high degree/immediacy of threat)		
	CNPS Threat Rank 0.2	Fairly threatened in California (moderate degree/immediacy of threat)		
	CNPS Threat Rank 0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)		

TABLE 1

SPECIAL-STATUS SPECIES RECORDED OR POTENTIALLY OCCURRING WITHIN THE VICINITY OF THE MCKAY POINT RESERVOIR PROJECT SITE AND SEABORN SITE, BIOLOGICAL STUDY AREA, TULARE COUNTY, CALIFORNIA

Genus/Species	Common Name	Status Federal/CA/Other	Habitats and Seasonal Distribution in California	Likelihood of Occurrence in the BSA

LIKELIHOOD OF OCCURRENCE DEFINITIONS

Known to Occur	Taxon was observed within or immediately adjacent to the Project site during the May 16, 2011, September 18, 2013, or October 15, 2020 surveys or has previously been documented within or immediately adjacent to the Project site.
High Potential	Taxon has not been documented within or immediately adjacent to the Project site but should be expected on more than 50% of visits to suitable habitat on and near the Project site during the appropriate season and time of day.
Moderate Potential	Taxon has not been documented within or immediately adjacent to the Project site but should be expected on less than 50% of visits to suitable habitat on and near the Project site during the appropriate season and time of day.
Low Potential	Taxon has not been documented within or immediately adjacent to the Project site nor is it likely to occur on or near the Project site, but its presence cannot be completely discounted due to incomplete information on the taxon's distribution or habitat requirements.
No Potential	Taxon does not occur within or immediately adjacent to the Project site due to the lack of required habitat features for the taxon, or the known range of the taxon is well defined and does not include the Project vicinity.

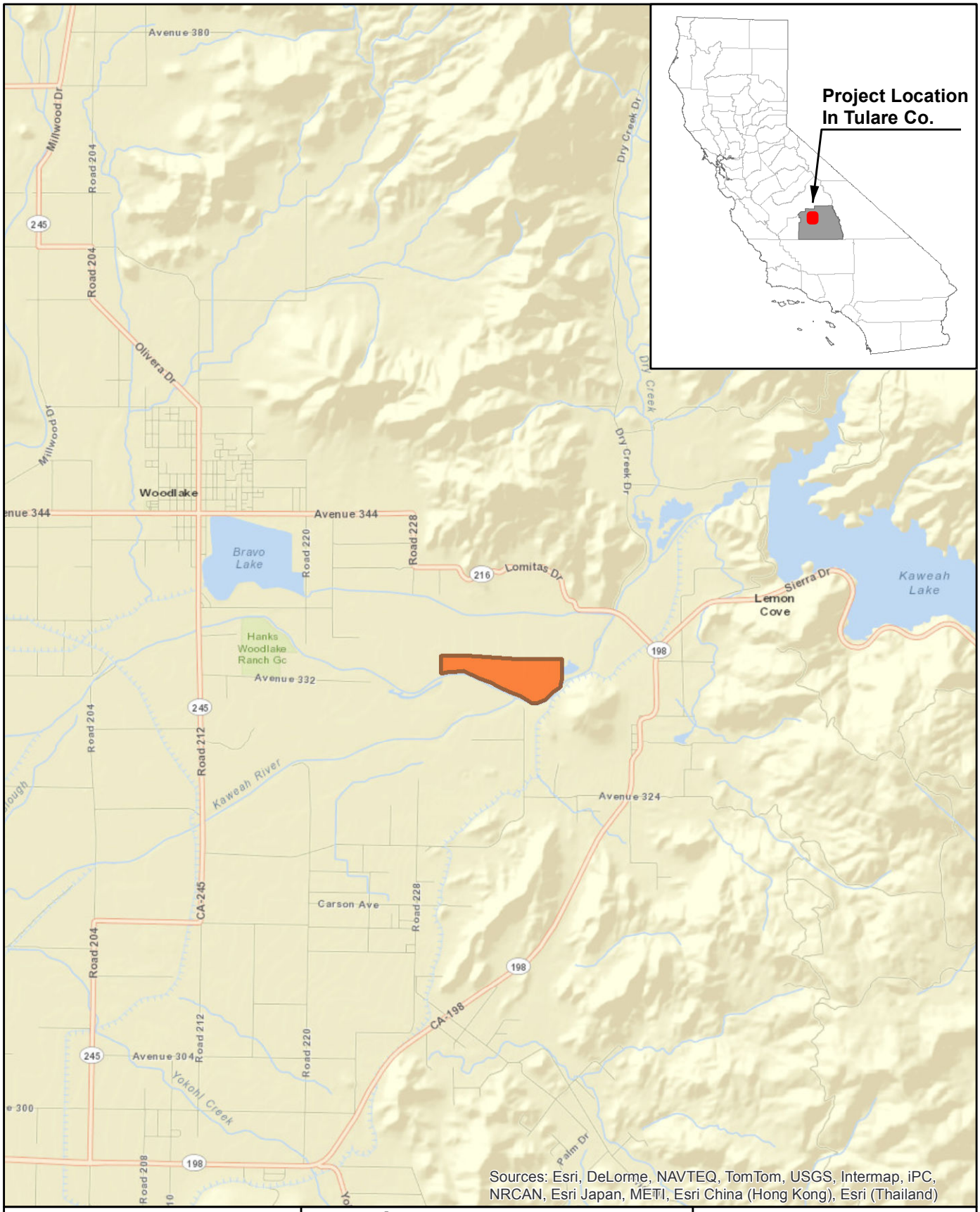
Note: This table has changed from that provided with the *Tulare Irrigation District McKay Point Reservoir Project Biological Resources Evaluation, Tulare County, California* (Bumgardner Biological Consulting 2013) given the following: (1) addition of special-status species that were previously undocumented in the query area, (2) addition of new occurrences of special-status species that had previously been document in the query area (3) changes to the state and/or federal regulatory status of species that had previously been documented in the query area., and (4) removal of some species from the CDFW Special Animals List. Hence, this table replaces Table 1 from the 2013 Biological Resources Evaluation.

Literature Cited

Bumgardner Biological Consulting. 2013. Tulare Irrigation District, McKay Point Reservoir Project, Biological Resources Evaluation, Tulare County, California. 37 pp.

Entomological Consulting Services. 2014. Elderberry Inventory Report for the Proposed Reservoir of the Tulare County Irrigation District at McKay Point near Visalia, CA. 12 pp.

U.S. Fish and Wildlife Service (USFWS). 2014. Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule To Remove the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife, 79 Fed. Reg. 55874 (September 17, 2014)



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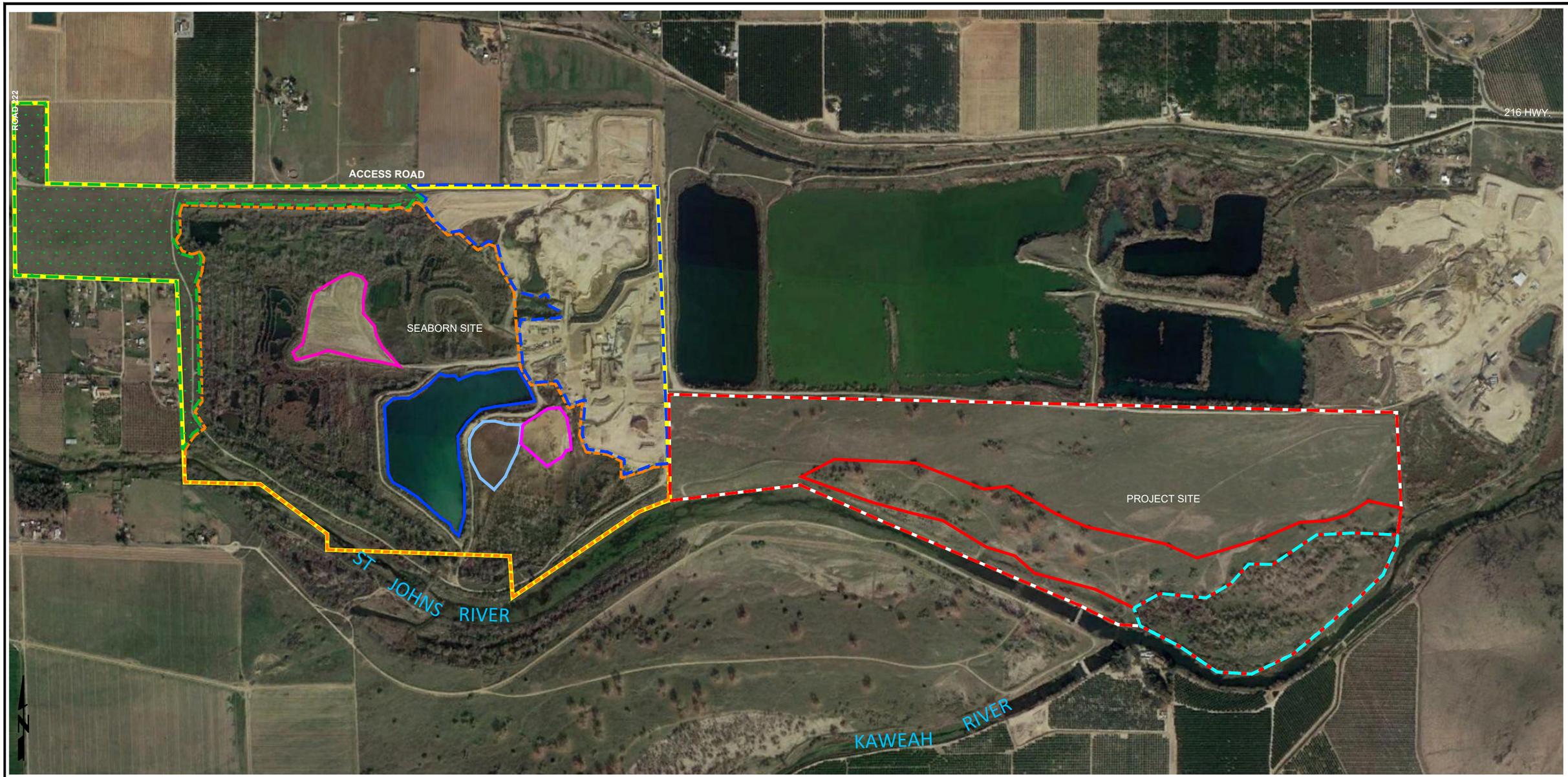
Project Site

McKay Point Reservoir

Tulare ID
Consolidated Peoples DC
Visalia & Kaweah WC

Figure 1 – Location Map

10/31/2013 : V:\Clients\Tulare ID-1248\124808C1-McKays Point Reservoir\GIS\Map\Revised\Location.mxd



2000 0 2000 4000

SCALE IN FEET

LEGEND

- SEABORN SITE
- ELDERBERRY SAVANNAH RIPARIAN WOODLAND
- MIXED OAK RIPARIAN WOODLAND
- NON NATIVE ANNUAL GRASSLAND
- COTTONWOOD - WILLOW RIPARIAN WOODLAND
- DREDGE POND
- DEVELOPED LAND USE
- CATTAIL MARSH
- RUDERAL
- NON - NATIVE ANNUAL GRASSLAND

DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/05/2018

SESPE CONSULTING, INC.
374 Poli Street, Suite 200 • Ventura, CA 93001
(805) 275-1515 • www.sespeconsulting.com

EXISTING VEGETATION COMMUNITIES ON THE MCKAY PT. RESERVOIR SITE AND ADJACENT SEABORN SITE

SCALE: HORIZ: AS SHOWN
VERT: AS SHOWN
DRAWN BY: G.CAMUS
CHECKED BY: GS
FIGURE NUMBER 2
DATE: OCTOBER 2021

S:\TU01-Tulare Irrigation District\CAD\TU01-Tulare Bio_Figure 1_10-7-21.dwg Oct 12, 2021, 2:18pm GJC

Appendix A

Standard Nine-Quadrangle CNDDB/Rarefind 5 Query for the Woodlake 7.5-Minute USGS Quad Centroid

Due to the number of occurrences generated by the CNDDB special-status plant and wildlife queries the condensed full report of occurrences have not been attached to this report, but are available as a pdf upon request to:

Michael Bumgardner
Bumgardner Biological Consulting

michael.bumgardner@att.net

or

916-638-7368 (office)
916-812-2540 (cell)

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APPENDIX D-3

Elderberry Inventory Report for the Proposed Reservoir
(Entomological Consulting Services, Ltd., 2014)

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ELDERBERRY INVENTORY REPORT

FOR THE PROPOSED RESERVOIR

OF THE TULARE COUNTY IRRIGATION DISTRICT

AT MCKAY POINT NEAR VISALIA, CA

Prepared for:
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Prepared by:
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May 2014

INTRODUCTION

The Tulare County Irrigation District is proposing to construct a new reservoir at McKay Point, immediately north of the confluence of the Kaweah and St. John's Rivers northeast of Visalia, CA (Figure 1). It is known as the McKay Point Reservoir. The proposed project site consists of five neighboring parcels (Figure 2), which collectively measure 194 acres. Blue elderberry (*Sambucus mexicana*: Caprifoliaceae) plants grow in various portions of the project site and many of them could be directly or indirectly impacted by construction of the proposed reservoir.

Blue elderberry is the sole food plant for the Valley Elderberry Longhorn beetle (VELB), *Desmocerus californicus dimorphus* (Coleoptera: Cerambycidae). The VELB is recognized as a threatened species pursuant to provisions of the federal Endangered Species Act of 1973, as amended. Removal of the beetle's elderberry food plant is interpreted as "take" of the threatened beetle's habitat as defined by the Endangered Species Act. Lawful removal of the elderberry food plant of the VELB can be performed after obtaining a permit for incidental take from the U.S. Fish & Wildlife Service (USFWS).

This report describes the findings of an inventory survey of the resident elderberry plants that was performed in April 2014 at the McKay Point Reservoir project site. The purpose of the inventory was to acquire information on the resident elderberry plant to determine appropriate mitigation measures that may be needed for the reservoir project.

Inventory data were collected at this site in accordance with the procedures described by the VELB conservation guidelines (USFWS 1999). Data from the inventory were used to perform a mitigation analysis for the elderberry plants that will be impacted by the project. The findings of the analysis were used to prepare a mitigation plan that discusses two alternative mitigation solutions, namely:

a) purchase VELB conservation credits from an USFWS-approved conservation bank, whose service territory includes the McKay Point Reservoir project site; or

b) protect a suitable mitigation site and revegetate it with the requisite number of elderberries and associated native plants and monitor it for a minimum of 10 years to demonstrate that the habitat restoration is successful.

BACKGROUND INFORMATION

In 1980, the USFWS recognized the VELB as a threatened species and designated two sites along the American River in the city of Sacramento as critical habitat (USFWS 1980). A recovery plan for the VELB was published by the USFWS in 1984 (USFWS 1984).

The VELB was recognized as a threatened species because of loss and alteration of its riparian habitat and because it naturally occurs at low population densities. This beetle is generally found along waterways and in floodplains that support remnant stands of riparian vegetation. In particular, elderberry must be present, as both larvae and adults feed on this shrub

or small tree. Larvae of the VELB feed internally on the pith of the trunk and larger branches, while adult beetles feed externally on elderberry flowers and foliage. Prior to metamorphosing into the adult life stage, VELB larvae chew an emergence or exit hole in the roots or trunk of the elderberry, through which the adult beetle later exits the plant. The VELB's exit hole is about the diameter of a standard wooden pencil and somewhat oval in shape. Often there is some swelling on the trunk where the exit hole is found. Exit holes in the lower trunk of elderberries are characteristic of past VELB infestations. Several studies (cited in USFWS 1984 and Barr 1991) have found that exit holes generally occur between ground level and about six feet in height. Similar appearing holes in the upper trunk and branches may be due to other wood-feeding insects.

Exit holes remain in the trunks of the elderberries even after the VELB has ceased to use a particular elderberry. For this reason, the exit hole can be used as an indicator of past infestation. Most exit holes that are observed on elderberries are older and difficult to date. However, recent holes can be readily distinguished based on the presence of larval frass or a pupal case of the VELB, fresh wood shavings, and non-oxidized wood. Unfortunately, these signs usually disappear within a few weeks after a VELB leaves the elderberry. As such, recent exit holes are detected rather infrequently. Several other types of insects make holes on elderberries and live in the stems. Others live in the tunnels created by the VELB larvae. These insects and insect-feeding birds often enlarge or modify older VELB exit holes to feed on these secondary insect inhabitants in the VELB tunnels.

Surveys conducted subsequent to the beetle's recognition as a threatened species have demonstrated that the VELB is more widespread than originally believed. Observations of exit holes and limited numbers of adults led the USFWS to believe that the beetle's geographic range included virtually all of the Central Valley and some surrounding foothill areas. This and various conservation efforts recently led the USFWS (2012) to propose delisting of the VELB. However, a scientific review panel (Atkins North America 2013) found that the USFWS was not aware of previously publishing findings by Chemsak (2005), which restricted the VELB's geographic range to only the Sacramento Valley and northern San Joaquin Valley. Adults observed in the southern San Joaquin Valley exhibited the phenotype of the non-threatened, nominate subspecies, *Desmocerus californicus californicus* rather than the VELB. This conclusion is further supported by specimens cited in Halstead and Oldham (2000). For these reasons, the peer reviewers concluded that the best available scientific data indicates that the VELB's geographic range is restricted to the Sacramento Valley and northern San Joaquin Valley and the perceived threats identified in the proposed rule to the listed beetle may actually be greater than portrayed by USFWS (2012). However, until USFWS publishes a final rulemaking it will undoubtedly consider the geographic range of the VELB to still include the southern San Joaquin Valley.

SURVEY METHODS

The McKay Point site was visited on April 9 and 10, 2014 to inventory the resident elderberry plants. This inventory was conducted in accordance with the Conservation Guidelines for Valley Elderberry Longhorn beetle (USFWS 1999). Based on this document, USFWS considers elderberries with a basal trunk diameter equal to or greater than (≥) 1.0 inch to be habitat for the VELB.

All portions of the McKay Point project site were inspected to determine the presence or absence of any elderberry plants. As individual elderberry plants were observed, positional coordinates were obtained using a mapping grade GPS unit manufactured by Trimble. My assistant and I inventoried the elderberries that would directly and indirectly (within 100 ft. of the reservoir's border) impacted by the project, per the aforementioned Conservation Guidelines for the VELB (USFWS 1999). The data dictionaries in our GPS units were programmed to record the following information for each elderberry plant location:

a) total number of elderberry plants;

b) number of trunks present for each of three basal diameter size categories;

c) presence of verifiable *Desmocerus* exit holes; and

d) whether or not the elderberry plant(s) grew in riparian habitat.

The McKay Point site was revisited on April 29, 2014 to search for adult beetles. Visual surveys were conducted in the mixed oak-riparian woodland portions of the site.

SURVEY RESULTS

As illustrated in Figure 3, plant communities at the McKay Point site include mixed oak-riparian woodland, elderberry savannah-riparian woodland, and non-native annual grassland. All three habitats are grazed by cattle, which can roam freely among the five parcels.

A total of 191 elderberry plants (Figure 4) were inventoried. Characteristics of the resident elderberries growing at these locations are summarized in Table 1. The vast majority of the elderberries, 176, grow in the two riparian plant communities, while only 15 were observed in the annual grassland. Within the footprint of the proposed reservoir, 140 elderberries were noted, while 51 were found growing within 100 ft. of the perimeter of the reservoir. A few of the elderberries within this 100-ft. buffer actually grow off-site on neighboring property (Figure 4).

Most of the elderberries growing at the project site are mature plants. Living stems less than one inch in basal diameter were uncommon as cattle were observed eating them during our inventory. A total of 143 stems exhibited basal diameters between 1 and 3 inches, 151 stems were between 3 and 5 inches, and 298 stems were greater than 5 inches (Table 1). Only a few plants exhibited solitary trunks, while the vast majority was characterized by multi-stemmed trunks. Bona fide exit holes of *Desmocerus* were observed on 13 (6.8%) elderberry plants.

No *Desmocerus* beetles were observed during our field work for the elderberry inventory. During my return visit on April 29th two males resembling the phenotype of the non-threatened *Desmocerus californicus californicus* were observed on elderberry plants growing in the mixed oak-riparian woodland located in the southeastern portion of the site. Unfortunately my recovery permit from USFWS does not allow me to collect living individuals as voucher specimens. Since both males were alive, neither was preserved as a voucher specimen.

ELDERBERRY MITIGATION ANALYSIS AND PLAN

The mitigation analysis and plan described in this section assumes that the beetle at the project site for the proposed McKay Pt. reservoir is the threatened VELB. However, as noted earlier, existing published information indicates that beetle in the greater Visalia area should be the non-threatened, nominate subspecies (*Desmocerus californicus californicus*). Also, two males observed there exhibited the phenotype of the nominate subspecies. If the USFWS adjusts the geographic range of the VELB in its final ruling to match information provided by Chemsak (2005) and Halstead and Oldham (2000), the reservoir project site would no longer be considered within the range of the VELB. Thus, none of the mitigation described herein would be necessary to satisfy any take of the threatened beetle under the Endangered Species Act.

Mitigation Analysis.

The data collected during this elderberry inventory was used to prepare a mitigation analysis in accordance with the USFWS's (1999) VELB conservation guidelines. Because the full extent of potential impacts due to the proposed reservoir project cannot be identified at this time, my mitigation analysis assumes that **all** elderberry plants growing within the footprint of the proposed reservoir and within 100 feet from the perimeter of the reservoir will be lost or otherwise affected. If project planning can avoid one or more of the elderberry plants, then the mitigation may be reduced accordingly.

In some instances, USFWS will allow work activities to occur as close as 20 feet from the dripline of elderberry plants, but this must be approved by USFWS after a review of descriptions of work procedures near the elderberries, access routes, laydown areas, equipment storage areas, and parking areas, plus the project's work schedule. Unfortunately, this information was not available at the time when this inventory was conducted. General protective measures are discussed in the next section of this report. If the protective measures are followed and USFWS approves, the mitigation requirements for this project could be substantially reduced from the scenario presented in this report.

The elderberry inventory information is used to:

a) identify the number of existing elderberries that will be transplanted to a secure mitigation site;

b) calculate the numbers of replacement elderberry seedlings that need to be propagated and planted at the mitigation site;

c) calculate the numbers of associated native trees and shrubs that need to be propagated and planted at the mitigation site; and

d) calculate the amount of acreage that needs to be secured to mitigate for the loss of VELB habitat.

The following points from the USFWS's (1999) VELB conservation guidelines were

considered in the mitigation analysis:

a) each trunk with a basal diameter $\geq$ 1.0 inch that is directly or indirectly impacted should be transplanted;

b) each stem with a basal diameter of 1.0 inch or greater that is impacted will be replaced with seedling elderberry plants using a replacement ratio of 1:1 to 8:1, and this ratio depends upon the type of habitat, sizes of basal stem diameters of affected elderberries, and the presence of VELB exit holes in the affected plants;

c) representative native tree and shrub species that grow in association with the elderberries will be planted at a ratio of one or two specimens for every replacement elderberry seedling (1:1 or 2:1 ratios);

d) 1800 square feet should be provided for every five replacement elderberry seedlings, five associated natives, and transplant; and

e) a mitigation site, which will serve as habitat for the VELB in perpetuity, must be secured for the transplants and replacement plantings, and the size of the site is determined by the total planting square footage required for all replacement elderberries and associated natives.

Using this inventory information, Table 1 presents the anticipated mitigation requirements for potential impacts to elderberries. The number of replacement plants necessary to compensate for the anticipated loss of 592 stems $\geq$ 1 inch is 2,087 elderberries and 664 associated native plants. The 191 resident elderberry plants with basal stem diameters > 1 inch must also be transplanted to the secure mitigation site. The required mitigation acreage for these replacement plants is a minimum of 343,800 $ft.^2$ or approximately 7.9 acres. Due to the large differential between the number of required seedlings for elderberry and associated natives, I suggest planting 11 elderberry seedlings with every transplant.

Depending upon the location of and characteristics of the mitigation site, various associated native trees and shrubs would be appropriate to plant in conjunction with the replacement elderberries to restore the riparian habitat. For example, Box Elder, Cottonwood, Willow, Valley Oak, and California Rose, are some riparian tree and vine species that often grow in close association with the elderberry food plant of the VELB in the greater Visalia area.

In addition, the findings of the aforementioned analysis are converted to an equivalent number of VELB conservation credits. Project sponsors may decide to satisfy their mitigation requirements through the purchase of such credits from a conservation bank approved by the USFWS to sell VELB conservation credits. This project will require 417 VELB conservation credits.

Mitigation Plan.

Assuming that all of the 191 aforementioned elderberries at the project site will be impacted by construction of the new reservoir, two alternatives are available to the project

sponsors to resolve their VELB mitigation requirements, including:

a) secure a mitigation site, protect it in perpetuity, revegetate it with the required numbers of elderberries and associated natives, and monitor it annually for a minimum period of 10 years to demonstrate that the habitat restoration is successful;

or

b) purchase VELB conservation credits at a USFWS-approved conservation bank whose service territory includes the project site.

The remainder of this section discusses each of these mitigation options in more detail.

Option #1 – Mitigation Site and Habitat Restoration: Under this option, the project sponsors would secure a mitigation site, protect it in perpetuity, revegetate it with the required numbers of elderberries and associated natives, and monitor it annually for a minimum period of 10 years to demonstrate that the habitat restoration effort is successful (i.e., at least 60 % survival of mitigation plantings at the end of 10 years). Specific features of this option for anticipated impacts to elderberries are detailed as follows:

a) at least 2,087 elderberry seedlings will need to be propagated and planted at a secure mitigation site;

b) at least 664 associated natives will need to be propagated and planted at a secure mitigation site;

c) 191 elderberry plants with stems $\geq$ 1 inch basal diameter that grow at the project site will be transplanted to a secure mitigation site; and

d) the mitigation site will need to include a minimum of 7.9 acres to insure adequate planting space for all of the mitigation plants.

The USFWS (1999) VELB conservation guidelines discuss additional measures that should be followed, including acceptable planting design standards, success criteria, monitoring, other implementation activities, and reporting requirements. Depending upon the location and characteristics of the mitigation site, the USFWS may provide additional recommendations for the habitat restoration effort.

This option may be the most expensive and lengthy of the two alternative mitigation solutions available to the project sponsors for the following reasons. First, a suitable mitigation site may need to be purchased if the sponsor does not currently own a site appropriate for restoration of VELB habitat. Because a property suitable for mitigation and measuring exactly 7.9 acres may not be available, the project sponsors may need to purchase a larger site to obtain the required acreage. Secondly, depending upon the condition of the mitigation site, the costs of site preparation, habitat restoration, and security may be considerable. Finally, annual monitoring and reporting to USFWS is required for a minimum of 10 years, or until all criteria

for successful restoration is actually achieved.

Option #2 – Purchase VELB Conservation Credits: For anticipated impacts at the reservoir project site, the project sponsor could purchase 417 VELB conservation credits (also referred to as "habitat units") from a USFWS-approved conservation bank whose service territory includes the project site. The 417 conservation credits are determined by dividing the total number of required mitigation elderberries by 5 (i.e., 2,087/5), which yields 417. No additional credits are needed for the associated native plants. Also, the 191 elderberries at the reservoir project site, whose basal stem diameters are > 1 inch, should also be transplanted to the conservation bank.

The service territory of at least one USFWS-approved conservation bank, the French Camp Conservation Bank, includes the McKay Point project site. Contact Mr. Darryl Foreman, Strata Habitat Foundation, 578 Riviera Circle, Larkspur, CA 94939, (415) 309-0646, for information about the availability of and fees for VELB credits. Transplanting of impacted elderberries may be an extra cost that will be estimated by the bank operator after visiting the project site. The USFWS (1999) VELB conservation guidelines provide information about the best time to transplant elderberries and recommended procedures for preparing the elderberries for transplant. These guidelines recommend transplanting the elderberries when they are dormant, usually between mid-November through mid-February. If transplanting occurs outside of this period, then the USFWS may impose higher mitigation ratios for elderberries and associated natives.

Advantages of this option are that the conservation bank assumes all responsibilities and liabilities for insuring that the required VELB mitigation is successful. Thus, once the project sponsor completes its purchase of the VELB credits, it will have fulfilled its mitigation obligation for the project.

PROTECTIVE MEASURES DURING AND AFTER CONSTRUCTION

If any elderberry plants remain at the reservoir project site during grading and construction activities, the following protective measures are recommended by USFWS (1999).

a) A buffer zone will be established around the perimeter of all elderberry plants that provide potential habitat for the VELB (i.e., $\geq$ 1 inch basal stem diameter). Preferably, the buffer zone should be at least 100 ft. wide and cannot include firebreaks, access routes, equipment storage areas, parking areas, or laydown areas. The perimeter of the buffer zone should be fenced during grading and construction activities.

b) All construction personnel will be briefed on the need to avoid damage to elderberries, as well as the penalties for non-compliance.

c) Warning signs will be erected every 50 feet along the edge of the buffer perimeter. The signs should state: "This area is habitat for the Valley Elderberry Longhorn Beetle, a threatened species, and must not be disturbed. This species is protected by

the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

d) All construction personnel will receive training on the status of the VELB and the need to protect its elderberry food plant.

In some instances the USFWS may reduce the buffer width to 20 feet around the dripline of elderberries. Additional protective measures are required and must be approved by USFWS, but may include precautions such as:

a) avoid work during the adult flight period of the VELB, which is generally between March 1st and June 30th;

b) conduct earthwork and other dust generating activities during the dormant period of the elderberry, i.e., mid-November through mid-February;

c) implement stringent measures for dust control;

d) no use of insecticides or herbicides at the project site; and

e) increased frequency of biological monitoring, for example once per week, to insure that the elderberries are adequately protected during the work.

USFWS may also request other protective measures after reviewing the project.

Indirect impacts to the elderberry plants, such as the accumulation of dust on foliage and flowers of the elderberry, can also adversely affect the VELB. Thus appropriate dust control measures should be followed throughout the grading and construction periods. Dust may also be generated by vehicular and equipment operation along temporary roads. Appropriate dust control measures include:

a) sprinkle water on all active construction areas at least twice daily and more often when conditions warrant;

b) cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard;

c) pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking, areas, and staging areas at construction sites;

d) sweep streets daily if visible soil material is carried onto adjacent public streets;

e) hydroseed or apply non-toxic soil stabilizers to inactive construction areas;

f) enclose, cover, water twice daily, or apply non-toxic soil binders to exposed soil

stockpiles;

g) limit traffic speed on unpaved roads to 5 mph;

h) replant vegetation in disturbed areas as quickly as possible;

i) suspend grading activities when winds exceed 25 mph or when visible dust clouds cannot be prevented from extending beyond active construction area; and

j) limit the areas subject to excavation, grading, and other dust generating activities at any one time.

Similarly, appropriate erosion control measures should be implemented to prevent any damage to the elderberries. The particular erosion control measures that may be needed should be recommended by a soils engineer.

Finally, if any elderberry plants remain at these project sites after completion of these projects, they will need to be protected and monitored to insure that subsequent site maintenance or other activities do not adversely impact them. The USFWS (1999) VELB conservation guidelines discuss measures for restoration, maintenance, and protection of buffer areas in more detail. The requirements are generally similar to those for off-site mitigation areas. A written plan for the restoration, protection, and maintenance of buffer areas needs to be approved by USFWS.

OBTAINING THE INCIDENTAL TAKE PERMIT

As long as the USFWS includes the Visalia area within the geographic range of the VELB, this agency will require an incidental take permit to be acquired by a project proponent and mitigation to compensate for any potential impacts. Assuming that an incidental take permit is required, the project proponent may apply for an individual permit under Section 10(a) of the FESA, if no other federal permits are required for the project, or under Section 7 of this regulation if other federal permits are needed. For example, endangered species permits are frequently "piggybacked" on wetlands permits issued by the U.S. Army Corps of Engineers. In either case, mitigation requirements are generally the same.

CONCLUSIONS

Historical records of *Desmocerus californicus* from Tulare County based on adult beetles rather than exit holes are limited; however, all specimens have phenotypes resembling the non-threatened subspecies *californicus* rather than the threatened subspecies *dimorphus* (Barr 1991; Chemsak 2005; and Halstead and Olmstead 2000). During the field surveys described herein, two males resembling the non-threatened subspecies were observed at the McKay Point site. For these reasons, I conclude that the beetle present there is the non-threatened *Desmocerus californicus californicus* rather than the threatened VELB (*Desmocerus californicus dimorphus*).

At this time the USFWS is preparing its final rulemaking regarding its earlier proposed

delisting of the VELB. It was supposed to have been published within one year from the publication of the proposed delisting (fall of 2012), but is overdue. While it is possible that USFWS will follow through with its original plan to delist the VELB, another scenario is that USFWS will continue to recognize the VELB as a threatened or endangered species, but modify the beetle's geographic range to exclude the southern and central portions of the San Joaquin Valley. If either of these scenarios actually occurs, then the VELB mitigation measures described in this report should no longer be necessary for the McKay Point reservoir project since the project site would no longer occur within the VELB's geographic range. Since its final rulemaking is already overdue, USFWS should publish its findings in the near future.

REFERENCES CITED

Atkins North America. 2013. Peer review of the scientific findings in the proposed rulemaking to delist the Valley Elderberry Longhorn Beetle. Raleigh, NC. 84 pp.

Barr, C.B. 1991. The distribution, habitat, and status of the Valley Elderberry Longhorn beetle, *Desmocerus californicus dimorphus* Fisher (Insecta: Coleoptera: Cerambycidae). U.S. Fish & Wildlife Service. Sacramento, CA. 133 pp.

Chemsak, J.A. 2005. Illustrated revision of the Cerambycidae of North America. Vol. II, Lepturina. Wolfgarden Books. Chino, CA. 446 pp.

Halstead, J.A. and J.A. Oldham. 2000. New distribution records for the elderberry longhorn beetle, *Desmocerus californicus* Horn (Coleoptera: Cerambycidae). Pan-Pacific Entomologist 76:74-76.

U.S. Fish & Wildlife Service. 1980. Listing the Valley Elderberry Longhorn beetle as a threatened species with critical habitat. Federal Register 45:52803-52807.

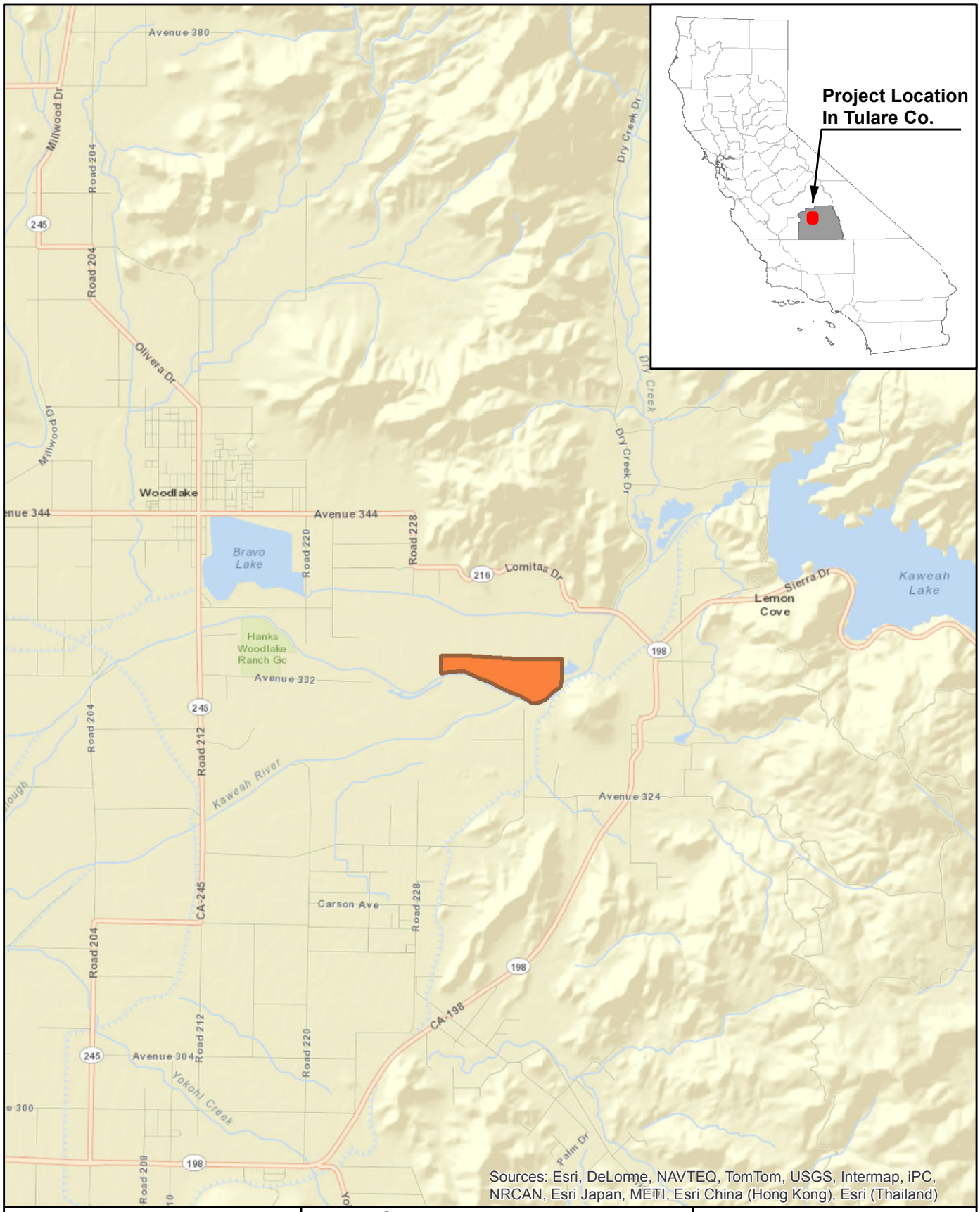
U.S. Fish & Wildlife Service. 1984. Valley Elderberry Longhorn Beetle recovery plan. Portland, OR. 62 pp. (written by Richard .A. Arnold).

U.S. Fish & Wildlife Service. 1999. Conservation guidelines for the Valley Elderberry Longhorn Beetle. Sacramento, CA. 13 pp.

U.S. Fish & Wildlife Service. 2012. Endangered and threatened wildlife and plants: removal of the Valley Elderberry Longhorn beetle from the federal list of endangered and threatened wildlife; proposed rule. Federal Register 77(191): 60238-60276.

Table 1. Elderberry Inventory and Mitigation Plant Requirements for the McKay Point Reservoir Project

Elderberry Location	Numbers of Elderberry Plants	Number of Plants with VELB Exit Holes	Number of Stems by Diameter Category			Numbers of Mitigation Plants	
			≥ 1" to ≤ 3"	> 3" to < 5"	≥ 5"	Elderberry	Assoc. Natives Plants
In Construction Area							
In riparian habitat	126	10	91	91	193	1,391	425
In non-riparian habitat	14	1	14	15	28	158	71
Within 100-ft. buffer							
In riparian habitat	50	2	32	42	74	517	156
In non-riparian habitat	1	0	6	3	3	21	12
Totals	**191**	**13**	**143**	**151**	**298**	**2,087**	**664**



0 0.5 1 Miles

EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

130 N. Garden Street
Visalia, CA 93291
(559) 636-1166

Legend

Project Site

McKay Point Reservoir

Tulare ID
Consolidated Peoples DC
Visalia & Kaweah WC

Figure 1 – Location Map

10/31/2013 : V:\Clients\Tulare ID-1248\124808C1-McKays Point Reservoir\GIS\Map\Revised\Location.mxd

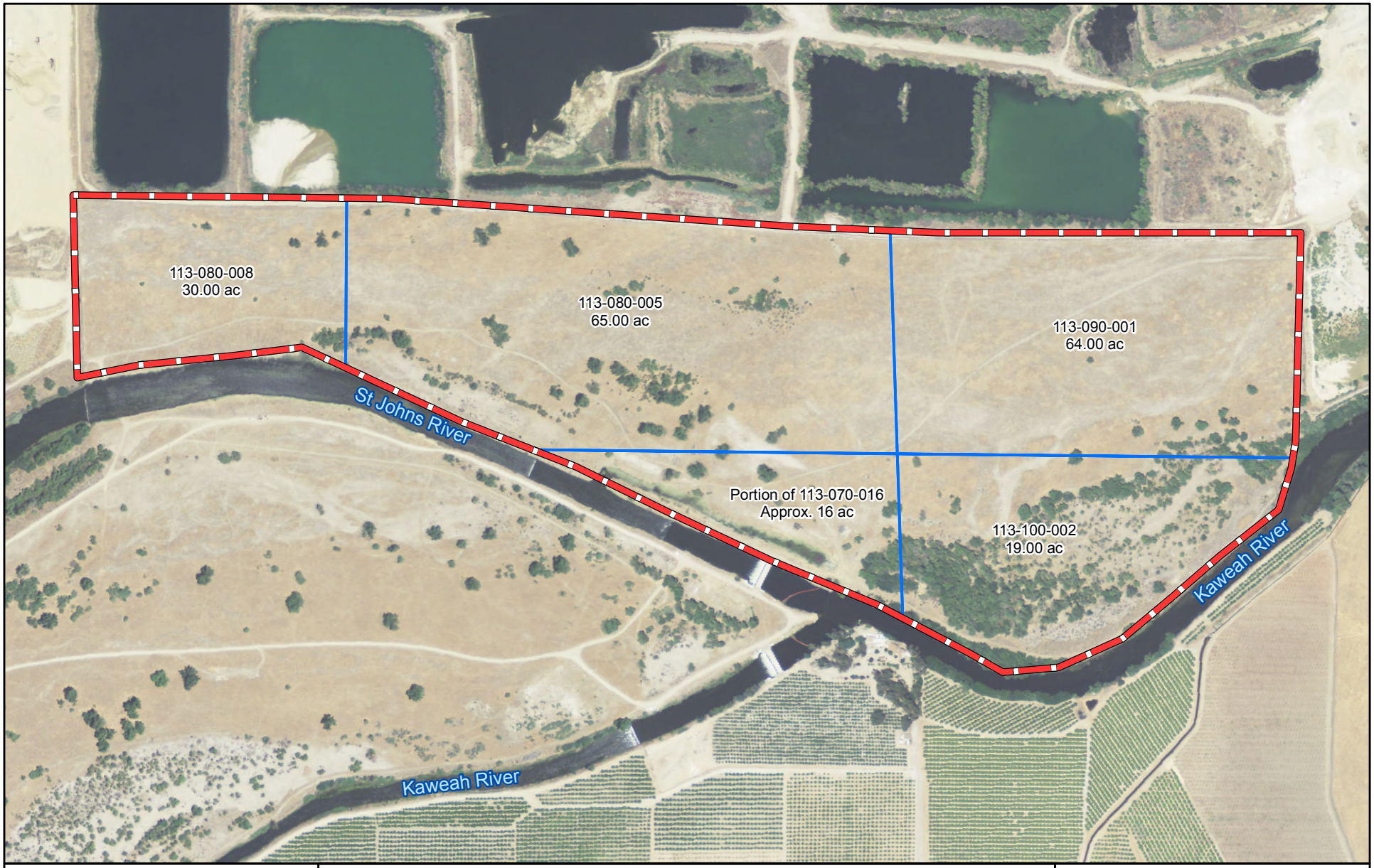


Figure 2. Five parcels for McKay Point Reservoir Project

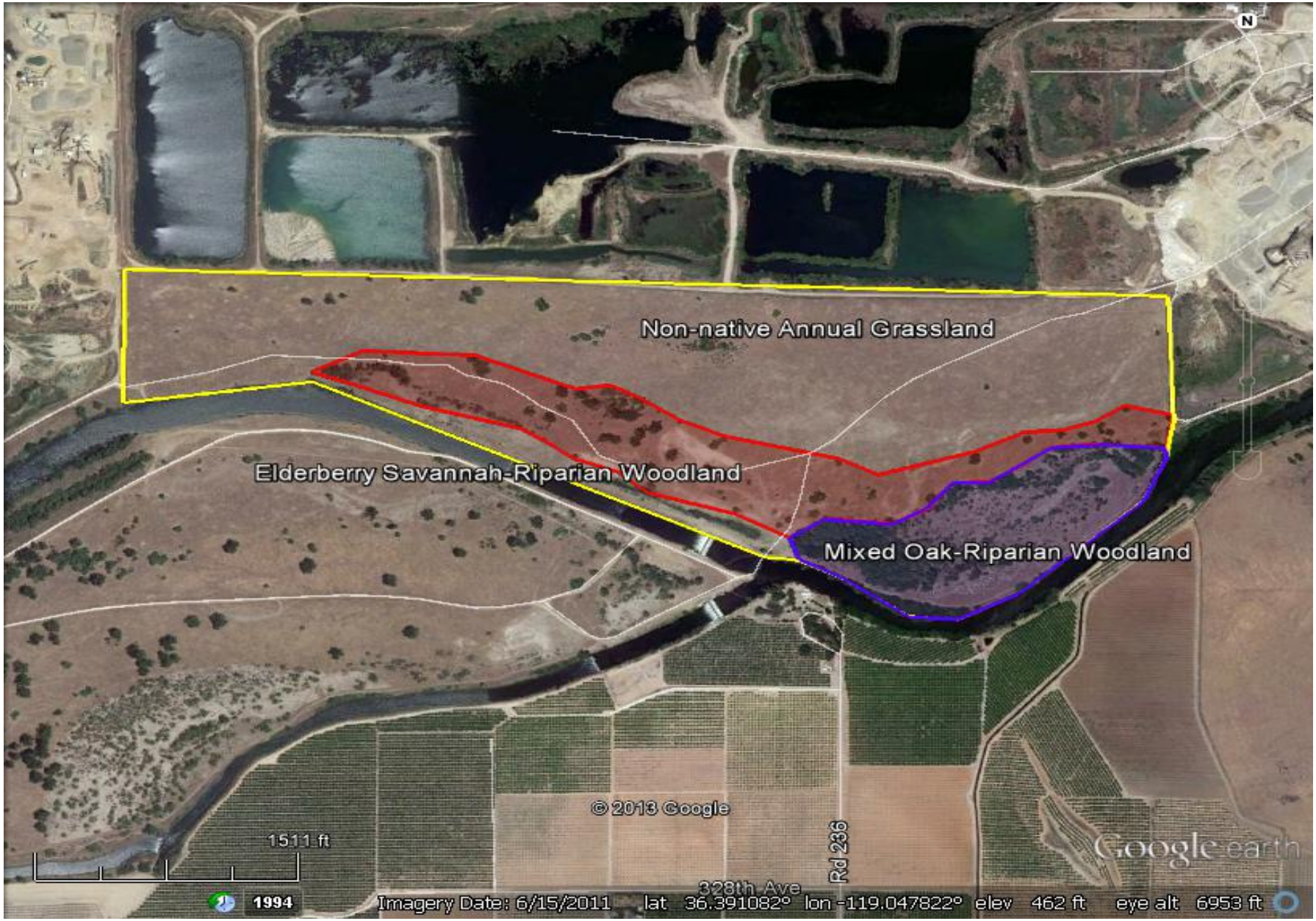
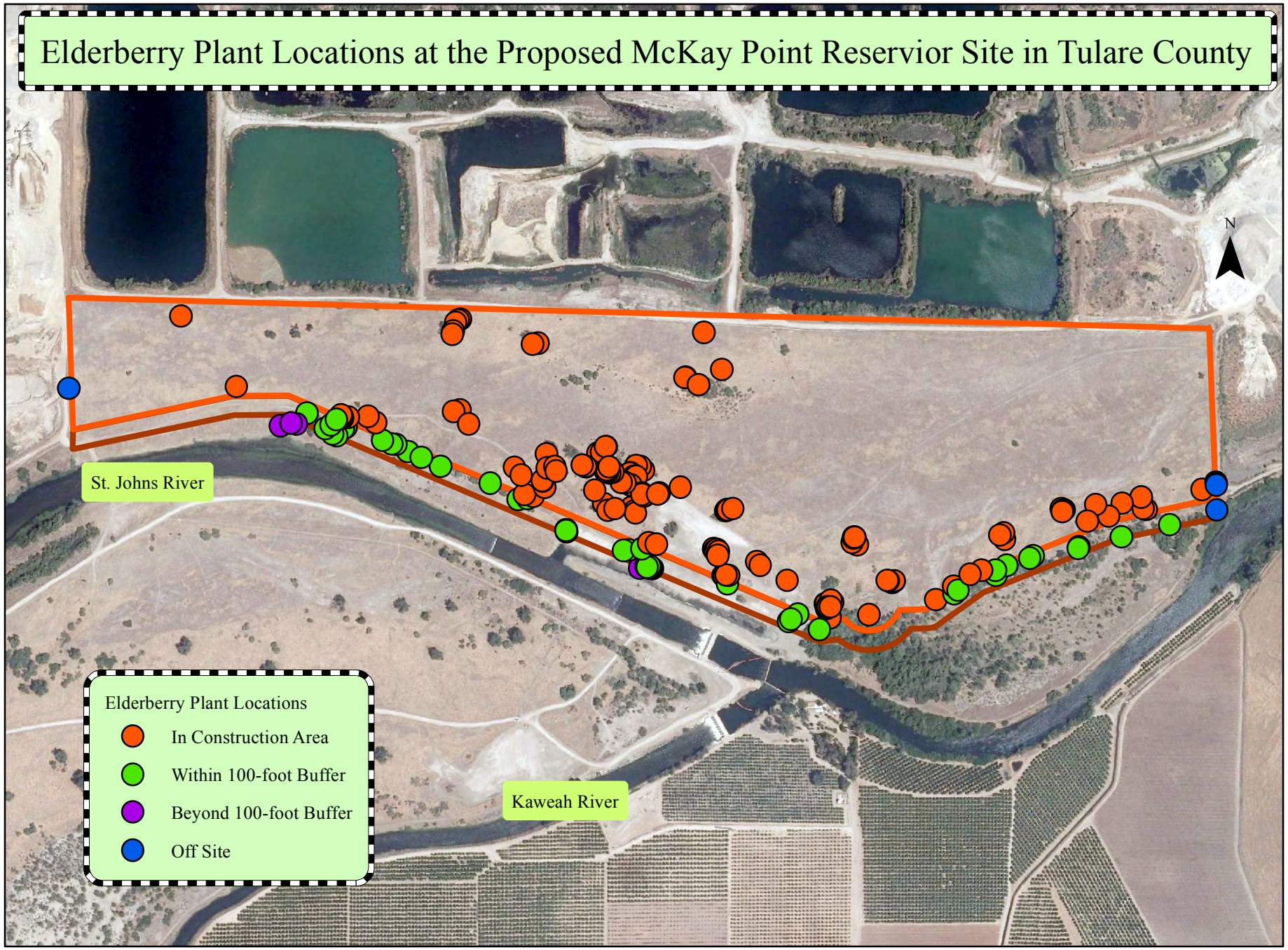


Figure 3. Vegetation map for McKay Point Reservoir project site.

Figure 4.


Elderberry Plant Locations at the Proposed McKay Point Reservior Site in Tulare County
N
St. Johns River
Kaweah River
Elderberry Plant Locations
In Construction Area
Within 100-foot Buffer
Beyond 100-foot Buffer
Off Site
0
0.25
0.5 Miles
Entomological Consulting Services, Ltd.
April 17, 2014

APPENDIX E

Cultural/Paleontological Resources

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APPENDIX E-1

Cultural Resources Investigation for the McKay Point Reservoir Project
(Applied EarthWorks, Inc., 2021)

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Cultural Resource Investigation for the McKay Point Reservoir Project, Tulare County, California

Jessica Jones and Diana T. Dyste

Prepared By

Applied EarthWorks, Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711

Prepared For
Sespe Consulting, Inc.
468 Poli Street, Suite 2E
Ventura, CA 93001

January 2021

Woodlake 7.5-min. quad
194 acres
Findings: One historic isolate (P-54-005095); one isolated prehistoric artifact (P-54-005096)

CONFIDENTIAL — Not for Public Distribution

MANAGEMENT SUMMARY

Tulare Irrigation District (TID), on behalf of the Visalia Water Company, and the Consolidated Peoples Ditch Company are proposing to build the McKay Reservoir Project (Project), a reservoir and associated intake and outlet structures, on land adjacent to the Kaweah and St. Johns Rivers in Tulare County, California. As the Lead Agency, TID is subject to Tulare County's regulations under the California Environmental Quality Act (CEQA).

To meet CEQA requirements, Applied EarthWorks, Inc. (*Æ*), on behalf of TID, conducted a cultural resources investigation to determine whether cultural resources are present within the Project area. The study included records searches at the California Historical Resources Information System Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield to identify previously recorded sites and prior studies in the Project area, a search of the Native American Heritage Commission's (NAHC) Sacred Lands File,, and a pedestrian archaeological survey of the Project area. The initial SSJVIC records search of the Project area and the surrounding 0.5-mile radius indicated that the Project area had not been previously surveyed and no archaeological or historical sites had been previously identified in the Project area.

As a result of the survey, *Æ* identified and recorded one historic-era isolate (P-54-005095/ AE-2193-2) and one prehistoric isolate (P-54-005096/AE-2193-3). P-54-005095 is a scatter of wood and metal that appears to be the remains of a historic wagon in the northwestern corner of the Project area. P-54-005096 is a basalt flake that lies outside of areas to be disturbed by the Project, as currently designed. Isolates lack association with other artifacts or features and cannot typically be associated with specific individuals or historic events. The ability of isolates to provide data regarding prehistory or history is limited and typically exhausted by the process of recording. Therefore, neither of the isolates is considered eligible for the California Register of Historical Resources.

Because of the high sensitivity of the Project area to contain buried archaeological deposits, *Æ* recommends limited subsurface testing in the immediate area of P-54-005096 and geoarchaeological analysis of the Project area to more fully understand the potential for Project ground-disturbing activities to cause adverse impacts to buried cultural resources. *Æ* advises that in the event archaeological remains are encountered during Project development or ground-moving activities in any portion of the Project, all work in the vicinity of the find should be halted until a qualified archaeologist can identify the discovery and assess its significance.

If human remains are uncovered during construction, the Tulare County Coroner is to be notified to arrange their proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 requires that the County Coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend means for treatment of the human remains following protocols in California Public Resources Code 5097.98. A copy of the final version of

this report will be placed on file at the SSJVIC. Field notes and photographs are on file at *Æ*'s office in Fresno, California.

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1
INTRODUCTION AND PROJECT DESCRIPTION

The Tulare Irrigation District (TID), on behalf of the Visalia Water Company, and the Consolidated Peoples Ditch Company are proposing to build the McKay Point Reservoir Project (Project), a water storage/reregulation facility in Tulare County, California (Figures 1-1 and 1-2). The Project lies in Township 18 South, Range 27 East, Sections 3 and 4 as shown on the U.S. Geological Survey (USGS) Woodlake 7.5-minute topographic quadrangle (Figure 1-3). The Project footprint occupies approximately 194 acres on the north side of the St. Johns River where it diverges from the Kaweah River at McKay Point.



Figure 1-1 Project area from the northeastern corner; view to the west-southwest.

The Project would require discretionary approvals and is therefore subject to the California Environmental Quality Act (CEQA). The TID is the Project applicant and the CEQA Lead Agency. The TID proposes the excavation, construction, and maintenance and operation of the McKay Point Reservoir (Project) on behalf of the Visalia and Kaweah Water Company and the Consolidated Peoples Ditch Company (Owners). The reservoir would provide surface water storage and reregulation to optimize groundwater recharge within the Owners' service areas. The Project area consists of 194 acres within the McKay Point property, including excavation of a 110-acre pit extending 60 feet below the ground surface (Figure 1-4). West Coast Sand and Gravel would be contracted to complete excavation of overburden and transform the aggregate

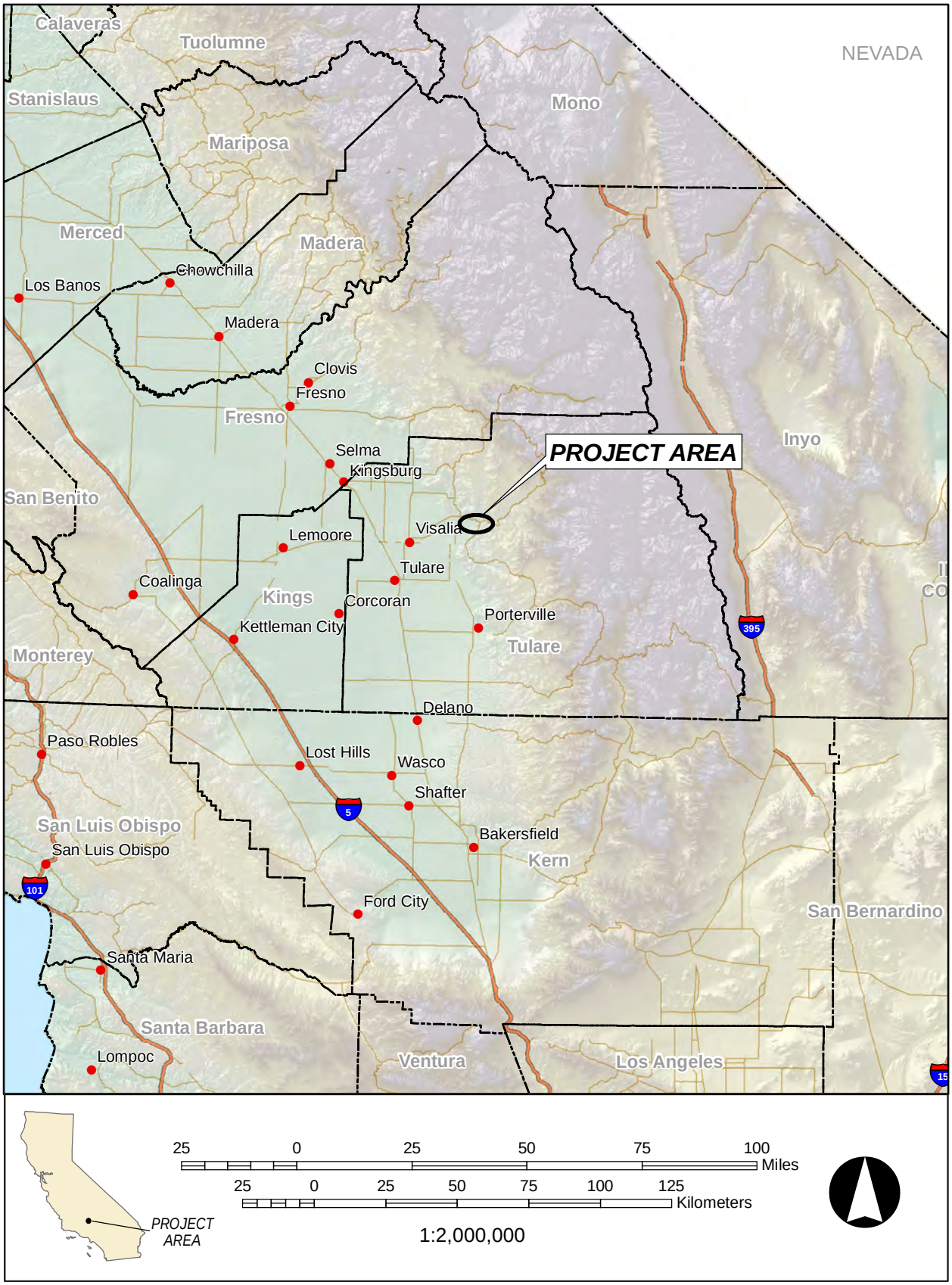


Figure 1-2 Project area in Tulare County.

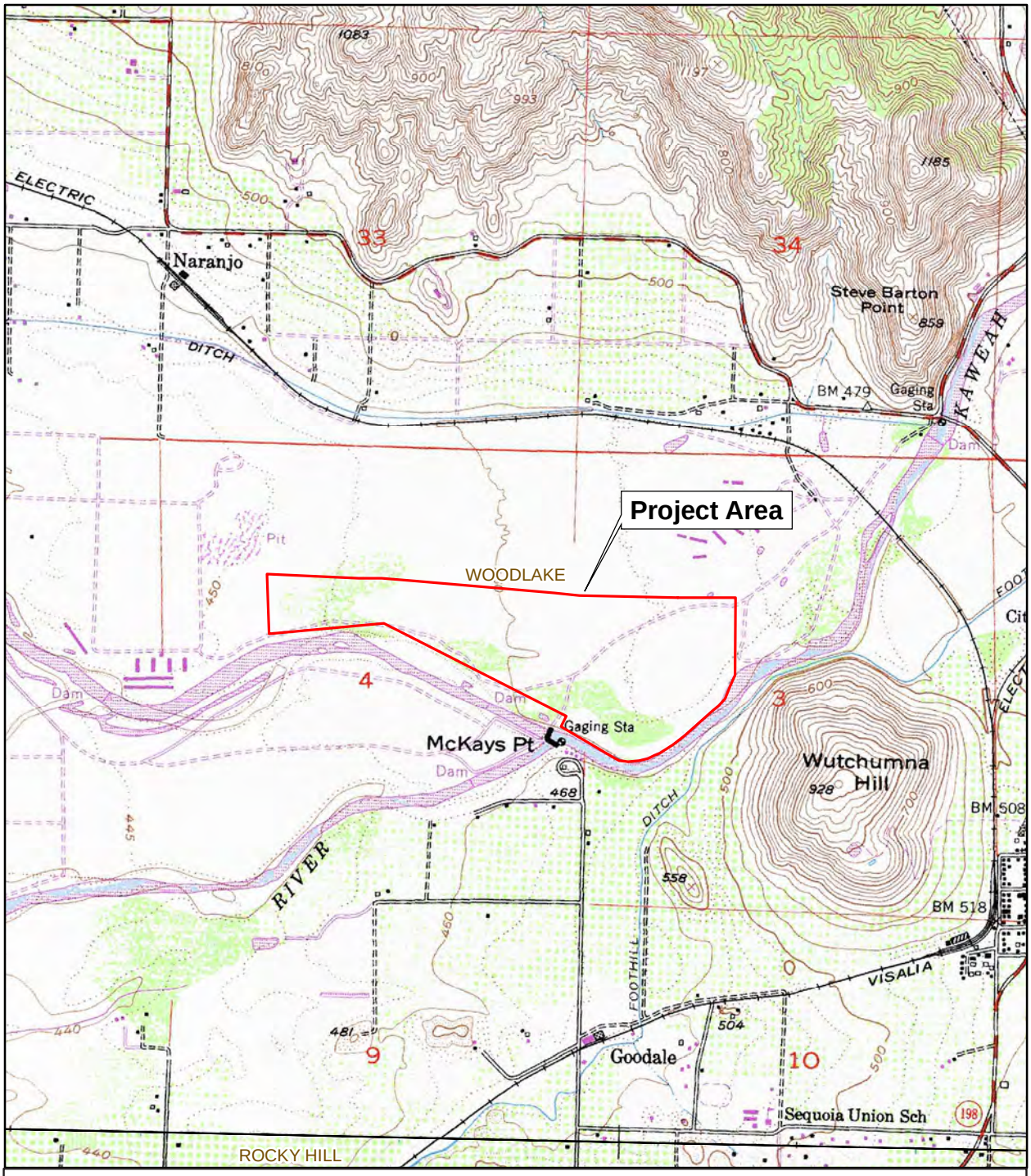


Figure 1-3 Project location on U.S. Geological Survey Woodlake 7.5-minute quadrangle.

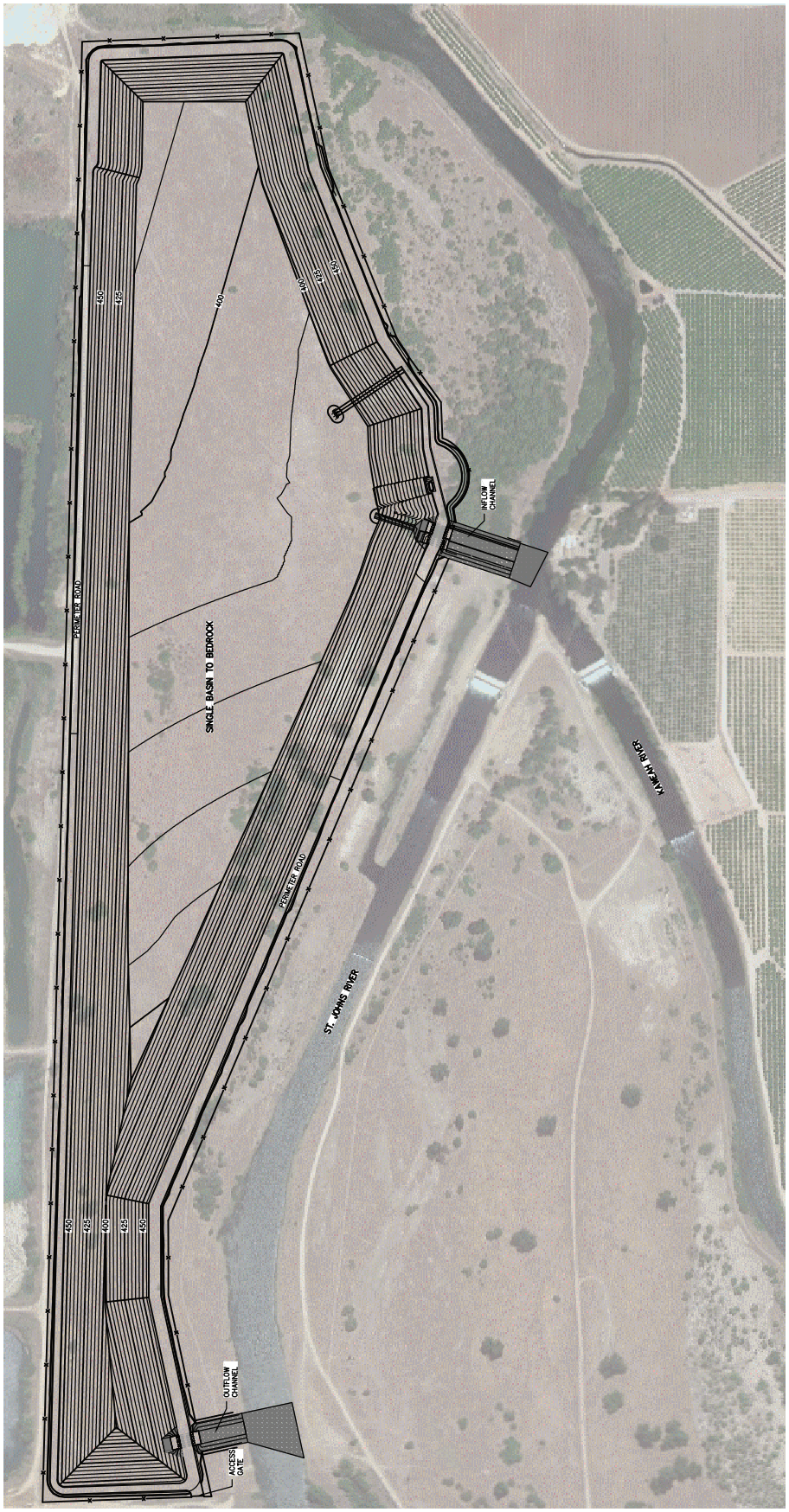


Figure 1-4 Proposed Project footprint.

into saleable material offsite. Other construction elements include inflow and outflow channels with reinforced concrete base and riprap, a flow/level control gate, an infiltration gallery made up of on-site ditches, a peripheral fence with access road, an entrance gate, and a generator building. The Project also includes a habitat area adjacent to the reservoir. This area will be preserved and not subjected to any ground-disturbing activity (Figure 1-4).

Tulare County will serve as Lead Agency under the California Surface Mining and Reclamation Act (SMARA) and, as such, the Project will be required to obtain County approval of a Surface Mining Permit for a SMARA-compliant Reclamation Plan and Financial Assurance Cost Estimate. TID is the Lead Agency for purposes of compliance with the CEQA, which mandates that public agencies consider whether their actions will have a significant impact on important cultural resources. Under CEQA, cultural resources require consideration if they are listed in or are eligible for listing in the California Register of Historical Resources (CRHR). A significant impact occurs if the project alters the qualities or properties of the resource that make it eligible for listing on the CRHR, although it should be noted that not all impacts are significant or adverse.

Under contract to Sespe Consulting, Inc. (Sespe), Applied EarthWorks, Inc. (Æ) performed a cultural resources investigation for the Project. The investigation included: (1) records searches, (2) Native American outreach, (3) a pedestrian archaeological surface survey completed in 2013 (Armstrong and Lloyd 2014), and (4) preparation of this technical report. The cultural resources work documented in this report was carried out in accordance with state regulations and standards, and the report has been prepared in accordance with the California Office of Historic Preservation (1990) standards outlined in *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format*. Æ also has performed paleontological studies of the Project area, which are reported under separate cover (Clifford and DeBusk 2014; Macias 2021).

Æ Senior Archaeologists Jay Lloyd (M.A.), a Registered Professional Archaeologist (RPA) and D. Gail Bellenger (M.A., RPA), provided technical and administrative oversight for all aspects of the Project. Æ Principal Archaeologist Diana T. Dyste (M.A., RPA) contributed to the report and served as technical editor. Associate Archaeologist Matthew Armstrong (M.A., RPA) requested the records search, conducted Native American outreach, supervised the pedestrian survey, and prepared the technical report. Jessica Jones requested a supplementary records search and updated this technical report. Æ GIS Technician Elizabeth Rapp (B.A.) assisted with the intensive pedestrian survey and prepared the Project maps. Résumés for supervisory personnel are provided in Appendix A.

2
SETTING

This chapter describes the environmental and cultural setting of the Project area to provide a context for understanding archaeological resources in the region. The nature and distribution of past human activities in the Central Valley have been affected by topography, climate change, water availability, and access to biological resources. Therefore, prior to discussing the cultural setting, aspects of the regional environment are briefly summarized below.

2.1 ENVIRONMENTAL SETTING

The Project area is in the San Joaquin Valley, the southern half of an elongated trough called the Central Valley. The Central Valley is a 50-mile-wide lowland that extends approximately 500 miles from the Cascade Range to the Tehachapi Mountains (Norris and Webb 1990:412). The Central Valley is divided into two unequally sized lobes separated by the Stockton fault. The northern lobe is the Sacramento Valley, drained by the Sacramento River, whereas the southern lobe is the San Joaquin Valley, drained by the San Joaquin River. The southeastern end of the San Joaquin Valley contains the now dry Tulare–Buena Vista–Kern Lake basin.

The San Joaquin Valley is bound by the Sacramento/San Joaquin River Delta to the north, the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The San Joaquin Valley comprises two distinct hydrologic subbasins: the San Joaquin and the Tulare. The San Joaquin subbasin is drained by the San Joaquin River. The Tulare subbasin has no regular surface outlet; it was formed by the merging of alluvial fans from the Kings River to the east and Los Gatos Creek to the west (Cone 1911). The Tulare subbasin rivers—the Kings, Kaweah, Tule, and Kern—flowed into the subbasin, forming large inland lakes. Tulare Lake, approximately 30 miles southeast of the Project area, was an extremely shallow seasonal lake that expanded horizontally across the flat landscape as it filled with winter and spring runoff. Its broad yet shallow dimensions resulted in wide fluctuations of the lake's shoreline during both prehistoric and historical times. As it filled beyond its natural alluvial barriers, water was channeled down the Fresno Slough into the San Joaquin River. Tulare Lake was the largest naturally occurring lake in California as recently as 1920 (Norris and Webb 1990:433). The size of the lake was gradually reduced by the historical development of irrigation systems and the reclamation of water from the Kings River and other sources. Today, Tulare Lake only exists in times of flooding, and the deep reserve of groundwater is tapped for private and public use.

The Project area is located on the north side of the confluence of the St. Johns River and the Lower Kaweah River, near Woodlake in Tulare County. The Kaweah River flows from a canyon in the Sierra Nevada approximately 3 miles to the northeast. The Kaweah is one of a number of rivers (including the Kern, Tule, and Kings) that deposit low-gradient fans along the eastern San Joaquin Valley and drain the western slopes of the Sierra Nevada range. Elevations in the Project area range between 450 and 470 feet above mean sea level.

Several branch streams (including the St. Johns River) diverge from the Kaweah River soon after it exits the canyon at the head of a large low-gradient alluvial fan commonly referred to as the

Kaweah Delta. The river is now dammed, and water flow is highly regulated; however, many of the formerly natural channels are still evident. Additionally, sloughs, abandoned channels, and overflow channels further connect or distribute water across the lower portion of the alluvial fan. Between channels are large masses of recently vegetated alluvium, rapidly aggrading due to the cohesive nature of fine particles and root binding by vegetation (Waters 1992). This hydrological system has been highly modified by channelization and water control in the valley, and some drainages (including the St. Johns River) flow only seasonally if at all.

The development of agriculture within the Project area resulted in the replacement of native plants and animals with domesticated species. Common native plants today include white, blue, and live oaks (*Quercus* sp.) as well as walnut (*Juglans* sp.), cottonwood (*Populus aegiros*), willow (*Salix* sp.), and tule (*Schoenoplectus* sp.). Also prominent is bulrush (*Cyperus* sp.) and cattail (*Typha* sp.), various grasses, flowers, and saltbrush. The previously swampy valley floor once provided a lush habitat for a variety of animals including mule deer (*Odocoileus hemionus*), tule elk (*Cervus* sp.), pronghorn (*Antilocapra americana*), grizzly bear (*Ursus arctos californicus*), black bears (*Ursus americanus*), and mountain lions (*Puma concolor*) (Preston 1981:245–247). Mammals commonly noted today are the valley coyote (*C. latrans*), bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), and rabbits (Leporidae). Birds in the area include American osprey (*Pandion haliaetus* sp.), redwing blackbird (*Agelaius phoeniceus*), marsh hawk (*Circus cyaneus*), willow and Nuttall woodpeckers (Picidae), western meadowlark (*Sturnella neglecta*), and quail (Phasianidae). The lakes, rivers, and streams throughout the vicinity provided rich habitat for an assortment of freshwater fish species (Preston 1981:249).

2.2 CULTURAL SETTING

2.2.1 Prehistory

Relatively few research-oriented archaeological investigations have been conducted in the Central Valley south of the Stockton area, and synthesized information on prehistoric events in the area is sparse (Moratto 1984:189, 191–193, 512, 573; Rosenthal et al. 2007). Nonetheless, archaeological work performed within the Kaweah River drainage, and specifically a few miles to the east at Lake Kaweah (Meighan et al. 1988) provides valuable information germane to regional prehistory. Further information comes from excavations performed in the mountains and hills to the south and southeast (Dillon 1992; Meighan et al. 1988; Wallace et al. 1989).

The first large-scale excavations in the southern San Joaquin Valley were conducted near Tulare and Kern Lakes by Gifford and Schenck (1926), who unearthed flexed burials, pottery, obsidian arrow points, milling stones and mortars, and intricately fashioned steatite artifacts. In the late 1940s, Riddell (1951) investigated a Yokuts cemetery (CA-KER-74) near the town of Delano. The graves contained Euro-American items along with shell ornamentation, flaked stone tools, and steatite artifacts. Less than 10 years later, a team of archaeologists from University of California, Los Angeles, excavated CA-TUL-90, another burial site at the edge of former Tulare Lake approximately 29 miles west of the Project. By comparing their findings at CA-TUL-90 with those of earlier studies, Warren and McKusick (1959) constructed a chronological sequence of mortuary practices, which could then be used to infer the age(s) of sites containing interments.

Later archaeological investigations at Kern and Tulare lakes revealed that occupation occurred possibly as early as 11,000 years before present (B.P.) (Sampson 1991). The Witt Site (CA-KIN-32) on the southwest shore of Tulare Lake contains fluted projectile points as well as later types, suggesting continuous occupation of the basin from Paleoindian times until historical contact (Fenenga 1993; Moratto 1984:81–82).

Excavation of CA-KER-116, a prehistoric site at Buena Vista Lake, found a deeply-buried component ascribed to the Western Pluvial Lakes Tradition that dated from circa 11,500–7500 B.P. (Fredrickson and Grossman 1977; Grossman 1968; Moratto 1984). Population density was low at that time, with a few settlements focused around the shores of ancient lakes. Between 8000 and 4000 B.P., the prehistoric economy centered on hunting and fishing, although mortars and pestles as well as *Olivella* and *Haliotis* shell beads and ornaments appear in some assemblages (Sutton 1997). Although populations may have centered on the lakes, there is some evidence for use of the mountains of eastern Tulare County as early as 6000 B.P. by small, highly mobile parties who repeatedly visited specific resource procurement areas (Dillon 1992).

Beginning about 4000 B.P., the subsistence base expanded to include seed processing. Sites dating to this period contain assemblages comparable to the roughly coeval Early Horizon components of the Sacramento–San Joaquin Delta region (e.g., extended burials with grave goods, Pinto series projectile points, time-diagnostic *Haliotis* and *Olivella* beads as well as ornaments and charmstones) (Moratto 1984; Riddell 1951; Walker 1947; Wedel 1941). It is difficult to clearly determine the ancestry of these early peoples, although artifact assemblages associated with occupations postdating 3000 B.P. may be linked to the ancestors of the ethnographic Yokuts. The latest period of occupation, from 1500 B.P. to historic contact, indicates a greater reliance on acorns and other plant foods as well as trade with the Central Coast region and Southern California interior (Moratto 1984:183, 188).

Chronological data from research conducted within the Kaweah River drainage to the east of the Project area is limited as few radiocarbon dates, obsidian hydration measurements, or time-diagnostic artifacts have been collected or reported (Meighan et al. 1988:140, 270–273). Available data suggest that occupation of the Lake Kaweah area began around 2500 B.P., although it is likely that earlier occupations are simply unrecognized (Meighan et al. 1988:273).

The Kaweah River drainage generally, and the location currently covered by Lake Kaweah specifically, was well-populated in late prehistory. Some ethnohistoric period estimates place the population as high as 2,400 individuals. The area supported a large variety of site types, including villages, cemeteries, bedrock milling stations, hunting blinds and traps, and rock art. The settlement system appears to have centered on villages, occupied most or all of the year, from which small groups (likely families) would radiate out to gather resources at seasonal camps and special-use sites (e.g. hunting locations, acorn gathering spots, etc.) (Meighan et al. 1988).

The identity of the prehistoric occupants of the Lake Kaweah area is open to some interpretation. Several sites indicate cemetery burials in keeping with late prehistoric and ethnohistoric Yokuts traditions. However, other sites contain cremations and burials in house floors. This may indicate retention of earlier burial practices within the Lake Kaweah area, or it may indicate that the area was occupied by both Yokuts and Mono peoples. This latter hypothesis is further supported by local rock art, which appears to be more similar to known Mono styles than to that of the Yokuts.

Moreover, pottery, an innovation often attributed to the Mono, is relatively abundant in Lake Kaweah sites, while steatite vessels more common in the western Yokuts sites are rare (Meighan et al. 1988). While, the ethnographic record indicates that the region was populated by Yokuts people, the aggregate data seem to suggest that either the Yokuts population regularly interacted with and shared many traits of the neighboring Mono population, or that the area prehistorically was used by both groups.

2.2.2 Ethnography

The Project area is within the homeland of the Gáwea (or Kaweah) Yokuts (Kroeber 1976: 480; Latta 1999:187–188), one of the many autonomous tribes that make up the Southern Valley Yokuts ethnolinguistic group. At the time of first contact with the Spanish missionaries, the Yokuts people, including northern valley and foothill groups, collectively inhabited the San Joaquin Valley as well as the eastern foothills of the Sierra Nevada from the Calaveras River southward to the Kern River (Wallace 1978a, 1978b). The Yokuts language belongs to the broader Penutian family, which subsumes a relatively diverse assemblage of languages, including Miwok, Costanoan, Maiduan, and Wintuan (Silverstein 1978). Compared to other Penutian languages, however, Yokuts shows considerable internal linguistic homogeneity, especially given the extent of its geographic distribution. Dialects differ minimally and were mutually intelligible, at least among individuals from contiguous groups. This relative lack of linguistic differentiation suggests that ancestors of the Yokuts entered California after the arrival and subsequent radiation of the more linguistically diverse Penutian groups such as the Miwok and Costanoan (Moratto 1984:554).

The basic unit of Yokuts society was the nuclear family, which was identified with a totem symbol specific to the paternal line. Within each tribe, lineage totems were further grouped into one of two moieties, designated by the overarching symbols of the eagle and coyote (Wallace 1978b:453). The basic political unit was the tribe or tribelet, which encompassed a single village or several settlements (Kroeber 1976).

Tulare Lake and its tributary rivers, including the Kaweah and the St. Johns, were a central part of Southern Valley Yokuts subsistence, providing food, building material, and avenues of travel for small watercraft. Not surprisingly, most Yokuts villages were situated near major waterways or around Tulare Lake (Wallace 1978b:448). For example, the main Gáwea village, also known as *Gáwea*, was situated on the north side of the Kaweah River at the current location of Terminus Dam (Latta 1999:188). The rivers provided fish, waterfowl, and other game attracted to the fresh water. The tule stalk was used in the manufacture of mats, baskets, and other goods (Wallace 1978b:451).

Most flaked stone artifacts were fashioned from obsidian and other imported material (Wallace 1978b:452). Ground stone artifacts, inclusive of handstones and milling slabs/slicks as well as mortars and pestles, were manufactured of granitic and metavolcanics rock. Where suitable outcrops were available, milling slicks and bedrock mortars were manufactured on bedrock. Where bedrock was not available, portable mortars and slabs manufactured from large cobbles and small boulders were used.

At the broader interregional level, the villages of the Southern Valley Yokuts profited from the east-west trade of goods that flowed between the Pacific coast and the high Sierra and Great

Basin (Davis 1961). The Yokuts bartered their local staples (e.g., freshwater fish, acorns, and tule reeds) to obtain such goods as Olivella beads and other shell material from the west as well as obsidian from the east.

As with other Indian groups in California, the lifeways of the Yokuts were dramatically altered as a result of contact with Spanish explorers and missionaries, miners, ranchers, and other immigrants who entered the San Joaquin Valley after 1700. In 1856, the Tule River Indian Reservation was established for the Koyeti and Yaudanchi tribes. The reservation was moved from its original site just east of Porterville, designated as State Historical Landmark #388, to its present location in 1873 (Tule River Indian Tribe 2011). As late as 1926, adobe ruins from the original reservation were still present (Small 1926:469). The introduction of European culture and new diseases proved devastating to the native population. In the 1860s, smallpox decimated Indians living at the Cobble Lodge site (CA-TUL-145) near Lake Kaweah (Moratto 1984:331).

There are several Native American tribal groups with ancestral ties to the Project area, including the Santa Rosa Rancheria Tachi Yokut Tribe, Tule River Indian Tribe, and the Wuksache Indian Tribe/Eshom Valley Band. Several Southern Valley Yokuts tribes have survived the effects of colonization. Yokuts today have developed language apprenticeship programs and early childhood education centers to serve tribal members, including the Wukchumne of the Tule-Kaweah near Porterville, Choynimni speakers of the Kings River tribes, Chukchansi at the Picayune and Table Mountain rancherias near Fresno, and Yawelmani speakers of the Tule River Reservation (Golla 2011:154). Several Yokuts tribal groups are governed by elders' councils and operate auxiliary departments that serve local tribal populations in areas of healthcare, education, and cultural resource management.

2.2.3 History

Government expeditions to the Tulare Lake basin during the mid to late 1840s resulted in recommendations for the development of agricultural settlements that would permanently alter the area (Preston 1981:62). After discovery of gold at Coloma in 1848, speculators began entering the San Joaquin Valley. The miners' needs for food and supplies subsequently facilitated the development of ranching in the Tulare Lake basin (Preston 1981:72). New roads and trails emerged throughout the area, and the ranching industry boomed when access to livestock markets to the north and south became available.

In 1853, Tulare County, which at the time included most of present-day Kings County, was established with the budding town of Visalia as the county seat. By the 1870s many Southern Pacific Railroad towns had emerged, including Hanford (1877), Lemoore (1877), and Tulare (1872) (Preston 1981:125). The coming of the railroad was by no means a boon for all residents. Numerous pioneers had settled on and improved railroad land, mistakenly believing that they would pay the low per-acre price advertised by the railroad for unimproved land. Instead, when homesteaders attempted to gain title to their land, they were given asking prices exceeding $30 per acre for their now-improved properties. The disgruntled settlers filed suits against the railroad but were stone-walled by railroad-backed politicians. Frustration erupted into violence on May 11, 1880 when homesteaders exchanged gunfire with a U.S. marshal and railroad representatives near Hanford. The incident—known as the Mussel Slough Tragedy—provided fodder for antirailroad sentiment in the press and served as the inspiration for the Frank Norris novel, *The Octopus: A California Story* (see Baloian [2009] and Hanson [2006]).

The pace of economic development in Tulare County greatly accelerated with the construction of irrigation systems. Several irrigation companies formed in the early and mid-1870s, and after overcoming initial financial and physical difficulties, the Lower Kings River, People's, and Last Chance ditches, among others, were delivering water to farms by the end of the decade (Menefee and Dodge 1913). Tulare irrigation concerns tapped the ample Kings River, although some canals draw water from the Kaweah River and its branches.

Citrus fruit, now a major crop in Tulare County, was initially thought "too exotic" for the San Joaquin Valley. Lemons, specifically, were thought to be ill-suited to the valley climate, until they were planted by James William Center Pogue in 1868. Initially planting nearer the Kaweah River, the Pogue family moved their orchards to the community of Lime Kiln. In addition to serving as the home base for Pogue's growing citrus operation, Lime Kiln also became the base for a large operation organized by Pogue, J. B. Wallace, and C. W. Crocker. The three also built the Pogue Hotel to serve travelers. In 1894, Pogue subdivided the land in and around Lime Kiln and sold residential lots, renaming the town Lemon Cove (Kaweah Commonwealth n.d.).

By 1910 the development of new towns and settlements had slowed dramatically, and improvements were initiated to construct better roads. Agricultural concerns continued to prosper, resulting in the intensification of local farming until the 1930s, when individual farmers emerging from the Great Depression no longer found agriculture to be a lucrative endeavor. Since that time farmland has increasingly been developed for commercial interests.

Despite the general slowdown in the development of new towns, Woodlake was founded in 1912 by land developer Gilbert F. Stevenson as a planned community surrounded by citrus orchards. Initial growth was rapid, and by 1913 Woodlake contained two schools, retail stores, two churches, a bank, and a newspaper. Stevenson further ensured the growth of the community by paying half of the cost to install a bridge across the St. Johns River, donating right-of-way to the railroad companies to bring trains (including the Visalia Electric Railroad) to the town, and building levees around Wood Lake (now known as Bravo Lake) to ensure that it remained a permanent year-round water feature (City of Woodlake 2013).

Stevenson's fortunes suffered with the onset of the Great Depression. However, Woodlake continued to grow, with agriculture remaining its primary source of income. The City of Woodlake was incorporated in 1940, making it the seventh city in Tulare County (City of Woodlake 2013).

3
METHODS

3.1 RECORDS SEARCH

Æ requested records searches from the California Historical Resources Information System Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield in October 2013 and November 16, 2020. These searches encompassed all land within a 0.5-mile radius of the Project area. Sources consulted included archaeological site and survey base maps, reports of previous investigations, cultural resource records, the listings of the National Register of Historic Places, the Historic Property Data File (3/18/13), the California Historical Landmarks, the California Register of Historical Resources, the California Inventory of Historic Resources, the California Points of Historical Interest, and the Built Environment Resources Directory (Appendix B).

3.2 NATIVE AMERICAN OUTREACH

On September 30, 2013, Æ contacted the Native American Heritage Commission (NAHC) on behalf of TID to request a search of its Sacred Lands File to identify any Native American cultural resources recorded in the Project area. Æ also requested a list of individuals and groups with whom TID may consult regarding resources of sacred or special cultural and spiritual significance in the Project area. On October 2, 2013, Æ sent letters describing the Project and its location to the contacts identified by the NAHC (listed below).

- Neil Peyron, Chairperson, Tule River Indian Tribe;
- Lalo Franco, Cultural Coordinator, Santa Rosa Tachi Rancheria;
- Kenneth Woodrow, Chairperson of the Wuksache Indian Tribe/Eshom Valley Band;
- John Sartuche of the Wuksache Tribe;
- Jennifer Malone; and
- Kerri Vera, Environmental Department, and Joey Garfield, Tribal Archaeologist, Tule River Indian Tribe.

On October 14, 2013, Æ sent a follow-up e-mail or made a phone call to those contacts that had not yet responded. A contact log and copies of the Native American outreach documentation are included in Appendix C.

3.3 FIELD SURVEY

Æ archaeologists Matthew Armstrong and Elizabeth Rapp conducted a pedestrian survey of the Project area using 15–20-meter transects on October 7–11, 2013. The approximately 175-acre survey area encompassed the 168 acres proposed for the Project, including the reservoir locations and habitat area (Figure 3-1). Æ also surveyed the banks of the St. Johns River adjacent to the Project's southern boundary.

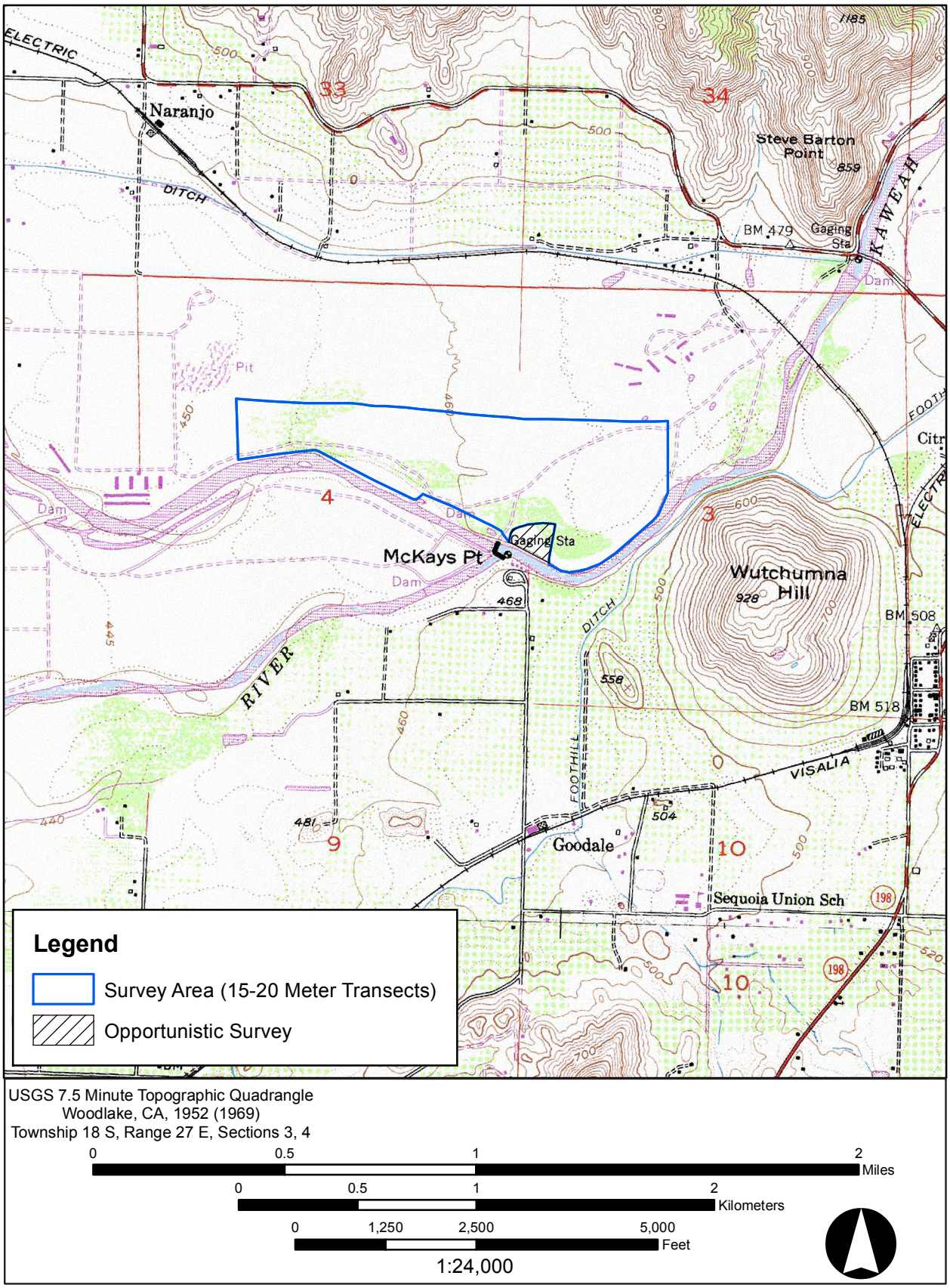


Figure 3-1 Cultural resources survey coverage.

When an artifact or feature was encountered that appeared to be of historic age (i.e., 45 years old or older), surveyors marked its position and closely examined the surrounding area for associated artifacts and/or features. Cultural resources identified within the Project area were mapped using a Trimble GeoXH hand-held Global Positioning System (GPS) and documented on California Department of Parks and Recreation (DPR) 523 series cultural resources inventory forms. Cultural resources and survey conditions were photographed using a Canon Powershot A810 digital camera. Methods and field observations were recorded on Æ Daily Work Record and Survey Field Record forms. All photographs and field notes are on file at Æ's Fresno office. Complete documentation of cultural resources, including confidential location maps, is included in Appendix D.

4
FINDINGS

4.1 RECORDS SEARCH AND BACKGROUND RESEARCH

Æ's first records search request was submitted to the SSJVIC on October 10, 2013, and results were returned on October 14, 2013 (RS# 13-403). Æ requested a supplementary records search to capture new resources or studies that have occurred in the Project vicinity since the 2013 investigations. The second records search was requested on November 16, 2020, and was returned on November 30, 2020. The results of both records searches are provided below. Until Æ's investigations in 2013 (TU-1668), no cultural resources studies had occurred within the Project area. Three cultural resource investigations have occurred within a 0.5-mile radius of the Project (Table 4-1), one of which (TU-01365) overlaps slightly with a portion of the survey area (see Section 3.3 for an explanation of the survey area versus the Project area).

Table 4-1
Previous Cultural Resources Studies within 0.5 Mile of the Project Area

SSJVIC Report No.	Report Author(s)	Report Date	Report Title
TU-01365	Pruett, Catherine	2009	A Cultural Resource Assessment for Approximately 30 Acres, Located Northeast of Visalia, Tulare County, California
TU-01394	Parr, Robert	2009	Cultural Resource Assessment for the Replacement of Eleven Deteriorated Power Poles on the Southern California Edison Company Bravo, Cairns, Campbell, Homer, Merryman, and Redbanks 12 kV Circuits, Tulare County, California
TU-01498	Leach-Palm, Laura; Brandy, Paul; King, Jay; Mikkelsen, Pat; Seil, Libby; Hartman, Lindsay; and Bradeen, Jill	2010	Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties

Until 2013, no resources had been recorded within the Project area, but five resources were identified within 0.5 miles of the Project area (Table 4-2): four historic-era resources (P-54-004034, -004587, -004615, and -004676) and one prehistoric habitation site located across the Kaweah River (P-54-000316). P-54-004676 was mistakenly mapped by the SSJVIC within the Project area, but a review of the site record found that it is on the St. Johns River, just outside both the Project area and the survey area. The site record describes P-54-000316 as a "village site" but provides no information regarding the site constituents. Documentation of the records searches is included in Appendix B.

Table 4-2
Previously Recorded Resources Within 0.5 Mile of the Project Area

Primary No.	Date Recorded	Prehistoric/ Historic	Description
P-54-004676	2008	Historic	Historic-era diversion dam (built in 1938)
P-54-004587	2008	Historic	Historic-era recreation area
P-54-000316	Unknown	Prehistoric	Probable habitation site
P-54-004034	2001	Historic	Historic-era electric railroad (built in 1905)
P-54-004615	1999	Historic	Historic-era ditch (built in 1878)

Æ also examined the historic USGS topographic maps of the Project area. The 1928 Lemon Cove and 1952 Woodlake 7.5-minute quadrangles (the name of the quadrangle was changed from Lemon Cove to Woodlake in 1952) show no infrastructure in the Project area itself, although the 1928 map shows a small dam on the St. Johns River downstream of the Project area. The 1952 map shows the current dam (P-54-004676) adjacent to the Project area and notes that the St. Johns River has gone dry. The 1969 revision to the 1952 map indicates water once again flowing in the St. Johns River and depicts dirt roads within the Project area (the same dirt roads still exist and were used by Æ during survey). The Project area is surrounded by the historic Visalia Electric Railroad, but this section of the electric railroad has not been formally recorded and does not intrude into the Project area.

4.2 NATIVE AMERICAN OUTREACH

On October 2, 2013, the NAHC responded to Æ's request and stated that the Sacred Lands File did not indicate the presence of sacred sites in the Project area. The NAHC provided Æ with a list of individuals and organizations to be contacted regarding information on Native American cultural resources in the Project area. Æ sent a letter soliciting concerns about the Project to the each of the individuals and tribes on October 2, 2013. Follow-up phone calls were made and emails sent on October 14, 2013. No further outreach was undertaken in 2020. The TID is responsible for government-to-government Native American consultation pursuant to CEQA and Assembly Bill 52.

To date, Æ has received responses from two of the seven individuals contacted (Table 4-3). A copy of Æ's Native American outreach log is provided in Appendix C.

Table 4-3
Excerpt from the Native American Outreach Log

Individual/Organization	Contact	Comments	Date Received
Santa Rosa Rancheria Tachi Yokut Tribe	Shana Brum	Brum stated that the Project is in a highly sensitive area and requested an on-site meeting and Native American monitoring during ground-disturbing activities. Brum further recommended that the Project proponent contact the Wukchumni Tribe.	10/7/13
Wuksache Tribe	Johnny Sartuche	Sartuche stated that the Project area is sensitive for cultural resources and requested that he be notified of any resources identified. He further recommended that the Project not proceed due to the sensitivity of the area.	10/14/13

4.3 FIELD SURVEY

The survey area is currently used as a cow pasture and is covered in seasonal grasses with a sparse scatter of live oaks, maples, and cottonwood trees. Cattle have recently eaten most of the grass cover, and mineral soil is visible throughout the proposed reservoir locations. Vegetation is dense in the reserved habitat area in the southeastern portion of the Project area. Approximately 90 percent of the survey area exhibited 60 percent or better ground visibility. The one exception is the westernmost end of the reserved habitat area, where dense berry vines and oak and maple trees resulted in poor ground visibility and prevented systematic transects. At these locations, the crew walked existing cattle trails, venturing into denser vegetation where feasible to look for features and artifacts. Ground visibility in the western portion of the reserved habitat area was approximately 10 percent.

Sediments within the survey area consist of poorly sorted coarse- to fine-grained sand and sandy loams, ranging from gray to light tan in color. Based on examination of rodent burrows and areas of disturbance, it appears that the soils are poorly developed, consistent with recent sediment deposition. During a visit to the Project area on October 7, 2013, TID Project Engineer Aaron Fukuda informed Æ's personnel that overflow water from the mines and reservoirs immediately north of the Project has washed over the Project area and into the river channels. It is possible that recent sediments overlie previously deposited cultural materials obscuring them from view.

4.3.1 Resources Within the Project Area

Æ's survey for the Project resulted in the discovery of two isolated artifacts—one from the historic era (P-54-005095/AE-2193-2) and one that is prehistoric P-54-005096 (AE-2193-3).

P-54-005095 is the collapsed remains of a wood object, likely a wagon. The majority of planks were too badly degraded to measure, but those that could be measured were 3.5 inches by 3.5 inches in cross section, and of unknown length due to decay and breakage (Figure 4-2). The hardware that held the planks together includes square nuts, round-headed nails, and metal rods of undetermined length (all were partially buried) that terminate in threaded nuts (Figure 4-3). The longer rods are consistent with cross rods of the sort that held the sides on wood wagons. None of the observed hardware is time diagnostic, but wood wagons would have been more common in the nineteenth and early twentieth centuries.

P-54-005096 is an isolated basalt flake (Figure 4-4). The flake is 4.5 centimeters long by 1.3 centimeters wide by 0.8 centimeters thick. It appears to be a secondary core reduction flake with no cortex. Three flake scars are present on its dorsal side.

4.3.2 Resources Immediately Outside the Project Area

Outside but immediately adjacent to the Project's eastern boundary are pieces of old machinery and a flatbed truck. These comprise a distinct scatter of unknown age and purpose. The bed, fenders, and cab of the truck are present, all other parts are missing (Figure 4-5). It appears to be a Ford flatbed truck, likely from the late 1930s to mid-1940s. It is not possible to determine when the truck was left at this location. The machinery appears to be parts of pulley and conveyor belt systems, consistent with equipment used in both mining and agriculture (Figures 4-6 and 4-7). The age of these objects is unknown, although their association with the

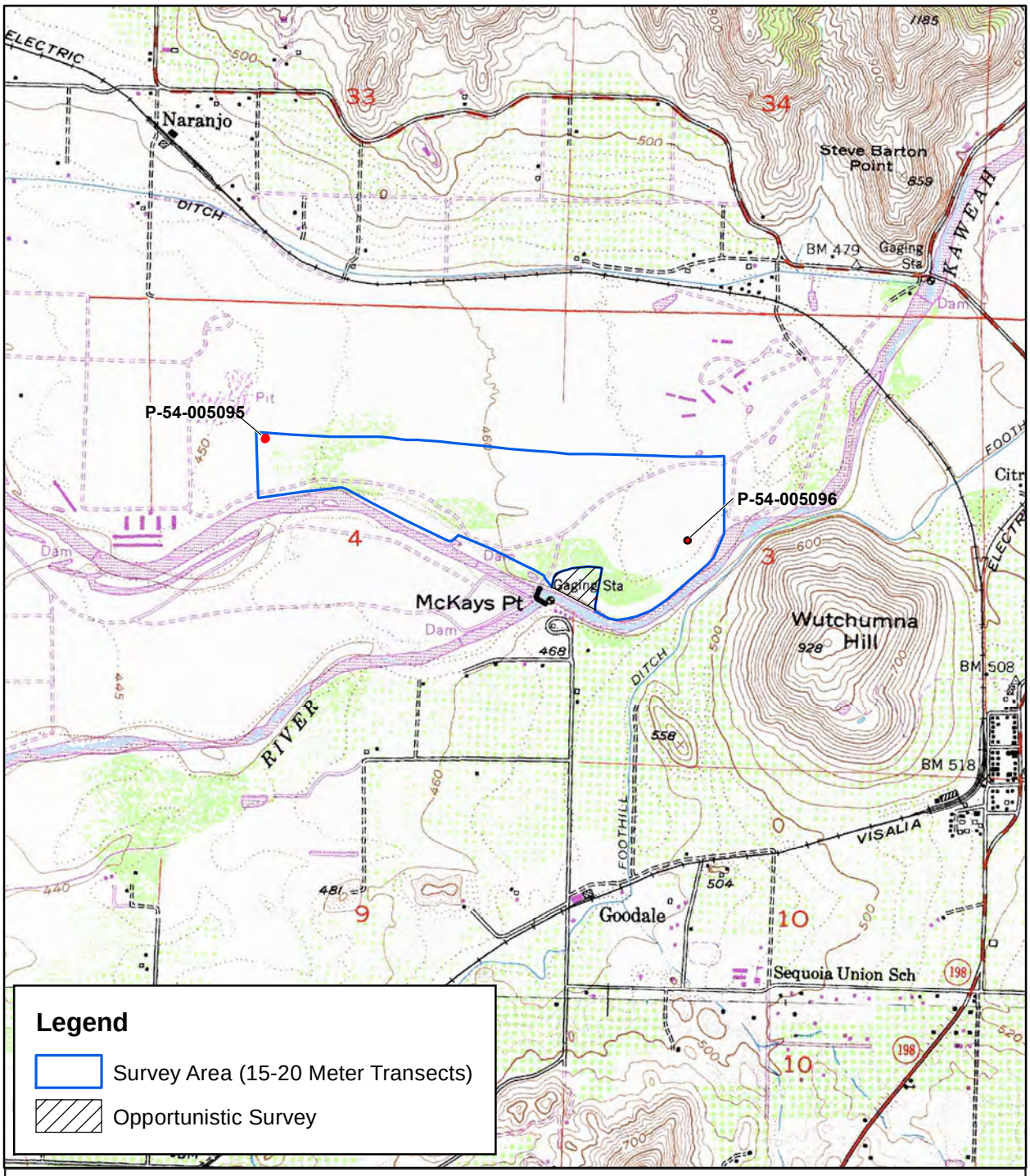


Figure 4-1 Location of cultural resources identified within the survey area.



Figure 4-2 Wood planks and hardware at AE-2193-2.



Figure 4-3 Close-up of long metal rods in AE-2193-2.



Figure 4-4 Ventral side of AE-2193-3.



Figure 4-5 Remains of truck near Project's eastern boundary; view to the east.



Figure 4-6 Machinery east of Project area; view to the east.



Figure 4-7 Machinery east of Project area; view to the north-northeast.

truck and the accumulation of sediments on parts of the machinery suggest that the truck and machinery were all deposited at or around the same time.

The Project, as currently designed, will not impact these objects, but their presence provides some information regarding the types of activities performed in the general vicinity of the Project. As such, they are worth noting, but they have not been formally recorded as cultural resources because they fall outside the Project area.

5
CONCLUSIONS AND RECOMMENDATIONS

TID, on behalf of the Visalia Water Company, and the Consolidated Peoples Ditch Company are proposing to build the McKay Point Reservoir Project in Tulare County. The construction of the Project requires compliance with the CEQA, which mandates that public agencies determine whether a proposed Project will have a significant effect on archaeological and historical resources, and, if so, whether the adverse effect can be avoided or mitigated.

As the first step in the CEQA process, Æ conducted a cultural resources inventory of the Project area. The purpose of the study was to identify cultural resources within the Project area and to assess whether additional studies are necessary. Subsequent phases of the CEQA process—which are not part of the scope of the current investigation—involve formally evaluating the significance and eligibility of identified cultural resources for inclusion in the CRHR, assessing potential Project impacts on significant resources, and applying mitigation measures to significant resources impacted by the development.

The following recommendations are based on the current understanding of both the Project and the resources. As additional information comes to light with regard to specific impacts associated with the Project, it may be necessary to revise, alter, or change the recommendations. As an alternative to additional studies, TID may elect to avoid potentially significant resources provided that such resources are protected from direct and incidental Project impacts.

5.1 SPECIFIC RECOMMENDATIONS

Æ discovered one historic-era isolate P-54-005095 and one prehistoric isolate P-54-005096 within the Project boundary. Isolates are objects lacking clear associations with other materials, time, or people, and as such can provide only limited information regarding history and prehistory. P-54-005095 and P-54-005096 are not unique, rare, or otherwise exceptional, and thus they are considered insignificant resources *a priori* under CRHR criteria because they lack important associations and scientific data potential. No further treatment of these resources is recommended.

However, isolated prehistoric artifacts may indicate the potential for significant buried archaeological deposits. There is high potential for the Project to uncover significant intact buried archaeological deposits given the Project's position on the landform and proximity to a meandering river environment that would have provided ideal habitat and rich sources for food and materials that would have sustained prehistoric Native American populations in the immediate area. Meandering river environments characterized by landforms that are subject to rapid alluvial deposition throughout time further increase the sensitivity of Project area. Further bolstering this point is the presence of an important Native American site across the Kaweah River southeast of the Project area.

Because of the high sensitivity for buried cultural resources in the Project area, Æ recommends two complimentary approaches to be completed prior to implementation of the Project: general Project area geoarchaeological testing and limited subsurface testing with shovels and augers at the location of P-54-005096. The latter would confirm if there is a larger intact buried archaeological deposit. If a more substantial deposit is identified, additional extended site testing would be needed to complete the CEQA-required assessment of the resource's significance and eligibility for inclusion in the CRHR. Geoarchaeological testing uses systems theory as a guiding framework to analyze patterns of geology, hydrology, sedimentology, and anthropogenic landscape use to interpret the potential for paleosols that may contain intact archaeological deposits within the study area (Schiffer 1987; Waters 1992). Subsurface coring or trenching then focuses on investigating key areas identified as having moderate to high potential for containing anthropogenic paleosols. Application of these recommendations would provide the CEQA Lead Agency with a more complete understanding of the potential for Project activities to cause adverse impacts to historical resources within the Project area.

5.2 GENERAL RECOMMENDATIONS

Consistent with state regulations, Æ advises that in the event archaeological resources are encountered during Project development or ground-disturbing activities within any portion of the Project area, all work within 100 feet (30 meters) of the find must be halted until a Secretary of the Interior qualified professional archaeologist can identify the discovery and assess its significance. Such finds include, but are not limited to, prehistoric stone grinding implements, stone tools, soapstone bowls, ornaments (e.g., beads, pendants), features such as burned soil, earthen ovens, and floors of shelters as well as intact historic-era building foundations and concentrations of historic artifacts.

If human remains are uncovered during construction, the Tulare County Coroner is to be notified immediately and must investigate the discovery. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 requires that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend means of treatment for the human remains pursuant to California Public Resources Code 5097.98.6.

6
REFERENCES

Armstrong, Matthew D., and Jay B. Lloyd
2014 *Cultural Resources Survey for the McKay Point Reservoir Project, Tulare County, California.* Applied EarthWorks, Inc., Fresno, California. Prepared for Sespe Consulting, Inc., Ventura, California

Baloian, Randy
2009 *Archaeological Survey Report, City of Hanford Railroad Spur Project for the Kings Industrial Park, Kings County, California.* Applied EarthWorks, Inc., Fresno, California. Prepared for URS Corporation, Fresno, California. Submitted to City of Hanford, California, and California Department of Transportation, District 6, Fresno.

City of Woodlake
2013 History, Web page, http://www.cityofwoodlake.com/home.asp?icat=history, accessed October 4, 2013.

Clifford, Heather, and Jessica DeBusk
2014 *Paleontological Resource Assessment for the McKay Point Reservoir Project, Tulare County, California*. Applied Earthworks, Inc., Fresno, California. Prepared for Sespe Consulting, Inc., Ventura, California.

Cone, Victor M.
1911 *Irrigation in the San Joaquin Valley, California.* USDA Office of Experiment Stations Bulletin 239. Government Printing Office, Washington, D.C.

Davis, James T.
1961 Trade Routes and Economic Exchange among the Indians of California. *Reports of the University of California Archaeological Survey* 54:1–71. Berkeley.

Dillon, Brian D.
1992 *Excavations at the Sunset Point Site (CA-TUL-1052), Mountain Home Demonstration Forest, Tulare County, California*. CDF Archaeological Reports No. 11. California Department of Forestry and Fire Protection, Sacramento.

Fenenga, Gerrit L.
1993 Test Excavations at the Witt Site (CA-KIN-32). In *Contributions to Tulare Lake Archaeology II, Finding the Evidence: The Quest for Tulare Lake's Archaeological Past,* edited by William J. Wallace and Francis A. Riddell, pp. 25–38. Tulare Lake Archaeological Research Group, Redondo Beach, California.

Fredrickson, David A., and Joel W. Grossman
1977 A San Dieguito Component at Buena Vista Lake, California. *Journal of California Anthropology* 4:173–190.

Gifford, Edward W., and W. Egbert Schenck
1926 Archaeology of the Southern San Joaquin Valley, California. *University of California Publications in American Archaeology and Ethnology* 23(1):1–122.

Golla, Victor
2011 *California Indian Languages.* University of California Press, Berkeley and Los Angeles

Grossman, Joel W.
1968 *Early Cultural Remains at Buena Vista Lake, California: Report on the 1965 Season of Field Investigations.* California Department of Parks and Recreation, Sacramento.

Hanson, Victor Davis
2006 Zola in San Francisco, a review of "Frank Norris: A Life," by Joseph R. McElrath Jr. and Jesse S. Crisler. *New York Times*, 1 January 1. Online version, http://www.nytimes.com/2006/01/01/books/review/01hanson.html?_r=0, accessed October 18, 2013.

Kaweah Commonwealth, The
n.d. The History of Lemon Cove, California. Web page, http://www.kaweah commonwealth.com/lemoncovehistory.html, accessed October 4, 2013.

Kroeber, Alfred L.
1976 *Handbook of the Indians of California.* Reprinted. Dover, New York. Originally published 1925, Bureau of American Ethnology Bulletin 78, Smithsonian Institution, Washington, D.C.

Latta, Frank F.
1999 *Handbook of Yokuts Indians*. 50th anniversary ed. Brewer's Historical Press, Exeter, California, and Coyote Press, Salinas, California.

Macias, Melissa
2021 *Paleontological Resource Assessment for the McKay Point Reservoir Project, Tulare County, California.* Applied EarthWorks, Inc., Pasadena, California. Prepared for Sespe Consulting, Inc., Ventura, California.

Meighan, Clement W., Brian D. Dillon, and Douglas V. Armstrong
1988 *Success Lake, Intensive Cultural Resources Survey, Tulare County, California.* Institute of Archaeology, University of California, Los Angeles. Submitted to the U.S. Army Corps of Engineers, Sacramento District.

Meighan, Clement W., Brian D. Dillon, Douglas V. Armstrong, Paul Farnsworth, David S. Whitley, Elliot A. Gehr, Leslie Conton, and Richard H. Dillon
1988 *Lake Kaweah Intensive Cultural Resources Survey.* Institute of Archaeology, University of California, Los Angeles. Prepared for the U.S. Army Corps of Engineers, Sacramento District, Contract No. DACW05-83-C-0107.

Menefee, Eugene L., and Fred A. Dodge
1913 *History of Tulare and Kings Counties, California.* Historic Record Company, Los Angeles, California.

Moratto, Michael J.
1984 *California Archaeology.* Academic Press, Orlando, Florida.

Office of Historic Preservation
1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format.* Electronic document, http://ohp.parks.ca.gov/pages/1054/files/armr.pdf, accessed October 4, 2013. California Office of Historic Preservation, Sacramento.

Norris, Robert M., and Robert W. Webb
1990 *Geology of California.* 2nd ed. John Wiley & Sons, New York.

Preston, William L.
1981 *Vanishing Landscapes: Land and Life in the Tulare Lake Basin.* University of California Press, Berkeley.

Riddell, Francis A.
1951 The Archaeology of Site KER-74. *Reports of the University of California Archaeological Survey* 10:1–28.

Rosenthal, Jeffrey S., Gregory G. White, and Mark Q. Sutton
2007 The Central Valley: A View from the Catbird's Seat. In *California Prehistory: Colonization, Culture, and Complexity,* edited by Terry L. Jones and Kathryn A. Klar, pp. 147–163. AltaMira Press, Lanham, Maryland.

Sampson, Michael
1991 A Distinctive Flaked-Stone Tool Type from Tulare Lake Basin. In *Contributions to Tulare Lake Archaeology I: Background to a Study of Tulare Lake's Archaeological Past,* edited by William J. Wallace and Francis A. Riddell, pp. 53–60. Tulare Lake Archaeological Research Group, Redondo Beach, California.

Schiffer, Michael B.
1987 *Formation Processes of the Archaeological Record*. University of New Mexico Press, Albuquerque.

Silverstein, Michael
1978 Yokuts: Introduction. In *California*, edited by Robert F. Heizer, pp. 446–447. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Small, Kathleen Edwards
1926 *History of Tulare County, California.* 2 vols. S. J. Clarke Publishing, Chicago, Illinois.

Sutton, Mark Q.
1997 A Background for Archaeological Investigations at Buena Vista Lake, Southern San Joaquin Valley, California. *Kern County Archaeological Society Journal* 8:3–21.

Tule River Indian Tribe
2011 History of Tule River Band of Yokut Indians. Electronic document, http://www.tulerivertribe-nsn.gov/printpdf/14, accessed October 4, 2013.

Walker, Edwin F.
1947 *Excavation of a Yokuts Indian Cemetery.* Kern County Historical Society, Bakersfield, California.

Wallace, William J.
1978a Northern Valley Yokuts. In *California*, edited by Robert F. Heizer, pp. 462–470. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

1978b Southern Valley Yokuts. In *California*, edited by Robert F. Heizer, pp. 448–461. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Wallace William J., Edith Wallace, and Virgil Meeker
1989 *The Prehistory of Mountain Home State Forest: A Region of Seasonal Occupation and Exploitation.* California Department of Forestry and Fire Protection Archaeological Reports No. 4. Sacramento.

Warren, Claude N., and M. B. McKusick
1959 A Burial Complex from the Southern San Joaquin Valley. *University of California, Los Angeles Archaeological Survey Annual Report* 1959:17–26.

Waters, Michael R.
1992 *Principles of Geoarchaeology*. University of Arizona Press, Tucson.

Wedel, Waldo R.
1941 *Archaeological Investigations at Buena Vista Lake, Kern County, California.* Bureau of American Ethnology Bulletin 130. Smithsonian Institution, Washington, D.C.

APPENDIX A

Personnel Qualifications

DIANA TERESA DYSTE

Managing Principal/Principal Archaeologist

Areas of Expertise

- Cultural resource management
- Ethnography
- Tribal consultation
- Zooarchaeological, paleoethnobotanical, and ground stone analysis

Years of Experience

- 20

Education

Ph.D. candidate, Anthropology/ Feminist Studies, University of California, Santa Barbara

M.A., Anthropology (Archaeology/ Cultural Resource Management emphasis), University of California, Santa Barbara, 2010

B.A., Anthropology, University of California, Santa Barbara, 2002

A.A., Liberal Arts and Sciences, Ventura College, 1999

Registrations/Certifications

- Registered Professional Archaeologist 39362477

Permits/Licensure

- Principal Investigator, California BLM Statewide Cultural Resources Use Permit CA-18-22

Professional Affiliations

- American Anthropological Association
- American Cultural Resources Association
- Santa Barbara Museum of Natural History
- Society for American Archaeology
- Society for California Archaeology
- World Archaeological Congress

Professional Experience

2020–	Managing Principal/Principal Archaeologist, Applied EarthWorks, Inc., Fresno, California
2018–2020	Senior Archaeologist, Applied EarthWorks, Inc., Fresno, California
2015–2018	Interim Cultural Resources Supervisor and Senior Archaeologist/Ethnographer, Aspen Environmental Group
2007–2009	Archaeologist (GS-9), U.S. Department of Agriculture, Los Padres National Forest
2005–2007	Archaeologist (GS-7), U.S. Department of Agriculture, Los Padres National Forest
2004–2005	Archaeological Contractor, Padre, Inc., Ventura, California
2000–2005	Archaeologist (GS-4/5), U.S. Department of Agriculture, Los Padres National Forest

Technical Qualifications

Ms. Dyste has 20 years of experience in cultural resources management and meets the Secretary of the Interior's qualification criteria as an archaeologist. She has extensive experience preparing environmental documents and managing complex projects pursuant to applicable federal, state, and local regulations. Her work includes senior review or prime authorship of cultural resources documents for National Historical Preservation Act Section 106, National Environmental Policy Act, and California Environmental Quality Act compliance, including public and tribal comment and response; development of research designs; design and implementation of cultural resource plans. Ms. Dyste is qualified to conduct archaeological survey, as well as zooarchaeological, paleoethnobotanical, lithics, and ethnographic analyses. She is able to analyze cultural spatial patterns via use of Geographic Information Systems software. Ms. Dyste's Assembly Bill 52 and NHPA Section 106 tribal consultation services are informed by her knowledge and training in Native American jurisprudence, cultural sensitivity training, and graduate seminars in Native American environmental law, indigenous research methodologies, and community-based Participatory Action Research with tribal and special interest groups. She has project experience in coastal, highlands, grasslands, desert, and remote mountain settings across the state of California, although her academic region of specialty is in central and southern California with a focus on Salinan, Esselan, northern/interior/coastal Chumash prehistoric and modern political tribal groups. Ms. Dyste is a native Spanish speaker and assists clients with the translation of English to Spanish signage and public notices.

D. Gail Bellenger

Senior Archaeologist

Areas of Expertise

- Cultural resource management
- Prehistoric archaeology
- Native American outreach and tribal consultation
- Project management

Years of Experience

- 15

Education

M.A., Public Archaeology, California State University, Northridge, 2016

B.S., Environmental Resource Management, University of Nevada, Reno, 1996

B.A., Anthropology, University of Nevada, Reno, 1994

Registrations/Certifications

- Registered Professional Archaeologist 41587764

Professional Affiliations

- Society for California Archaeology

Professional Experience

2020–	Senior Archaeologist, Applied EarthWorks, Inc., Fresno, California
2018–2020	Archaeologist and Senior Biologist, EMC Planning Group, Monterey, California
2016–2018	Environmental Manager, Project Engineering Company, West Jordan, Utah
2001–2004	Environmental Scientist IV-Cultural Resources and Environmental Resources, Nevada Department of Transportation, Carson City, Nevada
1997–1999	Co-op Archaeologist, Bureau of Land Management, Battle Mountain, Nevada
1995–1997	Curatorial Assistant, Nevada State Museum Anthropology Department, Carson City, Nevada
1994–1995	Paleoclimatology Lab Intern, Desert Research Institute, Reno, Nevada

Technical Qualifications

Ms. Bellenger has 15 years of experience in cultural resource and environmental resource management and meets the Secretary of the Interior's qualification criteria as an archaeologist. Her areas of expertise include the prehistory of the central California coast and the Great Basin. She has prepared several National Register nominations and has experience preparing a variety of environmental documents. She has managed complex projects pursuant to applicable federal, state, and local regulations, including large- and small-scale projects requiring compliance with National Historical Preservation Act (NHPA) Section 106, National Environmental Policy Act (NEPA), and California Environmental Quality Act (CEQA). Ms. Bellenger is qualified to conduct archaeological surveys and construction monitoring. She has worked in desert, coastal, highlands, and remote locations throughout Nevada, Utah, and California. Her recent experience encompasses projects in central and central coastal California with a focus on Salinan, Esselen, and Ohlone tribes.

JESSICA JONES

Staff Archaeologist/Project Manager

Areas of Expertise

- Geographic Information Systems (GIS) in archaeology
- Computer-generated maps and graphics
- Archaeological survey and excavation

Years of Experience

- 7

Education

B.A., Anthropology, California State University, Sacramento, 2013

Archaeological Technician Certificate, Anthropology Department, Fresno City College, Fresno, California, 2011

Affiliations

Society for California Archaeology

Professional Experience

2020–	Staff Archaeologist/Project Manager, Applied EarthWorks, Inc. Fresno, California
2017–	Staff Archaeologist/GIS Specialist, Applied EarthWorks, Inc. Fresno, California
2015–2017	Geographic Information Systems (GIS) Technician, Applied EarthWorks, Inc., Fresno, California
2012–2013	Laboratory Technician (volunteer), Archaeological Research Center, California State University, Sacramento
2009–2010	Laboratory Technician (volunteer), Fresno City College, Fresno, California

Technical Qualifications

As a Staff Archaeologist, Ms. Jones performs Native American outreach, archival research, pedestrian archaeological and built environment survey, site recordation and evaluation, and partakes in archaeological excavation for projects throughout the Central Valley and Sierra Nevada foothills. She serves as a primary author or contributor for cultural resource inventory reports and is experienced in the preparation of California Department of Parks and Recreation (DPR) cultural resource record forms (523 series) and California Department of Transportation cultural resource documents. Ms. Jones has managed several water infrastructure improvement projects in the Central Valley and has working knowledge of Section 106 of the National Historic Preservation Act and California Environmental Quality Act regulatory frameworks. Her expertise also includes work as a Geographic Information Systems (GIS) technical specialist. She has extensive experience as a cartographer and spatial data manager for large and small projects involving both prehistoric and historic-era built environment cultural resources, particularly linear resources such as historic-era canal systems and related pumps, basins, and other components. Ms. Jones is a critical component of Æ's digital technology program, responsible for instructing cultural and paleontological staff in the use of ESRI ArcGIS software. Her background also includes extensive experience volunteering in archaeological repositories where she gained expertise in laboratory processing, cataloging, and management of archaeological collections.

APPENDIX B

Records Search Results

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

FRESNO KERN KINGS MADERA TULARE

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 46 MEC
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289 FAX (661) 654-2415
E-mail: ssjvic@csub.edu

TO: Matthew Armstrong **(RS# 13-403)**
Applied EarthWorks, Inc.
1391 West Shaw Ave., Suite C
Fresno, CA 93711

DATE: October 14, 2013

RE: 2193 - McKay Point Reservoir Project

CO: Tulare

MAP(s) Woodlake 7.5'

CULTURAL RESOURCES RECORDS SEARCH

The following are the results of a search of the cultural resources site record files at the Southern San Joaquin Valley Information Center. These files include known and recorded archaeological and historic sites, inventories and excavation reports filed with this office, and properties listed on the National Register of Historic Places, the Historic Property Data File (3/18/13), the California Register, the California Historical Landmarks, the California Inventory of Historic Resources and the California Points of Historical Interest.

PRIOR CULTURAL RESOURCE INVENTORIES WITHIN THE REQUESTED SEARCH AREA AND A ONE-HALF MILE RADIUS

According to the information in our files, there have been no cultural resource studies conducted within the project area. There have been two (2) studies conducted within the one-half mile radius, TU-01365 and TU-01394. Study locations and their associated report numbers are shown on the project map.

RECORDED AND/OR KNOWN CULTURAL RESOURCES WITHIN THE REQUESTED SEARCH AREA AND A ONE-HALF MILE RADIUS

There is one (1) recorded cultural resource within the project area, P-54-004676. There are two (2) recorded cultural resources within a one-half mile radius, P-54-000316 and P-54-004587. Resource locations and their associated primary numbers are shown on the project map.

(RS# 13-403)

There are no cultural resources within the project area or radius that are listed or are eligible to be listed in the National Register of Historic Places, the California Register, the California Inventory of Historic Resources, The California State Historic Landmarks, or the California Points of Historical Interest.

COMMENTS/RECOMMENDATIONS

Requested documents are enclosed. If you have any questions or need additional information, please contact our office at (661) 654-2289.

By:



Celeste M. Thomson, Coordinator Date: October 14, 2013

Please note that invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

SSJVIC Bibliography

TU-01365

Author(s): Catherine Lewis Pruett
Year: 2009
Title: A Cultural Resources Assessment for Approximately 30 Acres, Located Northeast of Visalia, Tulare County, California
Affliliation: Three Girls and A Shovel, LLC
Resources: 54-004587, 54-004676
Quads: Woodlake
Pages: 48
Notes:

TU-01394

Author(s): Parr, Robert
Year: 2009
Title: Cultural Resource Assessment for the Replacement of Eleven Deteriorated Power Poles on the Southern California Edison Company Bravo, Cairns, Campbell, Homer, Merryman, and Redbanks 12 kV Circuits Tulare County, California
Affliliation: Cal Heritage
Resources:
Quads: Cairns Corner, Exeter, Ivanhoe, Lindsay, Porterville, Rocky Hill, Woodlake
Pages: 18
Notes: NEGATIVE

SSJVIC Resource Detail: P-54-000316

Identifying Information

Primary No.: P-54-000316
HRI No.:
Trinomial: CA-TUL-316
Name:
Other IDs:
Disclosure: Not for publication

Attributes

Resource Type: ☐ Building ☐ Structure ☐ Object ☑ Sit ☐ District ☐ Element of District ☐ Other
Age: ☑ Prehistoric ☐ Protohistoric ☐ Historic ☐ Unknown
Information Base: ☐ Surface survey ☐ Surface collection ☐ Testing ☐ Excavation ☐ Analysis
Collections: Unknown
Attribute Codes: AP16 Other metate

Recording Events

Date	*Recorder(s)*	*Affiliation*	*Notes*
	Von Werlhof		Date unknown

Associated Documents

Notes

village site

Location Info

County: Tulare
USGS 7.5' Quads: Woodlake
Address:

Cross-references

Management status

Database Record Metadata

	Date	*User*
Entered:	10/9/2013	ssjvic
Last Modified:	10/9/2013	ssjvic

IC Actions:	*Date*	*User*	*Action taken*
	10/9/2013	ssjvic	Entered: CT

SSJVIC Resource Detail: P-54-004587

Identifying Information

Primary No.: P-54-004587
HRI No.:
Trinomial:
Name: McKays Point - Terminus Beach
Other IDs:
Disclosure: Unrestricted

Attributes

Resource Type: ☐ Building ☐ Structure ☐ Object ☑ Sit ☐ District ☐ Element of District ☐ Other
Age: ☐ Prehistoric ☐ Protohistoric ☑ Historic ☐ Unknown
Information Base: ☑ Surface survey ☐ Surface collection ☐ Testing ☐ Excavation ☐ Analysis
Collections: Unknown
Attribute Codes: AH16 Other Historic Recreation Area

Recording Events

Date	*Recorder(s)*	*Affiliation*	*Notes*
10/1/2008	Catherine Pruett	Three Girls and a Shovel	

Associated Documents

Report No.	*Year*	*Title*
TU-01365	2009	A Cultural Resources Assessment for Approximately 30 Acres, Located Northeast of Visalia, Tulare County, California

Notes

Location Info

County: Tulare
USGS 7.5' Quads: Woodlake
Address:

Cross-references

Management status

Database Record Metadata

	Date	*User*	
Entered:	10/9/2013	ssjvic	
Last Modified:	10/9/2013	ssjvic	
IC Actions:	*Date*	*User*	*Action taken*
	10/9/2013	ssjvic	Entered: CT

SSJVIC Resource Detail: P-54-004676

Identifying Information

Primary No.: P-54-004676
HRI No.:
Trinomial:
Name: Water Control Structure
Other IDs:
Disclosure: Unrestricted

Attributes

Resource Type: ☐ Building ☑ Structure ☐ Object ☐ Sit ☐ District ☐ Element of District ☐ Other
Age: ☐ Prehistoric ☐ Protohistoric ☑ Historic ☐ Unknown
Information Base: ☑ Surface survey ☐ Surface collection ☐ Testing ☐ Excavation ☐ Analysis
Collections: Unknown
Attribute Codes: AH08 Dams

Recording Events

Date	*Recorder(s)*	*Affiliation*	*Notes*
10/1/2008	Catherine Pruett	Three Girls and a Shovel	

Associated Documents

Report No.	*Year*	*Title*
TU-01365	2009	A Cultural Resources Assessment for Approximately 30 Acres, Located Northeast of Visalia, Tulare County, California

Notes

Location Info

County: Tulare
USGS 7.5' Quads: Woodlake
Address:

Cross-references

Management status

Database Record Metadata

	Date	*User*	
Entered:	10/9/2013	ssjvic	
Last Modified:	10/9/2013	ssjvic	
IC Actions:	*Date*	*User*	*Action taken*
	10/9/2013	ssjvic	Entered: CT

California Historical Resources Information System



Fresno
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
E-mail: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

11/30/2020

Gail Bellenger
Applied Earthworks, Inc.
1391 West Shaw Avenue, Suite C
Fresno, CA 93711

Re: 4246-McKay Point Reservoir Project
Records Search File No.: 20-417

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Woodlake USGS 7.5' quad. The following reflects the results of the records search for the project area and the 0.5 mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☐ custom GIS maps ☒ GIS data

Resources within project area:	P-54-005095, 005096
Resources within 0.5 mile radius:	P-54-000316, 004034, 004587, 004615, 004676
Reports within project area:	TU-01668
Reports within 0.5 mile radius:	TU-01365, 01394, 01498

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Report Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☐ enclosed	☒ not requested	☐ nothing listed
OHP Built Environment Resources Directory:	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☐ not requested	☒ nothing listed

Caltrans Bridge Survey: Not available at SSJVIC; please see

http://www.dot.ca.gov/hq/structur/strmaint/historic.htm

Ethnographic Information: Not available at SSJVIC

Historical Literature: Not available at SSJVIC

Historical Maps: Not available at SSJVIC; please see
http://historicalmaps.arcgis.com/usgs/

Local Inventories: Not available at SSJVIC

GLO and/or Rancho Plat Maps: Not available at SSJVIC; please see
http://www.glorecords.blm.gov/search/default.aspx#searchTabIndex=0&searchByTypeIndex=1 and/or
http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items

Shipwreck Inventory: Not available at SSJVIC; please see
http://www.slc.ca.gov/Info/Shipwrecks.html

Soil Survey Maps: Not available at SSJVIC; please see
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Celeste M. Thomson
Coordinator

APPENDIX C

Native American Outreach

Native American Outreach

McKay Point Reservoir Project

Organization	Name	Position	Letter	E-mail	Phone	Summary of Contact
Native American Heritage Commission	Dave Singleton	Program Analyst	10/02/13	09/30/13		Received a negative Sacred Lands file Search and a list of contacts from NAHC.
Tule River Indian Tribe	Neil Peyron	Chairperson	10/02/13	10/14/13		
Santa Rosa Tachi Rancheria	Lalo Franco	Cultural Coordinator	10/02/13			Received email from Mr. Franco's co-worker Shana Brum on October 7. The email stated that the project area is sensitive and Ms. Brum recommended an on-site meeting, Native American Monitoring during any ground disturbing activities, and contact with the Wukchumni Tribe about this project.
Wuksache Indian Tribe/Eshom Valley Band	Kenneth Woodrow	Chairperson	10/02/13	10/14/13		
Tule River Indian Tribe	Kerri Vera	Environemntal Department	10/02/13		10/14/13	Left voice mail message on 10/14
Wuksache Tribe	John Sartuche		10/02/13	10/14/13		Mr. Sartuche stated that the project area is sensitive for cultural resources, and requested that he be notified of any resources identified. He further recommended that the project not proceed due to the sensitivity of the area.
Tule River Indian Tribe	Joey Garfield	Tribal Archaeologist	10/02/13		10/14/13	Left voice mail message on 10/14
	Jennifer Malone		10/02/13	10/14/13		

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor
NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
(916) 373-3715
Fax (916) 373-5471
www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

October 2, 2013

Mr. Matthew Armstrong
Applied EarthWorks, Inc.
1391 West Shaw Avenue, Suite C
Fresno, CA 93177-3600

Sent by FAX to: 559-229-2019
No. of Pages: 3

Re: Request for Sacred Lands File Search and Native American Contacts list for the **"McKay Point Reservoir Project;"** located in Tulare County, California

Dear Mr. Armstrong:

A record searches of the NAHC Sacred Lands File **failed to indicate** the presence of Native American traditional cultural place(s) in the project sites submitted, based on the USGS coordinates submitted as part of the 'Area of Potential Effect.'(APE). However, there are Native American cultural resources in close proximity to the APE. Also, the absence of archaeological resources does not preclude their existence. Other data sources for Native American sacred places/sites should also be contacted. A Native American tribe of individual may be the only sources of presence of traditional cultural places or sites.

In the 1985 Appellate Court decision (170 Cal App 3rd 604; *EPIC v. Johnson*), the Court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources impacted by proposed projects, including archaeological places of religious significance to Native Americans, and to Native American burial sites.

Attached is a list of Native American tribes, individuals/organization who may have knowledge of cultural resources in or near the project area. As part of the consultation process, the NAHC recommends that local governments and project developers contact the tribal governments and individuals to determine if any cultural places might be impacted by the proposed action. If a response is not received in two weeks of notification the NAHC requests that a follow telephone call be made to ensure that the project information has been received.

If you have any questions or need additional information, please contact me at (916) 373-3715.

Sincerely,

Dave Singleton
Program Analyst

Attachments

Native American Contacts
Tulare County
October 2, 2013

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589 Yokuts
Porterville , CA 93258
chairman@tulerivertribe-nsn.
(559) 781-4271
(559) 781-4610 FAX

Santa Rosa Tachi Rancheria
Lalo Franco, Cultural Coordinator
P.O. Box 8 Tachi
Lemoore , CA 93245 Tache
(559) 924-1278 - Ext. 5 Yokut
(559) 924-3583 - FAX

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas , CA 93906 Mono
kwood8934@aol.com Wuksache
831-443-9702

Tule River Indian Tribe
Kerri Vera, Environmental Department
P.O. Box 589 Yokuts
Porterville , CA 93258
(559) 783-8892

Wuksache Tribe
John Sartuche
1028 East "K" Avenue Wuksache
Visalia , CA 93292
signsbysarch@aol.com
(559) 636-1136

Tule River Indian Tribe
Joey Garfield, Tribal Archeological
P.O. Box 589 Yokuts
Porterville , CA 93258
(559) 783-8892

Jennifer Malone
637 E Lakeview Wukchumni
Woodlake , CA 93286 Tachi
indianpopup@sbcglobal.net Yowlumni
559-564-2146 - home
559-280-0712 - cell

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

his list s only applicable for contacting local Native Americans with regard to cultural resources for the proposed McKay Point Reservoir Project; located in Tulare County, California for which a Sacred Lands File search and Native American Contacts list were requested.

EXAMPLE

Applied EARTHWORKS Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711-3600
O: (559) 229-1856 | F: (559) 229-2019

October 2, 2013

Neil Peyron
Chairperson
Tule River Indian Tribe
PO Box 589
Porterville, CA 93258

RE: McKay Point Reservoir Project, Tulare County, CA

Mr. Neil Peyron,

Applied EarthWorks, Inc. (Æ) is currently providing cultural resources services to the Tulare Irrigation District (TID), in support of the McKay Point Reservoir Project. On behalf of our clients, we are conducting Native American consultation and performing other tasks related to cultural resources management. The project is subject to the requirements of the California Environmental Quality Act.

TID proposes to build a water storage/regulation facility near the confluence of the St. Johns River and the Lower Kaweah River in Tulare County, California. The project area lies within T18S, R 27E, Sections 3 and 4, as shown on the Woodlake 7.5 USGS quadrangle (see attached map).

A record search has been requested for the Project, and results are pending.

Your name and address were provided to us by the Native American Heritage Commission. If you have information on sacred or special sites in the area or if you have any interest about the project, please call me or send a letter to my attention. Your comments will be included in our cultural resources report. You can contact me during normal business hours (559-229-1856) if you have any questions or need additional information. Thank you.

Sincerely,



Jay B. Lloyd,
Project Administrator

encl.: Project Map

APPENDIX D

Cultural Resource Records

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 54-005095
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

 Resource Name or # AE-2193-2

P1. Other Identifier:

*__P2. Location: a. County:__ Tulare ☒ **Not for Publication** ☐ **Unrestricted**
b. USGS 7.5′ Quad: Woodlake **Date:** 1952 (rev. 1969) T 18S, R 27E; SW ¼ **of** SE ¼ **of** Sec. 4 M.D. **B.M.**
c. Address:
d. UTM: NAD 83, Zone 11; 315441 **mE /** 4029656 **mN**
e. Other Locational Data: From the intersection of Highway 245 and Avenue 332 south of Woodlake, proceed east on Avenue 332 for approximately 1.2 miles to a locked ranch gate. Proceed through the gate and continue on the dirt ranch road for approximately 0.7 miles to the dam over the St. John's River. Proceed north over the dame, and then continue west on the dirt road for approximately 0.8 miles to the fence at the western edge of the project area. Turn north and continue for approximately 0.1 miles to the northwest corner of the property. The resource is located approximately 100 feet southeast of the fencepost at the northwest corner of the property.

***P3a. Description:** AE-2193-2 is a historic debris scatter, and represents the remains of a collapsed wooden structure or device. The remains include lumber and metal hardware scattered across a small area in the northwest corner of a cattle pasture. The majority of the planks were too badly degraded to measure, but those that could be measured were 3.5 inches by 3.5 inches in cross-section, and of unknown length due to decay and breakage. The hardware that held the planks together includes ¾-inch square nuts, round-headed nails, and metal rods of undetermined length (all were partially buried) that terminate in threaded nuts. The threaded rods are consistent with crossroads and indicate that these materials are the remains of a wooden wagon. None of the observed hardware is time diagnostic, but wooden wagons would have been used primarily in the 19th and early 20th centuries.

***P3b. Resource Attributes:** AH16 (Other: Vehicle Remains)

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☒ Other: Isolate

***P5a. Photograph or Drawing:**



P5b. Description of Photo: Overview, view to the north.

***P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☒ Historic ☐ Both

***P7. Owner and Address:**
Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

***P8. Recorded By:** M. Armstrong
Applied EarthWorks, Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711

***P9. Date Recorded:** 10/11/13

***P10. Survey Type:** ☒ Intensive
☐ Reconnaissance ☐ Other
Describe: Pedestrian survey using 15-meter transects.

***P11. Report Citation:** Matthew D. Armstrong and Jay B. Lloyd
2014 *Cultural Resources Survey for the McKay Point Reservoir Project, Tulare County, California.* Applied EarthWorks, Inc., Fresno, California. Submitted to Sespe Consulting, Inc., Ventura, California.

***Attachments:**
☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet
☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record
☐ Photograph Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Other (list):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 54-005095

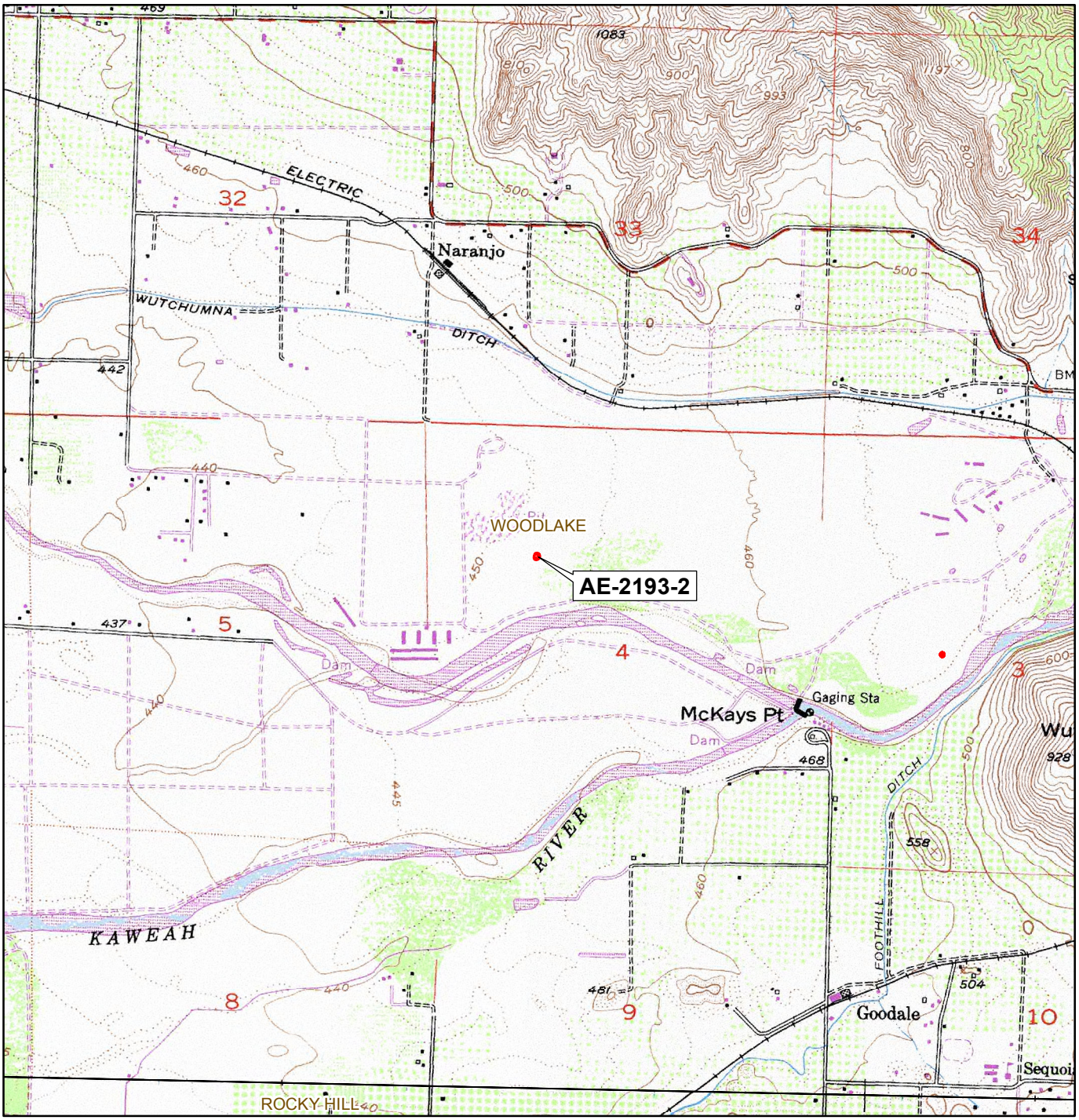
Trinomial

***Resource Name or #:** AE-2193-2

***Scale:** 1:24,000

***Map Name:** Woodlake, CA USGS 7.5' quadrangle

***Date:** 1952 (1969)



1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

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TRUE NORTH

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 54-005096
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

 Resource Name or # AE-2193-3

P1. Other Identifier:

*__P2. Location: a. County:__ Tulare ☒ **Not for Publication** ☐ **Unrestricted**
b. USGS 7.5′ Quad: Woodlake **Date:** 1952 (rev. 1969) T 18S, R 27E; SE ¼ **of** NW ¼ **of** Sec. 3 M.D.**B.M.**
c. Address: None
d. UTM: NAD 83, Zone 11; 317080 **mE /** 4029257 **mN**
e. Other Locational Data: From the intersection of Highway 245 and Avenue 332 south of Woodlake, proceed east on Avenue 332 for approximately 1.2 miles to a locked ranch gate. Proceed through the gate and continue on the dirt ranch road for approximately 0.7 miles to the dam over the St. John's River. Proceed north over the dam, and leave the vehicle. Walk east along the dirt road above the riverbank for approximately 1500 feet as it turns from southeast to northeast. Where the dirt road turns due north, proceed at 254 degrees for approximately 460 feet to reach the isolate.

***P3a. Description:** AE-2193-3 is an isolated basalt flake. The flake measures 4.5 centimeters long by 1.3 centimeters wide by 0.8 centimeters thick. It appears to be a relatively large secondary core reduction flake. It exhibits no clear cortex and has three flake scars on its dorsal side.

***P3b. Resource Attributes:** AP2 (lithics)

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☒ Other: Isolate

***P5a. Photograph or Drawing:**



P5b. Description of Photo: Dorsal side of flake.

***P6. Date Constructed/Age and Sources:** ☒ Prehistoric ☐ Historic ☐ Both

***P7. Owner and Address:**
Tulare Irrigation District
6826 Avenue 240
Tulare, CA 93274

***P8. Recorded By:** M. Armstrong, E. Rapp
Applied EarthWorks, Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711

***P9. Date Recorded:** 10/11/13

***P10. Survey Type:** ☒ Intensive ☐ Reconnaissance ☐ Other
Describe: Pedestrian survey utilizing 15–20 meter transects.

***P11. Report Citation:** Matthew D. Armstrong and Jay B. Lloyd 2014 *Cultural Resources Survey for the McKay Point Reservoir Project, Tulare County, California.* Applied EarthWorks, Inc., Fresno, California. Submitted to Sespe Consulting, Inc., Ventura, California.

***Attachments:**
☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet
☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record
☐ Photograph Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Other (list):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 54-005096

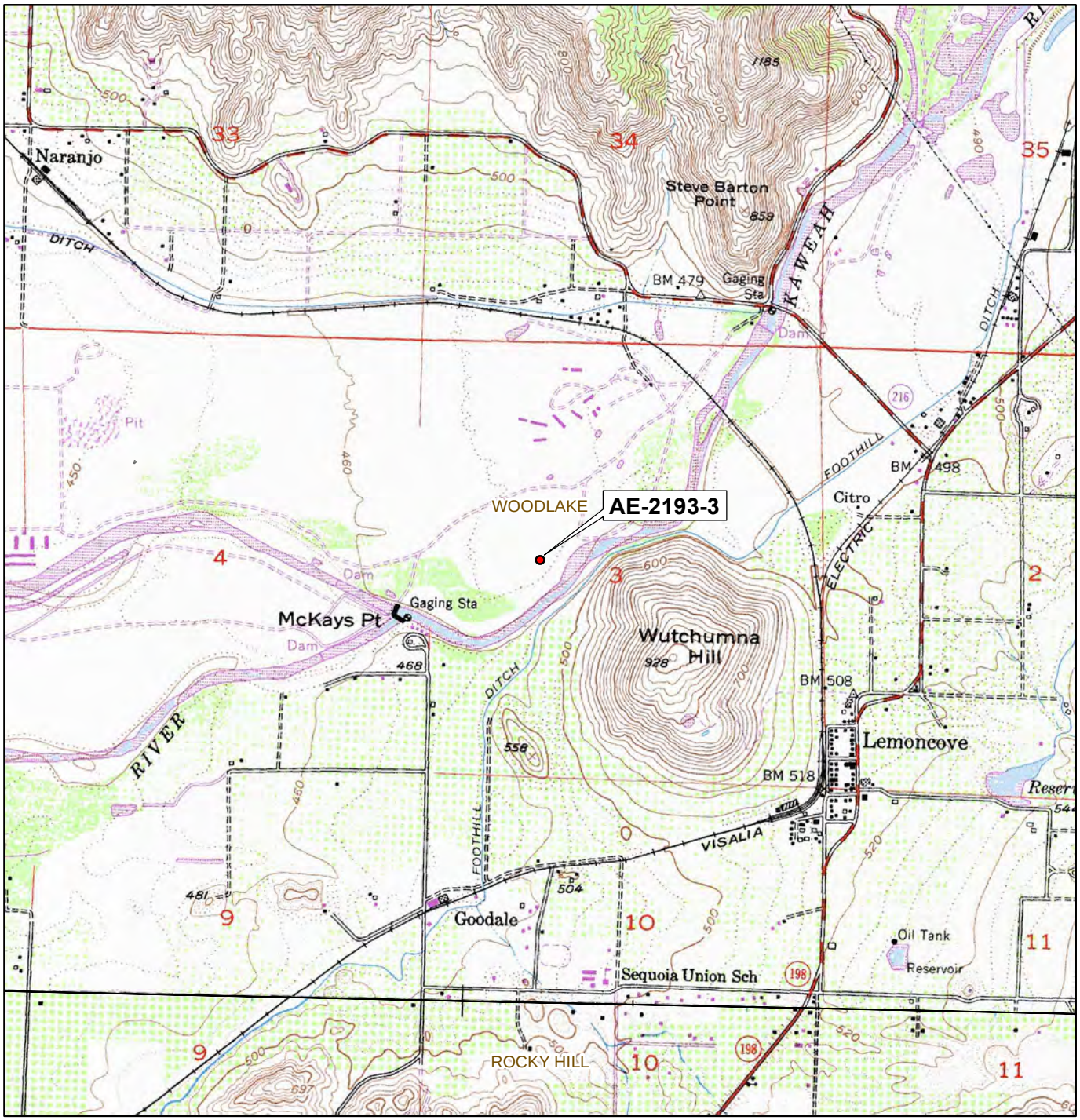
Trinomial

***Resource Name or #:** AE-2193-3

***Scale:** 1:24,000

***Map Name:** Woodlake, CA USGS 7.5' quadrangle

***Date:** 1952 (1969)



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TRUE NORTH

APPENDIX E-2

Paleontological Resource Assessment for the McKay Point Reservoir Project
(Applied EarthWorks, Inc., 2014)

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Paleontological Resource Assessment for the McKay Point Reservoir Project, Tulare County, California

Heather L. Clifford and Jessica L. DeBusk

Prepared By

Applied EarthWorks, Inc.
133 North San Gabriel Boulevard, Suite 201
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Submitted To
Sespe Consulting, Inc.
468 Poli Street, Suite 2E.
Ventura, CA 93001

March 2014

SUMMARY OF FINDINGS

At the request of Sespe Consulting, Inc., on behalf of the Tulare Irrigation District (TID), Applied EarthWorks Inc. (Æ) performed a paleontological resource assessment for the McKay Point Reservoir Project (Project) located in Tulare County, California. The Project proposes to construct a water storage/reregulation facility on 168 acres in Tulare County along the Kaweah River, approximately 3 miles downstream from the Terminus Dam and Lake Kaweah. The study consisted of a museum records search and a comprehensive literature and geologic map review. This report summarizes the methods and results of a paleontological resource assessment and provides Project-specific management recommendations.

This assessment included a comprehensive review of published and unpublished literature and museum collections records maintained by the Natural History Museum of Los Angeles County (LACM) and the University of California Museum of Paleontology (UCMP). The purpose of the literature review and museum records search was to identify the geologic units underlying the Project area and to determine whether or not previously recorded paleontological localities occur either within the Project boundaries or within the same geologic units elsewhere. Using the results of museum records search and literature review, the paleontological resource potential of the Project area was determined in accordance to Society of Vertebrate Paleontology guidelines.

Published geologic mapping indicates that the Project area is immediately underlain by Late Pleistocene Modesto Formation and underlain at depth by the Middle Pleistocene Riverbank Formation. Museum records found no previously recorded paleontological localities directly within Project boundaries; however, two vertebrate fossil localities yielding *Mammuthus* (mammoth) and *Equus* (horse) have been documented near the Project area within the Riverbank Formation. Additionally, the UCMP and LACM records indicate that at least 14 vertebrate fossil specimens from 12 localities have been recovered from within unnamed Pleistocene deposits within Tulare County. Finally, numerous fossil specimens representing plants, mammals, reptiles, and birds have been reported from within the Modesto and Riverbank Formations throughout the Central Valley.

As a result of this study, the geologic units underlying the Project area are determined to have a paleontological resource potential (i.e., sensitivity) ranging from low to high. The Late Pleistocene age Modesto Formation has a high potential to contain intact paleontological resources because it has been proven to yield significant vertebrate fossils in the vicinity of the Project area and elsewhere in the San Joaquin Valley. However, because these deposits are likely overlain by recent fluvial sedimentation at the surface, their paleontological sensitivity is low at the surface and increases with depth. Additionally, the Riverbank Formation has a high paleontological resource potential and underlies the Project area at depth.

The Project area is underlain by undisturbed geologic units with a proven potential to yield significant paleontological resources, and the likelihood of impacting vertebrate fossils during construction is high. Therefore, paleontological resource mitigation monitoring during Project construction is recommended. In addition, prior to the start of construction all field personnel

should receive a worker's environmental training module on paleontological resources. By implementing these mitigation measures during Project development, adverse impacts to paleontological resources can be reduced to a less than significant level pursuant to the requirements of the California Environmental Quality Act.

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1
INTRODUCTION

At the request of Sespe Consulting, Inc., on behalf of the Tulare Irrigation District (TID), Applied EarthWorks Inc. (*Æ*) performed a paleontological resource assessment for the McKay Point Reservoir Project (Project) approximately 20 miles northeast of Visalia in Tulare County, California (Figure 1-1). The study consisted of a museum records search and a comprehensive literature and geologic map review. This report summarizes the methods and results of the assessment and provides Project-specific management recommendations.

1.1 PROJECT LOCATION AND DESCRIPTION

TID proposes to construct a water storage/reregulation facility (Project) on approximately 168 acres in Tulare County (County). The water storage/reregulation facility will be constructed through the excavation and processing of aggregate (rock, sand, and gravel) by CEMEX, an aggregate mining company under contract with the TID, using existing facilities located adjacent to the Project area. Excavation will reach a maximum depth of 60 feet. The Project area and the existing CEMEX aggregate processing facility are on the north side of the divergence of the Kaweah and St. Johns Rivers near McKay Point (Figure 1-2). TID will be the Lead Agency for purposes of compliance with the California Environmental Quality Act (CEQA). Tulare County will serve as Lead Agency under the Surface Mining and Reclamation Act (SMARA) and, as such, the Project will be required to obtain County approval of a Surface Mining Permit for a SMARA-compliant Reclamation Plan and Financial Assurance Cost Estimate.

1.2 PURPOSE OF INVESTIGATION

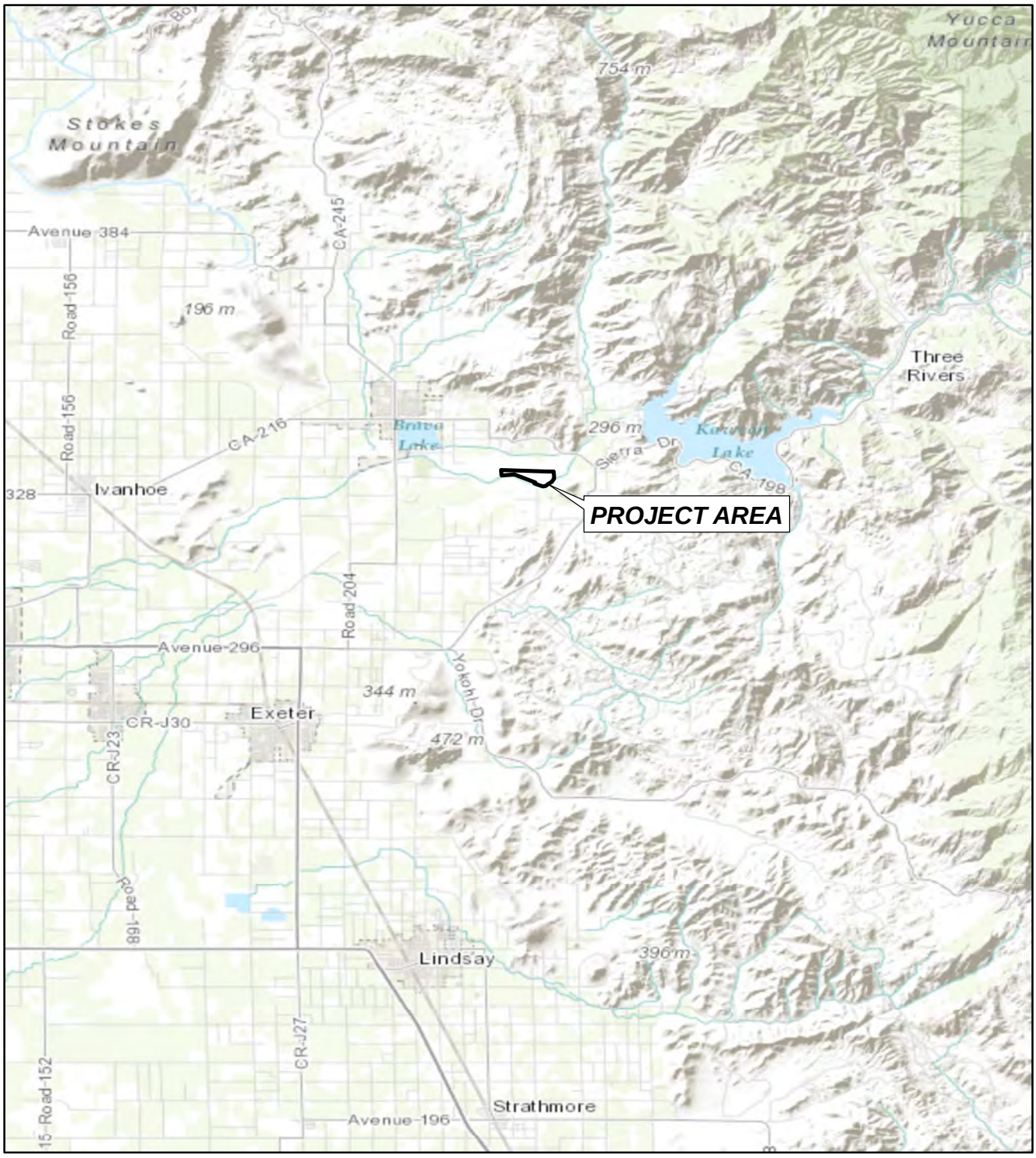
The purpose of this paleontological resource assessment is to: (1) identify the geologic units within the Project area, (2) assess their paleontological resource potential (i.e., "sensitivity"), (3) evaluate whether or not the Project has the potential to adversely impact scientifically significant paleontological resources, and (4) provide Project-specific mitigation measures to be implemented during Project development (as necessary). This assessment was performed to satisfy the requirements of the California Environmental Quality Act (CEQA) and was conducted in accordance with professional standards and guidelines set forth by the Society of Vertebrate Paleontology (SVP 2010).

1.3 REPORT ORGANIZATION

This report documents the results of *Æ*'s paleontological resource assessment of the Project area.

- Chapter 1 has introduced the scope of work, identified the Project location, described the Project, and defined the purpose of the investigation;
- Chapter 2 outlines the regulatory framework governing the Project;

- Chapter 3 presents the paleontological resources guidelines and professional standards used for this assessment;
- Chapter 4 presents the methods;
- the geology and paleontology of the Project area is presented in Chapter 5;
- the analysis and results of the assessment are presented in Chapter 6.
- Chapter 7 presents conclusions;
- Management recommendations in Chapter 8; and
- References cited are listed in Chapter 9.





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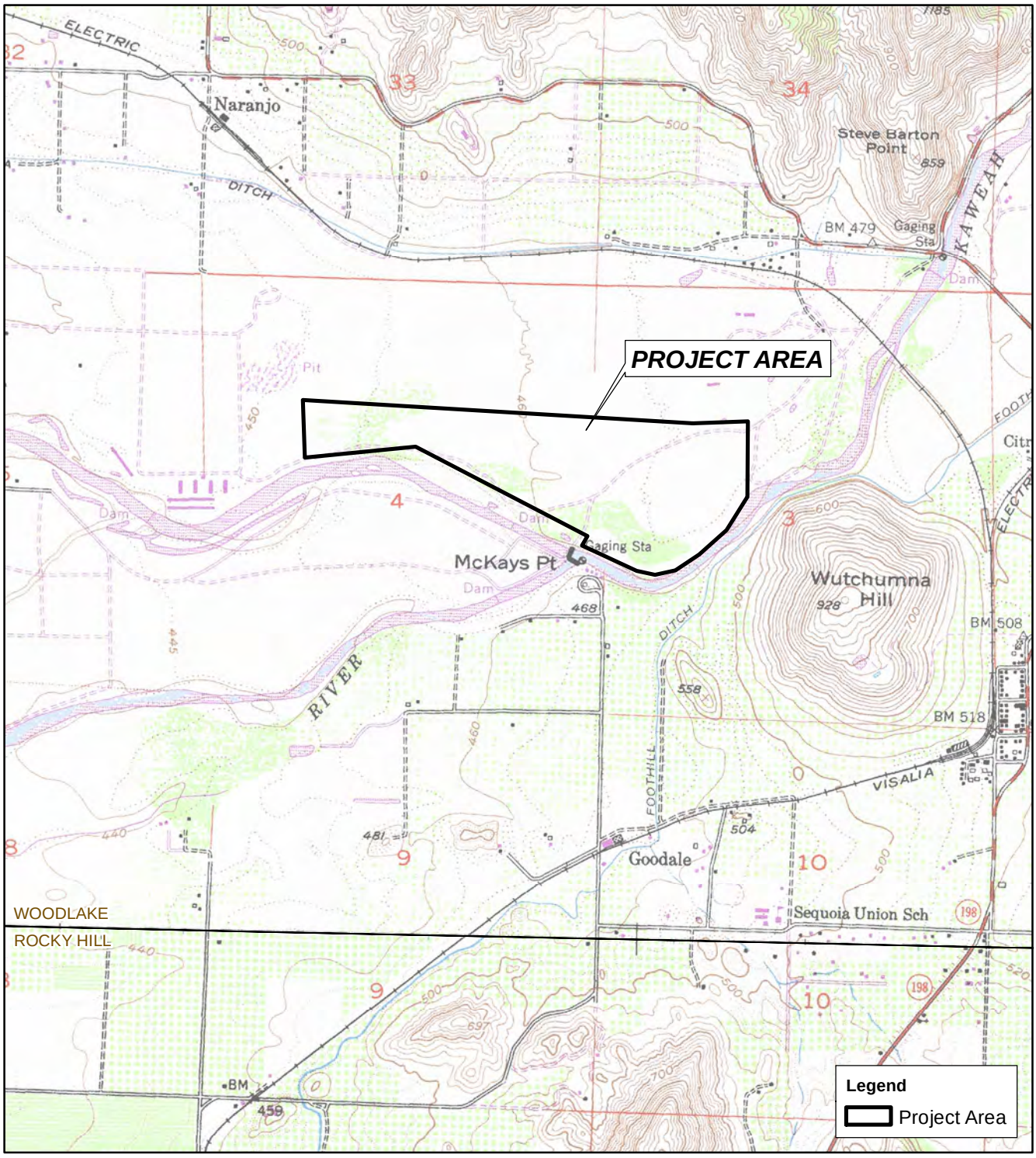
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Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri

Figure 1-1 Project area in Tulare County, California.



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Township 18S/Range 27E, Sections 3 and 4, MDB&M
Rocky Hill and Woodlake, CA 7.5' USGS Quadrangles

Figure 1-2 Project location on U.S. Geological Survey Woodlake 7.5-minute quadrangle.

2
REGULATORY FRAMEWORK

Paleontological resources (i.e., fossils) are considered nonrenewable scientific resources because once destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under the various federal, state, and local laws and regulations discussed in this chapter.

2.1 FEDERAL

Paleontological resources are afforded protection under numerous federal laws and regulations, including the National Environmental Policy Act of 1969, the American Antiquities Act of 1906, the Federal Land Policy and Management Act of 1976, Title 43 of the Code of Federal Regulations, and the Paleontological Resources Preservation Act (PRPA). The PRPA was recently enacted as a result of the passage of the Omnibus Public Lands Management Act of 2009 and requires federal land management agencies to manage and protect paleontological resources, affirming the authority of existing policies already in place. Federal laws and regulations would only apply to the Project if it is located on federal lands or if the Project receives federal funding. This Project is not located on federal lands and will not receive federal funding.

2.2 STATE

Paleontological resources cannot be replaced once they are destroyed. Therefore, paleontological resources are considered nonrenewable scientific resources and are protected under the CEQA. Specifically, in Section V(c) of Appendix G of the CEQA Guidelines, the "Environmental Checklist Form," the question is posed: "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" In order to determine the uniqueness of a given paleontological resource, it must first be identified or recovered (i.e., salvaged). Therefore, mitigation of adverse impacts to paleontological resources is mandated by CEQA.

2.3 LOCAL

Tulare County does not have mitigation requirements that specifically address potential adverse impacts to paleontological resources.

2.4 PROFESSIONAL STANDARDS

Absent specific agency guidelines, most professional paleontologists in California adhere to guidelines set forth by SVP in "Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources" (Society of Vertebrate Paleontology [SVP] 2010). The guidelines establish detailed protocols for the assessment of the paleontological resource potential of a project area and outline measures to mitigate adverse impacts to known or unknown fossil resources during project development. In order to prevent project delays, SVP highly recommends that project developers retain a qualified professional paleontologist in the

advance planning phases of a project to conduct an assessment and to implement paleontological mitigation prior to or during construction, as necessary. A qualified professional paleontologist is defined by SVP as "a practicing scientist who is recognized in the paleontological community as a professional and can demonstrate familiarity and proficiency with paleontology in a stratigraphic context."

Prior to the development phase of a project, SVP provides standard procedures to ensure an adequate paleontological resource assessment. These standard procedures apply to project areas underlain by geologic units determined to have a high, low, and undetermined paleontological sensitivity. The protocols and procedures for a standard paleontological resources assessment include the following elements: (1) literature search, (2) records search, (3) consultation with others, (4) field survey, (5) reporting, (6) agency confirmation, (7) repository agreement, and (8) pre-excavation meeting.

3
PALEONTOLOGICAL RESOURCE ASSESSMENT GUIDELINES

3.1 DEFINITION OF PALEONTOLOGICAL RESOURCES AND SIGNIFICANCE CRITERIA

Paleontological resources are the evidence of once-living organisms as preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (trackways, imprints, burrows, etc.). In general, fossils are considered to be greater than 5,000 years old (older than Middle Holocene) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks formed under certain conditions (SVP 2010).

Significant paleontological resources are defined as "identifiable" vertebrate fossils, uncommon invertebrate, plant, and trace fossils that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, or biochronological data (SVP 2010). These data are important because they are used to examine evolutionary relationships, provide insight on the development of and interaction between biological communities, establish time scales for geologic studies, and for many other scientific purposes (Scott and Springer 2003; SVP 2010).

3.2 PROFESSIONAL STANDARDS AND PALEONTOLOGICAL RESOURCE SENSITIVITY

Absent specific agency guidelines, most professional paleontologists in California adhere to guidelines set forth by SVP in "Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources" (SVP 2010). These guidelines establish detailed protocols for the assessment of the paleontological resource potential (i.e., "sensitivity") of a project area and outline measures to follow in order to mitigate adverse impacts to known or unknown fossil resources during project development. In order to prevent project delays, SVP highly recommends that the owner or developer retain a qualified professional paleontologist in the advance planning phases of a project to conduct an assessment and to implement paleontological mitigation during construction, as necessary.

Using baseline information gathered during a paleontological resource assessment, the paleontological resource potential of the geologic unit(s) (or members thereof) underlying a Project area can be assigned to one of four categories defined by SVP (2010). These categories include high, undetermined, low and no potential. The criteria for each sensitivity classification, and the corresponding mitigation recommendations, are summarized in Table 3-1 below.

If a project area is determined to have high or undetermined potential for paleontological resources following the initial assessment, then SVP recommends that a paleontological resources mitigation plan be developed and implemented during the construction phase of a project. The mitigation plan describes, in detail, when and where paleontological monitoring will take place and establishes communication protocols to be followed in the event that an unanticipated fossil discovery is made during project development. If significant fossil resources

are known to occur within the boundaries of the project and have not been collected, then the plan will outline the procedures to be followed prior to the commencement of construction (i.e., pre-construction salvage efforts or avoidance measures including fencing off a locality). Should microfossils be known to occur in the geologic unit(s) underlying the Project area or suspected to occur, then the plan will describe the methodology for matrix sampling and screening.

Table 3-1
Paleontological Sensitivity Categories

Resource Potential	Criteria	Mitigation Recommendations
No Potential	Rock units that are formed under or exposed to immense heat and pressure, such as high-grade metamorphic rocks and plutonic igneous rocks.	No mitigation required.
Low Potential	Rocks units that have yielded few fossils in the past, based upon review of available literature and museum collections records. Geologic units of low potential also include those that yield fossils only on rare occasion and under unusual circumstances.	Mitigation is not typically required.
Undetermined Potential	In some cases, available literature on a particular geologic unit will be scarce and a determination of whether or not it is fossiliferous or potentially fossiliferous will be difficult to make. Under these circumstances, further study is needed to determine the unit's paleontological resource potential (i.e., field survey).	A field survey is required to further assess the unit's paleontological potential.
High Potential	Geologic units with high potential for paleontological resources are those that have proven to yield vertebrate or significant invertebrate, plant or trace fossils in the past or are likely to contain new vertebrate materials, traces, or trackways. Rock units with high potential also may include those that contain datable organic remains older than late Holocene (e.g., animal nests or middens).	Typically, a field survey as well as onsite construction monitoring will be required. Any significant specimens discovered will need to be prepared, identified, and curated into a museum. A final report documenting the significance of the finds will also be required.

Adapted from SVP (2010).

The paleontological mitigation plan should be prepared by a qualified professional paleontologist and developed using the results of the initial paleontological assessment and survey. Elements of the plan can be adjusted throughout the course of a project as new information is gathered and conditions change, so long as the lead agency is consulted and all parties are in agreement. For example, if after 50 percent of earth disturbing activities have occurred in a particular unit or area, and no fossils whatsoever have been discovered, then the project paleontologist can reduce or eliminate monitoring efforts in that unit or area.

4
METHODS

4.1 LITERATURE REVIEW AND RECORDS SEARCH

Paleontological resources are not found in "soil" but are contained within the geologic deposits or bedrock that underlies the soil layer. Therefore, in order to ascertain whether or not a particular project area has the potential to contain significant fossil resources at the subsurface, it is necessary to review relevant scientific literature and geologic mapping to determine the underlying geology and stratigraphy of the area. Further, to delineate the boundaries of an area of paleontological sensitivity it is necessary to determine the extent of the entire geologic unit, because paleontological sensitivity is not limited to surface exposures of fossil material.

To determine whether or not fossil localities have been previously discovered within the project area or a particular rock unit, a search of pertinent local and regional museum repositories for paleontological localities within and nearby the project area should be performed. For this Project, a museum records search was conducted at the Natural History Museum of Los Angeles County (LACM). The museum records search was supplemented by a review of the University of California Museum of Paleontology's (UCMP) online database, which contains additional paleontological records for Tulare County.

4.2 KEY PERSONNEL

Æ's Paleontology Program Manager Jessica DeBusk served as Senior Paleontologist, requested the museum records search, and provided a quality control (QC) review of this report. Staff Paleontologist Heather Clifford conducted the literature and geologic map review and served as the primary author of this report. DeBusk has more than 10 years of professional experience as a consulting paleontologist and meets the SVP's definition of a qualified professional paleontologist. Geographic Information Systems (GIS) Specialist Michael Mirro produced all graphics.

5
GEOLOGY AND PALEONTOLOGY

5.1 REGIONAL GEOLOGY

The Project area is located on the eastern margin of the San Joaquin Valley within the Great Valley (also referred to as the Central Valley) geomorphic province of California. A geomorphic province is a region of unique topography and geology that is readily distinguished from other regions based on its landforms and diastrophic history (Norris and Webb 1990). The Great Valley is a north-northwest-trending asymmetric structural trough bisected by the Stockton Arch, a structural feature that subdivides the region into the Sacramento Valley in the north and the San Joaquin Valley to the south. The Great Valley is roughly 400 miles long and 50 miles wide and was once covered by marine waters as far back as the Jurassic (201–145 million years ago [Ma]) and into the Paleogene (66–23 Ma). Deposition into the Great Valley began during the Late Jurassic (164 Ma) as the paleo-Sierra Nevada began to rise and deliver eroded sediments to the lowlands. Forearc (i.e., the deep marine region between a volcanic arc and the associated subduction zone) marine and nonmarine shale, sandstone, and conglomerate of the Cretaceous Central Valley Sequence were deposited during this time unconformably on top of the Franciscan Complex of the Coast Range and the Sierran Batholith (Bartow and Nilsen 1990). During the late Mesozoic and much of the Cenozoic (66 Ma to the present), the actively subsiding region persisted as a submerged lowland basin, known as the Great Valley Sea (Harden 1998).

By the Pliocene (5.3–2.6 Ma), most of the marine waters in the Great Valley were drained and brackish and freshwater lakes remained (Weissmann et al. 2005). The present surface of the valley floor is composed of mostly unconsolidated Pleistocene age (2.6 Ma to 11,700 years before present [B.P.]), alluvial sediments associated with the drainage of the glaciated Sierra Nevada, alluvial deposits originating from the Coast Ranges, and recent sediments largely representing the alluvial, flood, and delta plains of the Sacramento and San Joaquin Rivers (Bartow 1991; Matthews and Burnett 1965; Norris and Webb 1990; Weissmann et al. 2005). The east side of the valley in the vicinity of the Project is characterized by a broad plain of low relief consisting of large coalescing alluvial fans (e.g., the Kaweah River Fan) derived from streams flowing from the Sierra Nevada (Weissmann et al. 2005).

5.2 GEOLOGY AND PALEONTOLOGY OF THE PROJECT AREA

Published geologic mapping of the region indicates that the Project area is underlain by the Modesto Formation (Qf) of Pleistocene age (Matthews and Burnett 1965) (Figure 5-1). The Riverbank Formation is exposed in the vicinity of the Project area and likely underlies the Modesto Formation at an unknown depth. The Project area is adjacent to the Kaweah River and is located on a large convex bank immediately north of a meander bend. It is likely, although not explicitly mapped, that the Project area is immediately underlain by recent channel and floodplain deposits of the Kaweah River, which conformably overlie the Modesto Formation. The depth of the recent Kaweah River deposits in the vicinity of the Project area are estimated to be relatively shallow (2–5 feet) due to the degradational nature of the stream and sediment trapping in the upstream Terminus Reservoir Dam (Berryman and Elasser 1966).

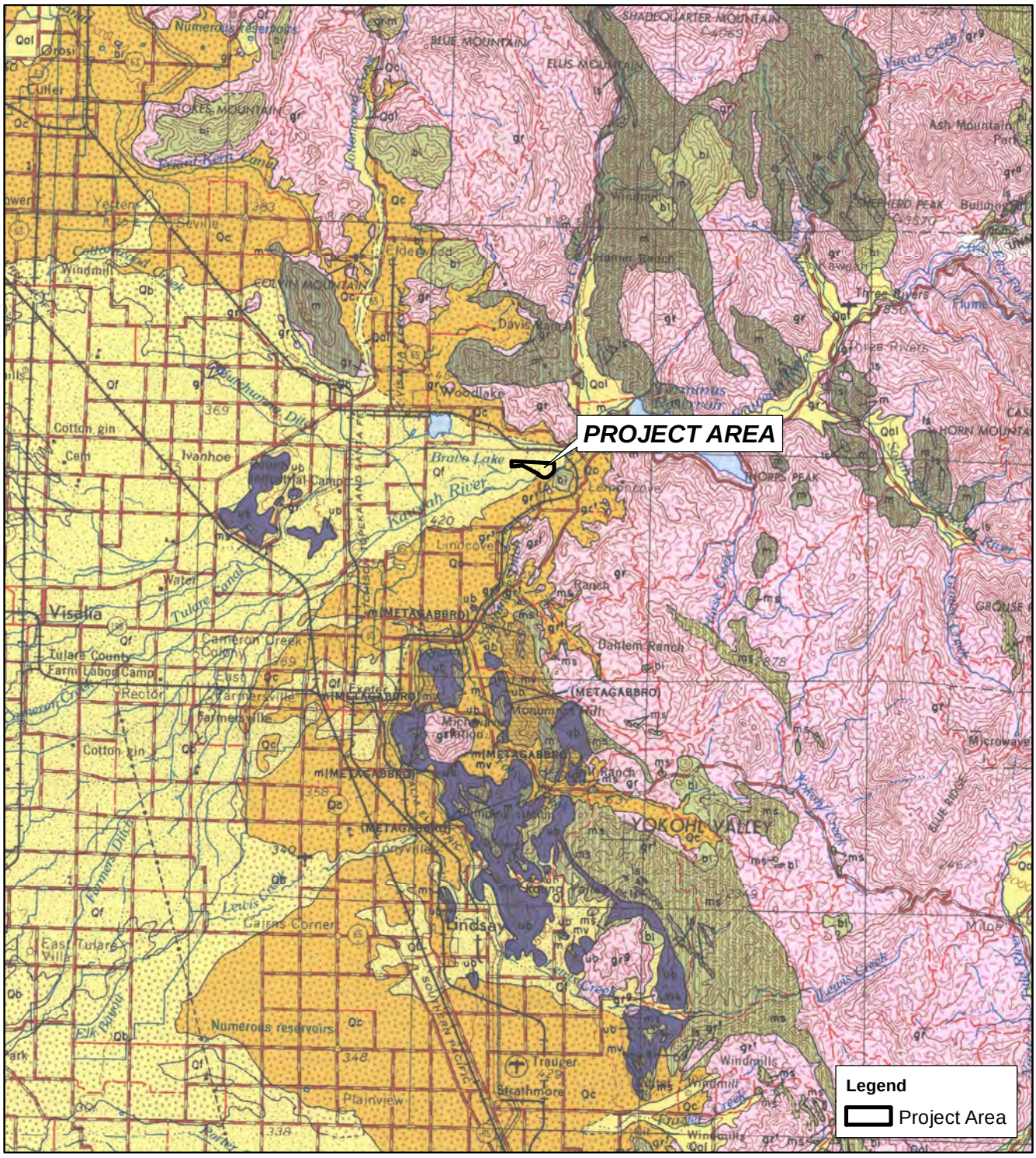


Figure 5-1 Geology in the vicinity of the Project area.

In the vicinity of the Project area, the gently sloping San Joaquin Valley floor rises toward the northeast, reaching an elevation of 600–800 feet above sea level. The local geomorphology is relatively flat but also consists of minor topographic relief derived from flooding and fluvial processes, including terraces and sloughs. In general, the soils are sandy, permeable, and fertile but may consist of hardpan in some areas (Croft and Gordon 1968).

5.2.1 The Modesto Formation

The Modesto Formation is Late Pleistocene in age and consists of poorly indurated fluvial and alluvial deposits and well-developed soils (Davis and Hall 1959; Marchand and Allwardt 1981). The sediments consist of andesitic to arkosic granitic sand, silt, and gravel, which drained from the Sierra Nevada during the Late Pleistocene Wisconsin glaciations (Weissmann et al. 2002). The Modesto Formation extends from the Sacramento River in the north to the Tule River in the south (Matthews and Burnett 1965). It is locally overlain by Holocene alluvial sediments and is unconformably underlain by the middle Pleistocene Riverbank Formation. The Modesto Formation was first described by Davis and Hall (1959) and later redescribed by Marchand (1977) at its type section located at a roadcut near the Mitchell Road Bridge above the Tuolumne River in the town of Ceres, California. Marchand (1977) informally divides the Modesto Formation into a lower and upper member based on topographic expression and the presence of paleosols (i.e., buried soil horizons). The upper member has a maximum thickness of 30 feet and the lower member is up to 70 feet thick (Marchand and Allwardt 1981). The upper member is composed of massive to well-bedded sand, silt, and clay, with subordinate gravel deposits. Where stratification is absent, the sedimentary structures were most likely destroyed by soil development. The lower member is predominately composed of moderately stratified sand and silt deposits, with localized lenticular cross-lamination. The base of lower member of the Modesto Formation is marked by a distinct layer of red clay (Hudson 1960). The total thickness of the Modesto Formation ranges from 50 to 100 feet and its age is estimated to range from 9000 to 42,000 B.P. (Marchand 1977). These depths are characteristic of the Modesto Formation near its type section in the center of the San Joaquin Valley where sediment accumulation has been significant. Adjacent to the Sierran foothills, in the vicinity of the Project area, basement rock is closer to the surface and sediment accumulation is most likely more shallow. Therefore, the thickness of the Modesto Formation in the Project area is unknown, but it is probably less than 50–100 feet thick. Because excavations associated with the Project will be up to 60 feet deep, it is necessary to discuss the underlying Riverbank Formation.

5.2.2 The Riverbank Formation

The Riverbank Formation was deposited in the Middle Pleistocene and consists of granitic sand, silt, and clay primarily derived from the Sierra Nevada (Davis and Hall 1959). In the vicinity of the Project area in Tulare County, the Riverbank Formation is unconformably underlain by the Mesozoic granitic rocks (mapped as “gr” by Matthews and Burnett [1965]). The Riverbank Formation was first described by Davis and Hall (1959) and later redescribed by Marchand and Allwardt (1981) at its type section located on the banks of the Stanislaus River in the town of Riverbank. The Riverbank Formation consists of moderately consolidated deposits of massive to well-bedded silty sand, arkosic sand, pebbly sand, and gravel lenses. Locally, fine sand may exhibit aeolian sorting and coarse sand and gravel may be interbedded with silt and clay deposits (Marchand 1977). These sediments comprise older alluvium, dissected fan, and nonmarine sedimentary deposits in the San Joaquin Valley (Matthews and Burnett 1965; McLeod 2013;

Smith 1964). The thickness of the Riverbank Formation ranges from approximately 50 to 250 feet and it is estimated to range in age from 0.13–0.45 Ma (Marchand and Allwardt 1981).

5.2.3 Paleontology

At least 27 fossil specimens representing plants, mammals, and reptiles have been recovered from the Modesto Formation from various localities throughout the Central Valley (UCMP online database). In 2006, along the San Joaquin River Parkway trail near Friant and Rice Roads in Fresno, a large radius of *Bison* cf. *B. latifrons* was discovered eroding from the side of an outcrop (Dundas et al. 2009). The bison was deposited in the upper member of the Modesto Formation on the San Joaquin River alluvial fan. The bison radius was preserved in a fine-grained clay- and charcoal-rich floodplain deposit approximately 15–30 inches thick. Other terrestrial vertebrate fossils that have been discovered from within the Modesto Formation include *Megalonyx jeffersoni* (Jefferson's ground sloth), *Bison antiquus* (bison), *Mammuthus columbi* (mammoth), *Camelops* (camel), Serpentes (snakes), and Rodentia (rodents) (UCMP online database).

Hundreds of fossil specimens representing plants, mammals, reptiles, and birds have been recovered from the Riverbank Formation from various localities throughout the Central Valley (UCMP online database). During excavations associated with the construction of the Arco Arena in Sacramento, numerous terrestrial vertebrate fossils were discovered from within the Riverbank Formation, including Antilocapridae (antelope*), Bison antiquus* (bison), *Camelops hesternus* (camel), *Canis* cf. *latrans* (coyote), Cervidae (deer), *Mammuthus* (mammoth), *Paramylodon harlani* (Harlan's ground sloth), and *Sciurus* (squirrel). In addition, plant fossils were discovered at the same locality, including the seed of a *Prunus* cf. *ilicifolia* (holly leaf cherry). All fossil specimens were encountered between 13 and 30 feet below the valley surface and represent taxa that are typical of the Late Pleistocene (Hilton et al. 2000). Other paleontological localities within the Riverbank Formation yielded *Equus* (horse) as well as Aves (birds), *Canis dirus* (dire wolf), *Mammuthus columbi* (mammoth), *Neotoma* (packrat), *Orthodon* (blackfish), Proboscidea (elephantoid), *Scapanus latimanus* (broad-footed mole), *Thamnophis* (garter snake), and *Thomomys* (pocket gopher) from throughout the northern and central Great Valley. The depths below ground surface at which these discoveries were made is largely unreported (McLeod 2013; UCMP online database).

6
ANALYSIS AND RESULTS

6.1 MUSEUM RECORDS SEARCH RESULTS

A museum records search of the Project area was conducted by the LACM on December 17, 2013. The museum records search was supplemented by a review of the UCMP's online database, which contains paleontological records for Tulare County. The LACM reports that there are no previously recorded vertebrate fossil localities directly within the Project boundaries; however, museum collections records indicate that at least two vertebrate localities have been recovered nearby from within Riverbank Formation deposits, including a fossilized specimen of *Mammuthus* (mammoth) and *Equus* (horse) (McLeod 2013; Table 6-1). A supplemental review of online museum collections records maintained by the UCMP reveals that at least 12 vertebrate fossil specimens from 10 localities have been recovered from within unnamed Pleistocene deposits in Tulare County. These deposits, similar in age and depositional environment to the Modesto Formation and the Riverbank Formation, have yielded specimens of *Camelops* (camel), *Elephas* (elephant), *Equus* (horse), *Mammuthus columbi* (mammoth), and *Mammut americanum* (mastodon). One of those specimens was recovered from a locality (UCMP V5634) near the South Fork Kaweah River, upstream from the Project area (UCMP online database).

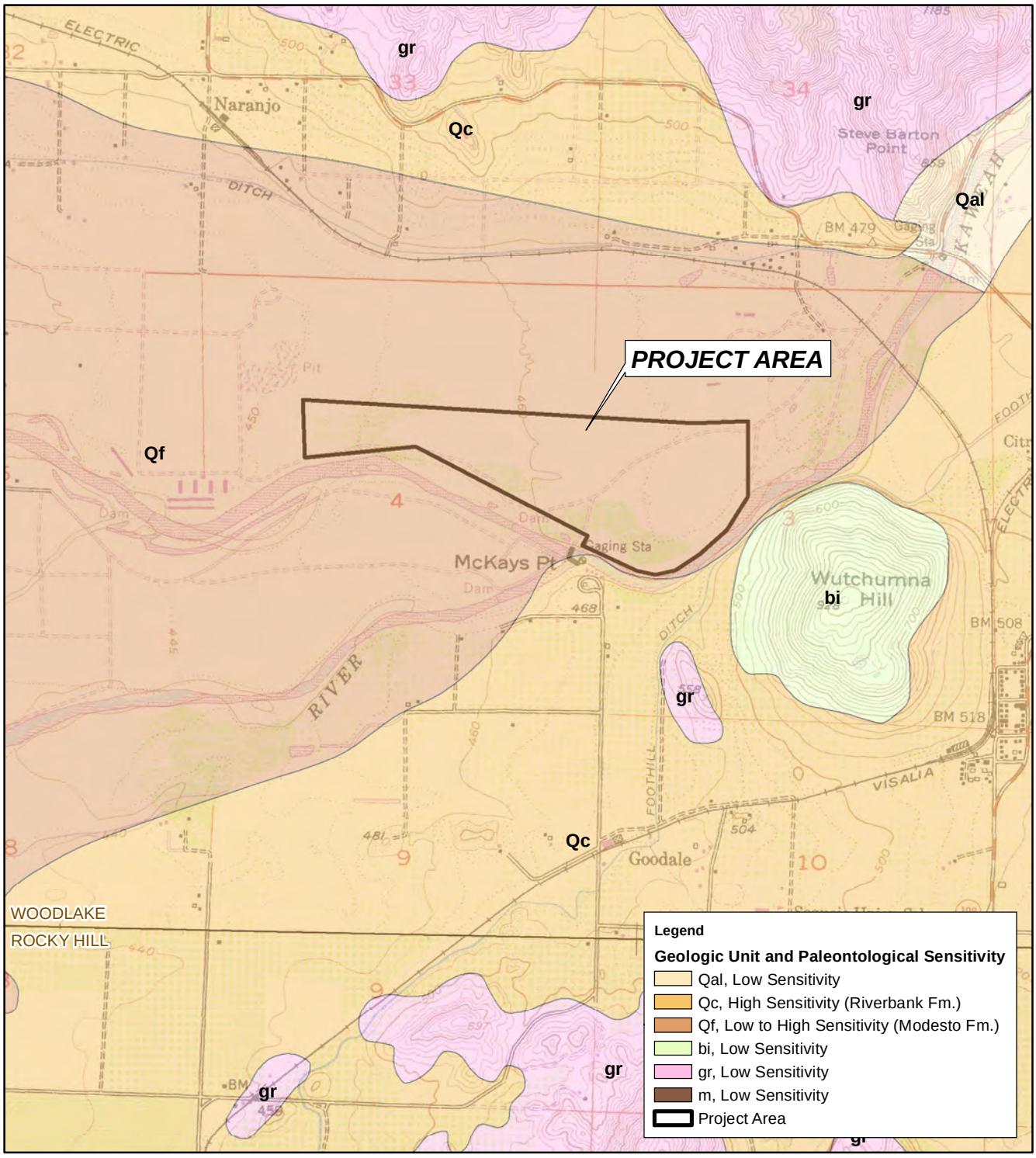
Table 6-1
Vertebrate Localities Reported in the Vicinity of the Project Area[a]

Locality No. and Approximate Location	Geologic Unit	Age	Taxa
LACM 4087; southeast of the Project area, east of Highway 65 and East of Terra Bella	Riverbank Formation	Pleistocene	*Mammuthus* (mammoth)
LACM 1156; south-southwest of the Project area just north of Delano	Riverbank Formation	Pleistocene	*Equus* (horse)

a - McLeod (2013).

6.2 DETERMINATION OF PALEONTOLOGICAL RESOURCE POTENTIAL FOR GEOLOGIC UNITS WITHIN THE PROJECT AREA

Based on the literature review and museum records search results, the geologic units underlying the Project area are determined to have a high paleontological sensitivity in accordance to criteria set forth by SVP (2010). The Pleistocene age Modesto Formation and the Riverbank Formation both have a high potential to contain intact paleontological resources because they have proven to yield significant vertebrate fossils throughout San Joaquin Valley (Figure 6-1). Therefore, further paleontological resource management will be required during Project development as discussed in Chapter 8.



SCALE 1:24,000

1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

Township 18S/Range 27E, Sections 3 and 4, MDB&M
Geologic Map of California: Fresno Sheet (Matthews and Burnett 1965)
Rocky Hill and Woodlake, CA 7.5' USGS Quadrangles

Figure 6-1 Geologic units and paleontological sensivity in the Project vicinity.

7
CONCLUSION

This assessment is based on the results of a museum records search and review of available geologic and paleontologic literature. Therefore, only fossils that have already been inventoried or collected are available for this analysis. In general, the potential for a given project to result in adverse impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project. Due to the substantial excavations planned for the construction of the Project, there is a relatively high potential for an unknown number of paleontological resources to be adversely impacted. However, by implementing the management recommendations outlined in the following chapter, including worker's environmental awareness training and on-site construction monitoring, adverse impacts to paleontological resources can be reduced to a less than significant level pursuant to the requirements of CEQA.

8
MANAGEMENT RECOMMENDATIONS

The following paleontological mitigation measures have been developed in accordance to SVP guidelines and if implemented, will satisfy the requirements of CEQA. These measures have been used by professional paleontologists for many years and have proven to be effective in reducing or eliminating adverse impacts to paleontological resources as a result of private and public development projects throughout California and elsewhere.

8.1 WORKER'S ENVIRONMENTAL AWARENESS TRAINING

Prior to the start of construction, all field personnel will receive a worker's environmental awareness training module on paleontological resources. The training will provide a description of the fossil resources that may be encountered in the Project area, outline steps to follow in the event that a fossil discovery is made, and provide contact information for the Project Paleontologist and onsite monitor(s). The training will be developed by the Project Paleontologist and may be conducted concurrent with other environmental training (e.g., cultural and natural resources awareness training, safety training, etc.). The training may also be videotaped or presented in an informational brochure for future use by field personnel not present at the start of the Project. Provisions in the Project monitoring plan (detailed below) should also provide for periodic "refresher" training of employees to ensure their skills and responsibilities are maintained at the necessary level.

8.2 PALEONTOLOGICAL MITIGATION MONITORING

Prior to the commencement of ground disturbing activities, a qualified professional paleontologist will be retained to prepare and implement a Paleontological Resource Mitigation Plan (PRMP) for the Project. Initially, full-time monitoring will be required in Project areas determined to have a high paleontological sensitivity (i.e., the Modesto Formation [Qf]) during all ground disturbing activities at a depth greater than 5 feet. Part-time monitoring or spot checking may be necessary during very shallow ground disturbances impacting only the uppermost soil layers in order to determine if underlying sensitive geologic deposits are being impacted by construction, and at what depth. If, after 50 percent of the excavations are completed, no fossil resources are encountered, monitoring efforts can be reduced or eliminated at the discretion of the Project Paleontologist. Finally, upon on-site observations, monitoring may also be terminated if the type of excavation, the equipment used, or the lithology of the Project area does not prove to be conducive to fossil preservation.

Monitoring methods will be specified in the PRMP but, in general, will entail the visual inspection of excavated or graded areas and trench sidewalls. In the event that a paleontological resource is discovered, the monitor will have the authority to temporarily divert the construction equipment around the find until it is assessed for scientific significance, and collected.

8.3 FOSSIL PREPARATION, CURATION, AND REPORTING

Upon completion of fieldwork, all significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Following laboratory work, all fossils specimens will be identified to the lowest taxonomic level, cataloged, analyzed, and delivered to an accredited museum repository for permanent curation and storage. The cost of curation is assessed by the repository and is the responsibility of the Project owner.

At the conclusion of laboratory work and museum curation, a final report will be prepared describing the results of the paleontological mitigation monitoring efforts associated with the Project. The report will include a summary of the field and laboratory methods, an overview of the Project area geology and paleontology, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to the designated museum repository.

9
REFERENCES CITED

Bartow, J. A.
1991 *The Cenozoic Evolution of the San Joaquin Valley, California.* U.S. Geological Survey Professional Paper 1501. Washington, D.C.

Bartow, J. A., and T. H., Nilsen
1990 *Review of the Great Valley Sequence, Eastern Diablo Range and Northern San Joaquin Valley, Central California.* U.S. Geological Survey Open-File Report 90-226. Menlo Park, California.

Berryman, Lorin E., and Albert B. Elasser
1966 *Terminus Reservoir: Geology, Paleontology, Flora & Fauna, Archeology, History.* Prepared under the Inter-Agency Archeological Salvage Program by the U.S. Army Corps of Engineers in cooperation with the National Park Service. Electronic document, http://www.nps.gov/history/history/online_books/smithsonian/terminus-reservoir/index.htm, accessed December 13, 2013.

Croft, M. G., and G. V. Gordon
1968 *Geology, Hydrology, and Quality of Water in the Hanford-Visalia Area, San Joaquin Valley, California.* U.S. Geological Survey, Open-File Report OF-68-67, Scale 1:125,000.

Davis, S. N., and F. R. Hall
1959 *Water Quality of Eastern Stanislaus and Northern Merced Counties, California.* Stanford University Publications in Geological Science (6)1.

Harden, D. R.
1998 *California Geology.* Prentice Hall, New Jersey.

Mathews, R. A., and J. L. Burnett
1965 *Geologic Map of California: Fresno Sheet.* California Division of Mines and Geology, Scale: 1:250,000.

Marchand, Denis E.
1977 Late Cenozoic Stratigraphic Units, The Cenozoic History of the San Joaquin Valley and Adjacent Sierra Nevada as Inferred from the Geology and Soils of the Eastern San Joaquin Valley. In *Soil Development, Geomorphology and Cenozoic History of the Northeastern San Joaquin Valley and Adjacent Areas, California*, edited by M. J. Singer, pp. 39–50. American Society of Agronomy, Geological Society of America, Soil Sciences Society of America, Joint Field Section 1977, Guidebook. University of California Press, Davis.

Marchand, Denis E., and Alan Allwardt
1981 *Late Cenozoic Stratigraphic Units, Northeastern San Joaquin Valley, California.* U.S. Geological Survey Bulletin 1470.

McLeod, S. A.
2013 Unpublished museum collections records. Natural History Museum of Los Angeles County.

Norris, Robert M., and Robert W. Webb
1990 *Geology of California*. John Wiley & Sons, New York.

Scott, E., and K. Springer
2003 CEQA and Fossil Preservation in California, The Environmental Monitor, Published by the Association of Environmental Professionals, Fall 2003.

Society of Vertebrate Paleontology (SVP)
2010 Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.

Weissmann, G. S., G. L. Bennett, and A. L. Lansdale
2005 Factors Controlling Sequence Development on Quaternary Fluvial Fans, San Joaquin Basin, California, U.S.A. In *Alluvial Fans: Geomorphology, Sedimentology, Dynamics*, by A. Harvey, A. Mather, and M. Stokes, pp. 169–186. Geological Society of London Special Publication 251.

APPENDIX E-3

Log of Native American Outreach

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Big Sandy Rancheria of Western Mono Indians
Attn: Elizabeth D. Kipp
P.O. Box 337
Auberry, CA 93602

Dunlap Band of Mono Indians
Attn: Benjamin Charley Jr.
P.O. Box 14
Dunlap, CA 93621

Dunlap Band of Mono Indians
Attn: Dirk Charley
5509 E. McKenzie Avenue
Fresno, CA 93727

Kern Valley Indian Community – Kawaiisu Tubatulabal
Attn: Julie Turner
P.O. Box 1010
Lake Isabella, CA 93240

Kern Valley Indian Community – Kawaiisu Tubatulabal
Attn: Robert Robinson
P.O. Box 1010
Lake Isabella, CA 93240

Kern Valley Indian Community – Kawaiisu Tubatulabal
Attn: Brandy Kendricks
30741 Fox Ridge Court
Tehachapi, CA 93561

Santa Rosa Rancheria Tachi Yokut Tribe
Attn: Leo Sisco
P.O. Box 8
Lemoore, CA 93245

Tubatulabals of Kern Valley
Attn: Robert L. Gomez, Jr.
P.O. Box 226
Lake Isabella, CA 93240

Tule River Indian Tribe
Attn: Neil Peyron
P.O. Box 589
Porterville, CA 93258

Wuksache Indian Tribe/Eshom Valley Band
Attn: Kenneth Woodrow
1179 Rock Haven Court
Salinas, CA 93906

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Big Sandy Rancheria of Western Mono Indians
Elizabeth D. Kipp, Chairperson
PO Box 337
Auberry, CA 93602

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Ms. Kipp,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Constructing the reservoir in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet.
- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.
- Provide additional storage capacity for storm water layoff and flood prevention.

- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCA to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

US Post: Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

E-mail: mrohr@sespe.com and gstephens@sespe.com (Graham Stephens)

If you need further assistance or have any questions, please feel free to contact Maya Rohr or Graham Stephens by phone at (805) 275-1515.

If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Kern Valley Indian Community – Kawaiisu Tubatulabal
Brandy Kendricks
30741 Fox Ridge Court
Tehachapi, CA 93561

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Brandy Kendricks,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
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A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

US Post: Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

E-mail: mrohr@sespe.com and gstephens@sespe.com (Graham Stephens)

If you need further assistance or have any questions, please feel free to contact Maya Rohr or Graham Stephens by phone at (805) 275-1515.

If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Dunlap Band of Mono Indians
Benjamin Charley Jr., Tribal Chair
PO Box 14
Dunlap, CA 93621

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Benjamin Charley Jr.,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Constructing the reservoir in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
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- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.
- Provide additional storage capacity for storm water layoff and flood prevention.

- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCA to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

US Post: Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Santa Rosa Rancheria Tachi Yokut Tribe
Leo Sisco, Chairperson
PO Box 8
Lemoore, CA 93245

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Leo Sisco,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
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- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCA to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

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Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Dunlap Band of Mono Indians
Dirk Charley, Tribal Secretary
5509 E. McKenzie Avenue
Fresno, CA 93727

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Dirk Charley,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

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PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

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The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

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The Owners' objectives in proposing the Project include the following:

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A detailed Project Description is attached to this letter.

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REQUEST FOR CONSULTATION

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Tubatulabals of Kern Valley
Robert L. Gomez, Jr., Tribal Chairperson
PO Box 226
Lake Isabella, CA 93240

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Robert L. Gomez, Jr.,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

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PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

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- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Constructing the reservoir in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet.
- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.
- Provide additional storage capacity for storm water layoff and flood prevention.

- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCA to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

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Project Manager
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3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

E-mail: mrohr@sespe.com and gstephens@sespe.com (Graham Stephens)

If you need further assistance or have any questions, please feel free to contact Maya Rohr or Graham Stephens by phone at (805) 275-1515.

If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Kern Valley Indian Community – Kawaiisu Tubatulabal
Julie Turner, Secretary
PO Box 1010
Lake Isabella, CA 93240

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Julie Turner,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
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A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

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If you need further assistance or have any questions, please feel free to contact Maya Rohr or Graham Stephens by phone at (805) 275-1515.

If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Tule River Indian Tribe
Neil Peyron, Chairperson
PO Box 589
Porterville, CA 93258

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Neil Peyron,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

The proposed Project is located on approximately 500 acres adjacent to the Lower Kaweah River and St. Johns River. In accordance with CEQA (Pub. Resources Code, § 21000 et seq.), the Tulare Irrigation District will be preparing an Environmental Impact Report (EIR) to evaluate the environmental effects associated with the Project. A Notice of Preparation (NOP) under CEQA was published on October 2, 2020 and the distribution included the list of tribes provided by the Native American Heritage Commission (NAHC) at that time. A copy of the current Project Description is included with this notice and request for consultation.

PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
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A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

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If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

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TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Kern Valley Indian Community – Kawaiisu Tubatulabal
Robert Robinson, Chairperson
PO Box 1010
Lake Isabella, CA 93240

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Robert Robinson,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

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PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

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The Owners' objectives in proposing the Project include the following:

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REQUEST FOR CONSULTATION

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If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

TULARE IRRIGATION DISTRICT
6826 Avenue 240 ▪ Tulare, CA 93274
Phone Number: (559) 686-3425 Fax Number: (559) 686-3673

Project Notification and Tribal Consultation Request Pursuant to AB 52

September 16, 2021

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Court
Salinas, CA 93906

RE: Project Notification and Consultation Request Pursuant to CEQA's Assembly Bill (AB) 52 for the McKay Point Reservoir Project (SCH No. 2014011078)

Dear Kenneth Woodrow,

Pursuant to the provisions of AB 52, as the lead agency under the California Environmental Quality Act (CEQA), the Tulare Irrigation District (TID) hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the McKay Point Reservoir Project (Project) in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American tribal cultural resources and/or tribal cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
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PROJECT INFORMATION/DESCRIPTION

Project Title: McKay Point Reservoir Project

Project Applicant: Project joint owners – Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC).

Assessor's Parcel Number(s): The Project site is comprised of portions of the following Assessor's Parcel Numbers (APN's): 113-070-016-000, 113-080-005-000, 113-080-008-000, 113-090-001-000, 113-100-002-000.

Project Location: Located in Tulare County, California, the Project site lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake (Figure 1). The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198, in Sections 3 and 4, Township 18 South, Range 27 East, Mount Diablo Base and Meridian.

The surrounding land uses in the vicinity of the Project are mining, agricultural, and residential. Mining operations exist to the north, northeast, southwest and west of the Project site, and the areas south and east of the Project site are used for agricultural and, to a limited extent, for rural residential purposes. The Project site has been extensively used and disturbed over the years for cattle grazing.

Project Background: TID is a public agency organized and existing pursuant to Division 11 of the California Water Code. CPDC and VKWC are mutual water companies organized and existing pursuant to Division 3 of the California Corporations Code. The Project Owners are all members of the Kaweah and St. Johns Waters Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. VKWC is also a mutual water company formed under Section 200 of the California Corporations Code. Together they are the Owners of the Project.

Project Summary: The Owners propose to construct a surface water storage and re-regulation reservoir (the proposed Project) on approximately 200 acres within the 500-acre McKay Point property. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners plan to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage / re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas (Figure 2).

The Project would result in new disturbance to the site. There would be surface disturbance of approximately 134 acres, this includes the proposed perimeter fencing which will be constructed such that it will not disrupt biological resources (i.e., migration routes), perimeter road for reservoir maintenance, and inlet/outlet channels between the rivers and the reservoir. The excavation of the site for construction of the reservoir would be within the approximately 134 acres, covering approximately 110 acres on the surface and approximately 60 feet deep below the existing ground surface (approximately to bedrock). The Project would not extend past the bedrock and no blasting would be required. The Project would include staff education and monitoring of the site to protect cultural, historical, tribal and paleontological resources. These protection measures will be discussed in detail in the Draft EIR.

Discretionary approvals would be required for the Project; therefore, the Project is subject to CEQA. The excavation of the Project site needed to construct the reservoir would require compliance with the State Mining and Reclamation Act (SMARA) and a Reclamation Plan approved by the County of Tulare. TID is the Project Applicant on behalf of the Owners as well as the CEQA Lead Agency.

The Owners' objectives in proposing the Project include the following:

- Capturing and re-regulating water made available to the Owners during flood releases from Lake Kaweah.
- Capturing and re-regulating water entitlements belonging to the Owners released from Lake Kaweah.
- Capturing and re-regulating any other water sources on the Kaweah River that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Constructing the reservoir in such a way that revenue can be obtained to offset a portion of the construction and development costs.
- Locating the reservoir adjacent to the Kaweah River to allow for off-stream access to surface water storage, thus minimizing the need for pipelines.

To accomplish these objectives, the Owners propose to construct and operate the Project to:

- Divert and receive water immediately upstream of the divergence of the Lower Kaweah River and St. Johns River, commonly referred to as McKay Point.
- Provide a water storage capacity of approximately 4,600 acre-feet.
- Deliver water back to either the Lower Kaweah River or the St. Johns River, as needed.
- Provide additional storage capacity for storm water layoff and flood prevention.

- Coordinate all such diversions and deliveries to and from the reservoir with the Kaweah Delta Conservation District and the Kaweah and St. Johns River Association.
- Enter into a lease agreement with WCA to excavate the site for the reservoir and process the excavated material into a marketable product (primarily construction grade aggregate). TID would receive revenue from the sale of the excavated material that could be used to offset a portion of the reservoir construction and development costs.

A detailed Project Description is attached to this letter.

Potential Environmental Effects: An EIR would be prepared to evaluate the proposed Project's environmental impacts and analyze Project alternatives. The topic areas anticipated to be analyzed in detail in the EIR include Air Quality, Greenhouse Gas Emissions, Health Risks, Biological Resources, Cultural Resources, Geology and Soil, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Tribal Cultural Resources, and Wildfire.

REQUEST FOR CONSULTATION

Pursuant to the provisions of AB 52, as the lead agency under CEQA, the Tulare Irrigation District hereby extends an invitation to consult on the CEQA review of the McKay Point Reservoir Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the Tulare Irrigation District on the review of this Project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be emailed or mailed to the following addresses (email is preferred):

US Post: Maya Rohr
Project Manager
Sespe Consulting, Inc.
3990 Old Town Avenue, Suite A203
San Diego, CA 92110

Phone: (805) 275-1515

E-mail: mrohr@sespe.com and gstephens@sespe.com (Graham Stephens)

If you need further assistance or have any questions, please feel free to contact Maya Rohr or Graham Stephens by phone at (805) 275-1515.

If the Tulare Irrigation District does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52.

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APPENDIX E-4

Addendum to Paleontological Resource Assessment
(Applied EarthWorks, Inc., 2021)

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Addendum to
Paleontological Resource Assessment for the
McKay Point Reservoir Project,
Tulare County, California

Melissa Macias

Prepared By

Applied EarthWorks, Inc.
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Prepared For
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Ventura, CA 93001

September 2021

Addendum to
Paleontological Resource Assessment for the
McKay Point Reservoir Project,
Tulare County, California

Written By: _____

Melissa Macias, M.S., Senior Paleontologist

Approved By: _____

Amy Ollendorf, Ph.D., M.S., RPA 12588
Paleontology Program Manager

September 2021

MANAGEMENT SUMMARY

At the request of Sespe Consulting, Inc., Applied EarthWorks, Inc. (Æ) completed an updated paleontological resource assessment (PRA) for the Tulare Irrigation District's McKay Point Reservoir Project in Tulare County, California (Project). The Project proposes to construct a water storage/reregulation facility on 194 acres in Tulare County along the Kaweah River, approximately 3 miles downstream from the Terminus Dam and Lake Kaweah. This PRA is written in partial satisfaction of requirements of the California Environmental Quality Act (CEQA), and Tulare Irrigation District is the Lead Agency for CEQA compliance.

Æ completed the original PRA for the Project in 2014. Meanwhile, some of the Project plans have been revised. Therefore, the present study addresses the updated Project plans through a new museum records search, comprehensive literature and geologic map reviews, and pedestrian survey. Using the results of museum records search and literature review, Æ determined the paleontological resource potential of the Project in accordance with Society of Vertebrate Paleontology guidelines. This report summarizes the methods and results of the PRA and provides Project-specific management recommendations.

Published geologic maps indicate the late Pleistocene Modesto Formation and underlying middle Pleistocene Riverbank Formation occur within the Project area. Online museum and database records indicate numerous fossil specimens representing plants, mammals, reptiles, and birds from within the Modesto and Riverbank Formations throughout the San Joaquin Valley. These include at least 14 vertebrate fossil specimens from 12 localities within unnamed Pleistocene deposits in Tulare County. Records search results indicate three vertebrate fossil localities yielding *Mammuthus* (mammoth) and *Equus* (horse) within sediments consistent with the Modesto and Riverbank Formations. However, no previously recorded paleontological localities are directly within Project boundaries.

Æ Paleontology Field Monitor Michael George completed a pedestrian field survey of the Project area on January 12, 2021, to confirm the presence/absence of exposed fossils on the ground surface and to evaluate geologic exposures for their potential to yield subsurface fossil material. He did not record any new fossil localities during the survey.

As a result of this study, Æ assigned high paleontological resource potential (i.e., sensitivity) to the Project area because the fossiliferous Modesto and Riverbank Formations mapped near the Project area likely also occur within the Project area at depths as shallow as 7 feet below ground surface (bgs). Significant and intact fossils have been recorded in these geologic units in the vicinity of the Project area and elsewhere in the San Joaquin Valley. Recent fluvial sediments overlying these geologic formations and visible at the present ground surface have low paleontological sensitivity. Therefore, Æ suggests paleontological sensitivity increases with depth within the Project area.

Undisturbed geologic units with a proven potential to yield significant paleontological resources occur at 7 feet bgs in the Project area. Therefore, the potential for impacting significant fossils during ground-disturbing construction activities is high and Æ recommends paleontological

resource mitigation monitoring during Project construction. Æ additionally suggests a Paleontological Resource Mitigation and Monitoring Program for the Project, including, but not limited to, a preconstruction Worker's Environmental Awareness Training module. By implementing these mitigation measures during Project development, adverse impacts to paleontological resources can be reduced to a less than significant level pursuant to the requirements of the CEQA.

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1
INTRODUCTION

At the request of Sespe Consulting, Inc., Applied EarthWorks, Inc. (Æ) completed an updated paleontological resource assessment (PRA) for the Tulare Irrigation District's McKay Point Reservoir Project (Project) located approximately 20 miles northeast of the city of Visalia in Tulare County, California (Figure 1-1). This PRA is written in partial satisfaction of requirements of the California Environmental Quality Act (CEQA), and Tulare Irrigation District (TID) is the Lead Agency for CEQA compliance. This report serves as an addendum to the previous PRA for the Project, written by Æ staff in 2014 (Clifford and DeBusk, 2014).

1.1 PROJECT DESCRIPTION

The Project area is in the San Joaquin Valley, on the north side of the divergence of the Kaweah and St. Johns Rivers at McKay Point in Tulare County. The Project area is mapped in Sections 3 and 4 of Township 18 South, Range 27 East, as shown on the Woodlake, California, 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle map (Figure 1-2).

The Project would require discretionary approvals and is therefore subject to the CEQA. The TID is the Project applicant and the CEQA Lead Agency. The TID proposes the excavation, construction, and maintenance and operation of the McKay Point Reservoir (Project) on behalf of the Visalia and Kaweah Water Company and the Consolidated Peoples Ditch Company (Owners). The reservoir would provide surface water storage and reregulation to optimize groundwater recharge within the Owners' service areas.

The Project area consists of 194 acres within the McKay Point property, including excavation of a 110-acre pit extending 60 feet below the ground surface. West Coast Sand and Gravel would be contracted to complete excavation of overburden and transform the aggregate into saleable material offsite. Other construction elements include inflow and outflow channels with reinforced concrete base and riprap, a flow/level control gate, an infiltration gallery made up of on-site ditches, a peripheral fence with access road, an entrance gate, and a generator building. The Project also includes a habitat area adjacent to the reservoir. This area will be preserved and not subjected to any ground-disturbing activity.

1.2 PURPOSE OF INVESTIGATION

This PRA is designed to accomplish several goals: (1) identify the geologic units within the Project area and assess their paleontological resource potential; (2) determine whether the Project has the potential to adversely impact scientifically significant paleontological resources; (3) provide Project-specific management recommendations for paleontological resources, as necessary; and (4) demonstrate compliance with state laws and regulations. The following section describes the ways in which this PRA meets the stated goals.

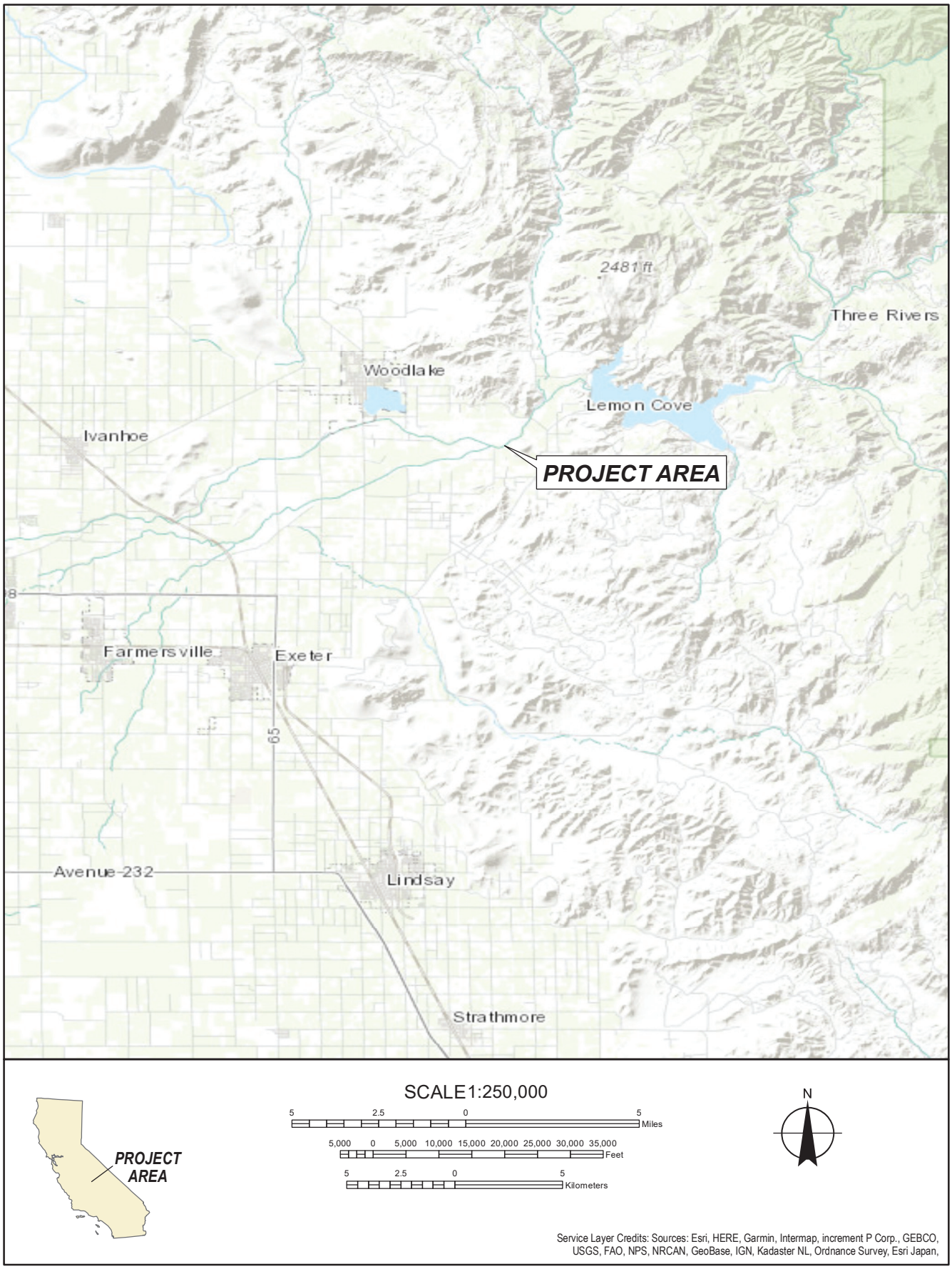


Figure 1-1 Project vicinity in Tulare County, California.

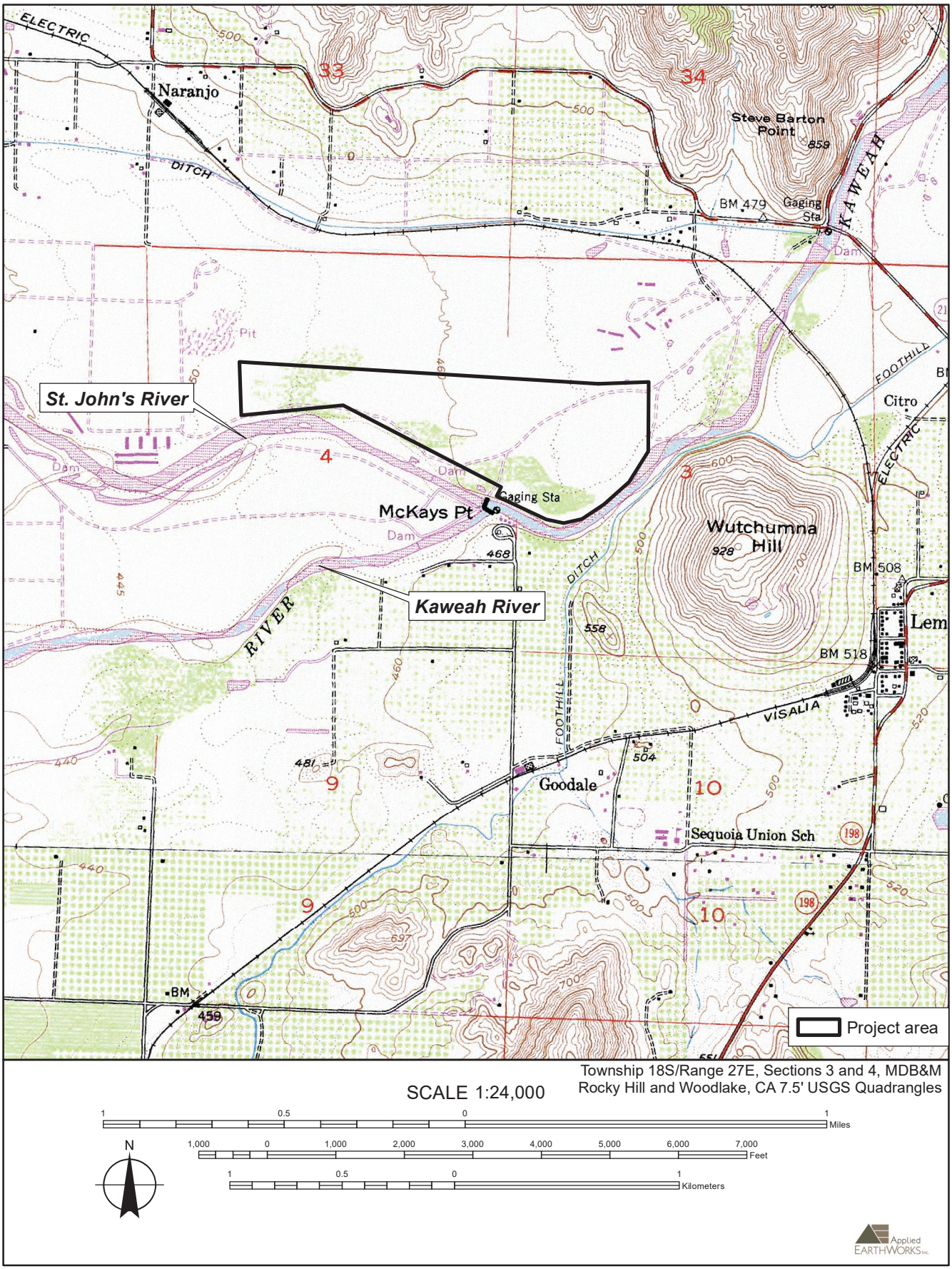


Figure 1-2 Project location map.

1.3 KEY PERSONNEL

The original 2014 study was prepared by Æ's former Paleontology Program Manager Jessica DeBusk and former Staff Paleontologist Heather Clifford. Their credentials were provided in that report and are not repeated herein. For the present study, Æ Paleontology Program Manager Dr. Amy Ollendorf served as the principal investigator for the Project. She oversaw each task required for this PRA, including quality control. Ollendorf qualifies as a principal investigator for paleontology per industry standards (Murphey et al., 2019), although she does not meet Society of Vertebrate Paleontology (SVP) standards. Æ Senior Paleontologist Melissa Macias completed the desktop research, wrote the updated PRA, and created the figures. Paleontological Field Monitor Michael George completed the field survey, with assistance from Macias. Macias meets SVP (2010) and industry standards for qualified professional paleontologist (principal investigator, project paleontologist), and George is a qualified paleontological monitor.

Macias has master's and undergraduate degrees in geology; her master's degree research focused on mammalian paleontology and biogeography. She has over 10 years of experience in geology and paleontology, including the past 5 years in paleontological monitoring, recovery and preparation of fossil remains, laboratory analysis, and report preparation. George has a bachelor's degree in geology and field experience in the San Joaquin Valley. His 6 years of experience in geology and paleontology includes paleontological monitoring and recovery, preparation, and laboratory analysis of fossil remains. Ollendorf has interdisciplinary doctoral and master's degrees involving geology and micropaleontology and an undergraduate degree in geology and anthropology (double major), both of which also focused on paleontological subject matter. Ollendorf has extensive field and laboratory experience in invertebrate and botanical paleontology. Ollendorf also is the principal investigator for paleontology on Æ's 2018–2021 California Statewide Paleontological Resource Use Permit (CA-18-05P). She also is a Registered Professional Archaeologist (RPA 12588) with over 37 years of experience. Qualifications for Æ's key paleontology personnel can be found in Appendix A.

1.4 REPORT ORGANIZATION

Chapter 1 has described the Project, defined the purpose of the investigation, and provided a description of Æ's key personnel for this PRA. Chapter 2 discusses the regulatory framework governing the Project. Chapter 3 presents the paleontological sensitivity criteria and resource guidelines used for this assessment. Chapter 4 provides the methods employed, and Chapter 5 describes the geology and paleontology of the Project area. The results of the desktop studies, field survey, and paleontological sensitivity assessment are presented in Chapter 6. Management recommendations can be found in Chapter 7, and references cited are listed in Chapter 8. Appendix A includes qualifications of key personnel.

2
REGULATORY ENVIRONMENT

Paleontological resources (i.e., fossils) are considered nonrenewable because when they are destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under various federal, state, and local laws. This Project is not subject to federal laws. Consequently, all resources are protected under only state and local laws.

2.1 STATE

California is among the states that protect paleontological resources. CEQA is the legal framework through which this protection is accomplished. Enacted in 1970, CEQA does not directly regulate land uses but instead requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts.

2.1.1 California Environmental Quality Act

This Project is subject to Section 15002(a)(3) of the Guidelines for Implementation of CEQA (California Code of Regulations [CCR], Title 14, Chapter 3), which states one of the basic purposes of CEQA is the intention to "prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible." Therefore, CEQA requires detailed studies that analyze the environmental effects of a proposed project.

If a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. Specifically, in Section VII(f) of Appendix G of the CEQA Guidelines, the Environmental Checklist Form poses the question: "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" If paleontological resources are identified as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

Guidelines for implementation of CEQA are codified in 14 CCR 15000 et seq., which requires state and local public agencies to identify the environmental impacts of proposed discretionary activities or projects, determine if the impacts will be significant, and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. The various agencies within state government all have their own guidance documents to assist with CEQA compliance. The TID is the government agency responsible for compliance with the CEQA for the Project. The TID relies on Tulare County (County) guidance for the treatment of paleontological resources under the CEQA.

2.2 LOCAL

The County provides guidance for the identification, protection, and preservation of significant paleontological resources. The following section describes all relevant policies, goals, and objectives.

2.2.1 Tulare County

The County specifically addresses paleontological resources under the following policies in Chapter 3: Environmental Analysis of the *Tulare County General Plan* (Tulare County, 2012).

> **ERM Implementation Measure 55B:** In the event that archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the project site be suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. The County will require that a qualified archaeologist/paleontologist make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recovery, excavation, analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of project design as previously approved by the County.

Although not required prior to construction, the TID opted to proactively contract for the preconstruction PRA in an effort to prepare for the Project's ground-disturbing activities.

3
PALEONTOLOGICAL RESOURCE ASSESSMENT GUIDELINES

Protection of paleontological resources requires assessment of the potential for geologic units to yield significant paleontological resources that could be directly or indirectly impacted or destroyed during Project development. Successful protection also involves the formulation and implementation of appropriate management measures to mitigate impacts.

3.1 DEFINITION OF PALEONTOLOGICAL RESOURCES AND SIGNIFICANCE CRITERIA

Paleontological resources are defined by the Society of Vertebrate Paleontology (SVP, 2010) as fossils and fossiliferous deposits. Fossils are the evidence of once-living organisms as preserved in the rock record. They include both the lithified remains of ancient plants and animals and the traces thereof (trackways, imprints, burrows, etc.). In general, the SVP (2010) considers fossils to be greater than 5,000 years old (older than middle Holocene[1]) and to typically be preserved in sedimentary rocks, although certain volcanic rocks and low-grade metamorphic rocks may be fossiliferous if formed under certain conditions.

Well-preserved and identifiable individual fossils are considered significant paleontological resources if they are a type specimen, rare, a complete specimen, or part of an important diverse fossil assemblage. Of particular importance are fossils found in situ, or undisturbed from their primary geologic context. These fossils are important because they are used to examine evolutionary relationships, provide insight on the development of and interaction between biological communities, establish time scales for geologic studies, and for many other scientific purposes, including investigation into paleoenvironments and paleoclimates (Scott and Springer, 2003; SVP, 2010). Intact and in situ vertebrate fossils are usually assigned a greater significance than other types of fossils as they are comparatively rare. Consequently, more attention tends to be placed on the recovery of vertebrate fossils than other types.

3.2 PROFESSIONAL STANDARDS AND CLASSIFICATION OF PALEONTOLOGICAL RESOURCE SENSITIVITY

Most professional paleontologists in California adhere to the SVP (2010) guidelines, unless others are available. The SVP's guidelines establish detailed protocols for the assessment of the paleontological sensitivity of a project area and outline measures to follow in order to mitigate adverse impacts to known or unknown fossil resources during project development (SVP, 2010).

[1] middle Holocene: extends from 8,200 to 4,200 years ago in the Holocene Epoch of the Quaternary Period, covering approximately the past 11,700 years (Cohen et al., 2021); the Quaternary Period also includes the older Pleistocene Epoch, which lasted from approximately 2.6 million years ago to approximately 11,700 years ago (Cohen et al., 2021).

Baseline information gathered during a paleontological resource assessment is used to assign the paleontological sensitivity of the geologic unit(s) (or members thereof) exposed at or distributed across the ground surface of a project area, in addition to those thought to be beneath a project area at depth. It should be noted that surface geology is not always indicative of subsurface geology or the potential for paleontological resources. For instance, an area whose surface geology is mapped as non-fossiliferous sediments may cover fossil-rich Pleistocene sediments at depth. Also, an area mapped as granite, devoid of fossils, may be covered by fossil-rich Pleistocene sediments. Thus, actual paleontological sensitivity across a project area ultimately can be determined only through a combination of desktop and field efforts.

The SVP provides a classification system to rank a geologic unit's sensitivity or potential for significant paleontological resources. The SVP scale includes High, Undetermined, Low, and No Potential. Geologic units are considered to have a high potential if vertebrates or significant specimens of other fossil types have been recovered anywhere in their extent; or if the units are sedimentary rocks that are temporally or lithologically suitable for the preservation of significant fossils. The criteria for the categories are shown in Table 3-1.

Table 3-1
Paleontological Sensitivity Classifications

SVP Sensitivity/ Potential	Criteria[1]	Mitigation Recommendations[2]
High	Rock units from which vertebrate or significant specimens of other fossil types have been recovered are considered to have a high potential. Rock units with high potential also may include rock units that are temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, argillaceous and carbonate-rich paleosols, fine-grained marine sandstones, etc.).	Typically, a field survey, mitigation program, and on-site construction monitoring will be required. Any significant specimens discovered during monitoring will need to be prepared, identified, and curated into a museum. A final report documenting the significance of the finds will also be required.
Undetermined	In some cases, available literature on a particular rock unit will be scarce and a determination of whether or not it is fossiliferous or potentially fossiliferous will be difficult to make. Under these circumstances, further study is needed to determine the unit's paleontological resource potential.	A field survey is required to further assess the unit's paleontological potential. The survey may provide data for development of a Paleontological Resource Impact Mitigation Program (PRIMP) prior to construction.
Low	Rocks units from which few fossils have been recovered or are generally unsuitable for preservation of fossils are considered to have a low potential. These units typically yield fossils only on rare occasions and under unusual circumstances (e.g., basalt flows, recent colluvium, etc.).	Mitigation is not typically required; however, if an unanticipated paleontological resource is encountered, a qualified professional paleontologist (Principal Investigator, Project Paleontologist) may need to evaluate the resource to consider mitigation.
No Potential	Rock units that have no potential for paleontological resources are those that are formed under or exposed to immense heat and pressure, such as high-grade metamorphic rocks and plutonic igneous rocks.	No mitigation required.

4
METHODS

This PRA was completed through desktop studies and a field survey. The twofold purpose of the off- and on-site research was: (1) to identify the geologic units in the Project area and immediate vicinity to determine whether previously recorded paleontological localities occur either within the Project area or within the same geologic units elsewhere nearby and (2) to determine the sensitivity of the geologic units in the Project area for their potential to yield paleontological resources.

4.1 LITERATURE REVIEW AND MUSEUM RECORDS SEARCHES

In many areas, the near-surface layers of sediments and sedimentary rocks are broken down and converted to soil (pedogenesis) through chemical and physical weathering processes (Boggs, 2012). During pedogenesis, any fossils preserved within the near-surface layers often are destroyed or rendered unrecognizable. Therefore, intact and identifiable fossils are unlikely to be found in soil. Reviews of relevant geologic maps, regional geological publications, and unpublished reports are necessary to ascertain the geology and stratigraphy of a project area to determine the potential for significant subsurface paleontological resources. The geotechnical report for the Project provided additional information on subsurface geology and sediment types (Lau and Schwartz, 2011).

To supplement the map and literature reviews, Æ requested a search of museum collection records maintained by the Natural History Museum of Los Angeles County (NHMLAC). Æ also completed online searches of two databases readily available to the public—the Paleobiology Database (PBDB) and the database maintained by the University of California Museum of Paleontology (UCMP). In addition, Æ utilized information presented in the previous PRA for the Project (Clifford and DeBusk, 2014).

4.2 FIELD SURVEY

Prior to the field survey, Æ also examined recent aerial photographs of the entire Project area in Google Earth to determine likely locations of geologic outcrops and potential survey routes. Michael George, Æ's paleontological field technician, conducted the field reconnaissance survey for the Project on January 12, 2021. The purpose of the survey was to confirm the presence/absence of exposed fossils on the ground surface and to evaluate geologic exposures for their potential to yield subsurface fossil material. The survey consisted of a combination of close visual inspection and spot-checking to inspect the ground surface for evidence of paleontological resources while using the Arrow 100 Global Positioning System (GPS) antenna and the ArcGIS Collector application to navigate throughout the Project area and collect field data, if needed.

George conducted close visual inspection in portions of the Project area where the ground surface was visible and unobscured by vegetation, excluding the dense trees and bushes in the southeast. He conducted spot-checking for the remainder of the Project area where the ground surface was obscured by vegetation. George kept notes on the geology and sedimentology

encountered and took photographs to document the survey. If he observed any fossils, he field-documented but did not collect them.

5
GEOLOGY AND PALEONTOLOGY

The following sections provide the geological context of the Project area as well as descriptions of the geologic units mapped as surface exposures within the boundaries of the Project area in addition to units exposed nearby and thought to be present in the subsurface. The section also includes any paleontological information reported from the units.

5.1 REGIONAL GEOLOGY

The Project area is on the eastern margin of the San Joaquin Valley within the Great Valley geomorphic province of California. A geomorphic province is a region of unique topography and geology that is readily distinguished from other regions based on its landforms and diastrophic history (Norris and Webb, 1976). The Great Valley is a north-northwest–trending asymmetric structural trough bisected by the Stockton Arch, a structural feature that subdivides the region into the Sacramento Valley in the north and the San Joaquin Valley to the south. The Great Valley is roughly 400 miles long and 50 miles wide and water from the Pacific Ocean covered the trough as far back as the Jurassic (201–145 million years ago [Ma]) and into the Paleogene (66–23 Ma).

Deposition into the Great Valley began during the Late Jurassic (164 Ma) as the paleo-Sierra Nevada began to rise and deliver eroded sediments to the lowlands. Forearc (i.e., the deep marine region between a volcanic arc and the associated subduction zone) marine and nonmarine shale, sandstone, and conglomerate of the Cretaceous Great Valley Sequence were deposited during this time unconformably on top of the Franciscan Complex of the Coast Range and the Sierran Batholith (Bartow and Nilsen, 1990). During the late Mesozoic and much of the Cenozoic (66 Ma to the present), the actively subsiding region persisted as a submerged lowland basin, known as the Great Valley Sea (Bartow, 1991).

By the Pliocene (5.3–2.6 Ma), most of the marine waters in the Great Valley retreated and brackish and freshwater lakes remained (Weissmann et al., 2005). The present surface of the valley floor is composed of mostly unconsolidated Pleistocene age (2.6 Ma to 11,700 years before present [B.P.]), alluvial sediments associated with the drainage of the glaciated Sierra Nevada, alluvial deposits originating from the Coast Ranges, and recent sediments largely representing the alluvial, flood, and delta plains of the Sacramento and San Joaquin Rivers (Matthews and Burnett, 1965; Norris and Webb, 1976; Bartow, 1991; Weissmann et al., 2005). The east side of the valley in the vicinity of the Project is characterized by a broad plain of low relief consisting of large coalescing alluvial fans (e.g., the Kaweah River Fan) derived from streams flowing from the Sierra Nevada (Weissmann et al., 2005).

5.2 GEOLOGY AND PALEONTOLOGY OF THE PROJECT AREA

The Project area has been mapped at various scales:

- **1:500,000:** Generalized Geologic Map and Cross Sections of the San Joaquin Valley, California (Bartow, 1991; and references therein)

- **1:250,000:** Geologic Map of the Hanford-Visalia Area, San Joaquin Valley, California (Croft and Gordon, 1968; and references therein); Geologic Map of California—Fresno Sheet (Matthews and Burnett, 1965; and references therein)

Matthews and Burnett (1965) is part of the *Geologic Atlas of California* series published between 1958 and 1969, which provides the first complete, consistent view of the geology of the state (California Department of Conservation, 2019). These compilations adopt a single set of map symbols to correlate potentially equivalent geologic units by defining the units only by geologic time, rather than by both time and lithology. Consequently, this PRA is based largely on the interpretations of Matthews and Burnett (1965) as the most recent published and most comprehensive map.

Published geologic mapping of the region indicates that the ground surface of the Project area consists of Holocene nonmarine (fluvial) terrace deposits and the Modesto Formation (Qf) of late Pleistocene age (Matthews and Burnett, 1965) (Figure 5-1). The Riverbank Formation (Qc) is exposed directly across the Kaweah River from the Project area and likely underlies the Modesto Formation within the Project area (Matthews and Burnett, 1965).. Due to its low-lying position on the floodplains of the Kaweah and St. John's Rivers, the Project area includes recent channel and overbank fluvial deposits, which conformably overlie the Modesto Formation. The thickness of the recent fluvial deposits is estimated to be 2–5 feet due to the degradational nature of the stream and sediment trapping in the upstream Terminus Reservoir Dam (Berryman and Elasser, 1966).

In the vicinity of the Project area, the gently sloping San Joaquin Valley floor rises toward the northeast, reaching an elevation of 600–800 feet above mean sea level (amsl). Wutchumna Hill peaks at over 900 feet amsl southeast of the Project area on the opposite bank of the Kaweah River. In general, the local geomorphology of the San Joaquin Valley is relatively flat with minor topographic relief derived from flooding and fluvial processes, including terraces and sloughs. In general, the soils are sandy, permeable, and fertile but may consist of hardpan in some areas (Croft and Gordon, 1968).

5.2.1 Modesto Formation (Qf)

The Modesto Formation is late Pleistocene in age and consists of poorly indurated fluvial and alluvial deposits and well-developed soils (Davis and Hall, 1959; Marchand and Allwardt, 1981). The sediments consist of andesitic to arkosic granitic sand, silt, and gravel, which drained from the Sierra Nevada during the late Pleistocene Wisconsin glaciations (Weissmann et al., 2002). The Modesto Formation extends from the Sacramento River in the north to the Tule River in the south (Matthews and Burnett, 1965).

Local deposits of Holocene alluvial sediments cover the Modesto Formation. An unconformable contact marks the boundary between the Modesto Formation and the underlying middle Pleistocene Riverbank Formation. The Modesto Formation was first described by Davis and Hall (1959) and later redescribed by Marchand (1977) at its type section located at a road cut near the Mitchell Road Bridge above the Tuolumne River in the town of Ceres, California.

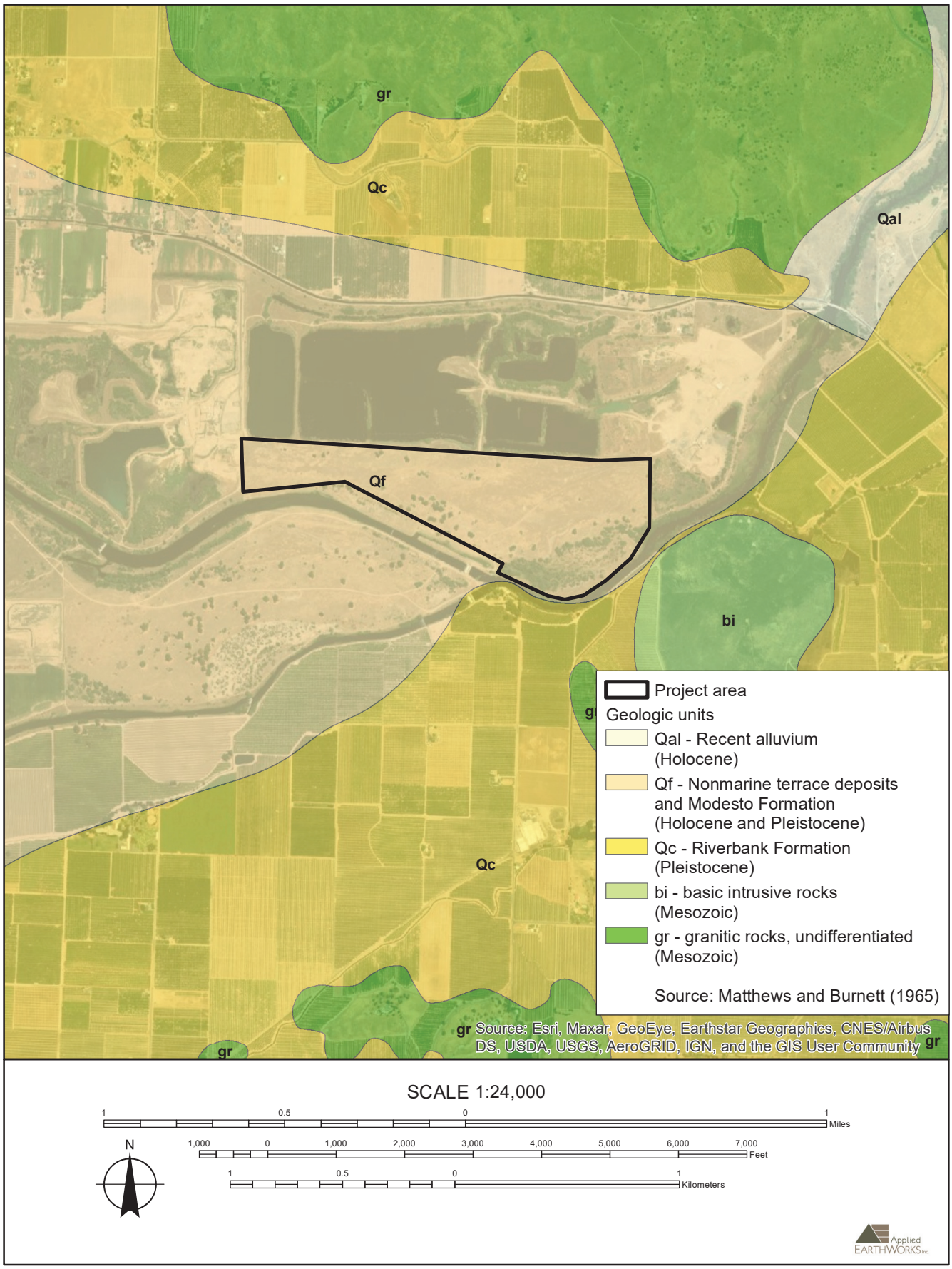


Figure 5-1 Geologic units in the Project area and vicinity.

Marchand (1977) informally divides the Modesto Formation into a lower and upper member based on topographic expression and the presence of paleosols (i.e., buried soil horizons). The upper member has a maximum thickness of 30 feet and the lower member is up to 70 feet thick (Marchand and Allwardt, 1981). The upper member is composed of massive to well-bedded sand, silt, and clay, with subordinate gravel deposits. Where stratification is absent, the sedimentary structures were most likely destroyed by soil development. The lower member is predominately composed of moderately stratified sand and silt deposits, with localized lenticular cross-lamination. Marchand (1977) lists channel deposits, interdistributary and floodplain deposits, colluvium, and eolian sand as facies recognizable within the Modesto Formation. Where exposed, the base of lower member of the Modesto Formation is marked by a distinct layer of red clay (Hudson, 1960).

The total thickness of the Modesto Formation ranges from 50 to 100 feet and its age is estimated to range from 9,000 to 42,000 B.P. (Marchand, 1977). These depths are characteristic of the Modesto Formation near its type section in center of the San Joaquin Valley where sediment accumulation has been significant. Adjacent to the Sierran foothills in the vicinity of the Project area, basement rock is closer to the ground surface and sediment accumulation is thinner than in the center of the valley. Therefore, the underlying fossiliferous Riverbank Formation may be closer to the ground surface (see below).

The Modesto Formation is generally categorized as having high paleontological sensitivity Paleontological details supporting this ranking are provided in the next chapter.

5.2.2 Riverbank Formation (Qc)

The middle Pleistocene Riverbank Formation consists of granitic sand, silt, and clay primarily derived from the Sierra Nevada (Davis and Hall, 1959). In the vicinity of the Project area elsewhere in Tulare County, the Riverbank Formation is unconformably underlain by Mesozoic granitic rocks (mapped as gr by Matthews and Burnett [1965]). Davis and Hall (1959) first described the Riverbank Formation, which was later redescribed by Marchand and Allwardt (1981) at its type section located on the banks of the Stanislaus River in the town of Riverbank.

The Riverbank Formation consists of moderately consolidated deposits of massive to well-bedded silty sand, arkosic sand, pebbly sand, and gravel lenses. Locally, fine sand may exhibit eolian sorting and coarse sand and gravel may be interbedded with silt and clay deposits (Marchand, 1977). These sediments comprise older alluvium, dissected fan, and nonmarine sedimentary deposits in the San Joaquin Valley (Smith, 1964; Matthews and Burnett, 1965). The thickness of the Riverbank Formation ranges from approximately 50 to 250 feet in the San Joaquin Valley and it is estimated to range in age from 130,000–450,000 thousand years (Marchand and Allwardt, 1981).

The Riverbank Formation is generally categorized as having high paleontological sensitivity. The next chapter provides paleontological details supporting this ranking.

5.2.3 Mesozoic Granitic and Basic Intrusive Rocks (gr, bi)

Outcrops of undifferentiated Mesozoic granitic rocks (gr) are present at the surface to the north and east in the Sierran foothills. These include felsic, intermediate, and mafic intrusive rocks

associated with the Sierra Nevada batholith. Wutchumna Hill is composed of mafic (basic) intrusive rocks (bi), specifically hornblende gabbro. These and other associated igneous rocks in the Sierra Nevada batholith have eroded and have been deposited in the surrounding valley floor as the Modesto and Riverbank Formations and associated colluvium adjacent to the Sierran foothills (Matthews and Burnett, 1965).

Per the SVP classification system, intrusive rocks are generally categorized as having no paleontological sensitivity.

6
RESULTS AND ANALYSIS

This chapter reports on the results of the desktop studies and field survey completed for this Project. Paleontological sensitivity rankings also are assigned to the geologic units mapped at the ground surface and likely present at shallow depths within the Project area.

6.1 LITERATURE REVIEW

In the absence of extensive subsurface testing and observation data from a qualified paleontologist, Æ analyzed the results of nonpaleontological investigative drilling of the Project area (Lau and Schwartz, 2011). Findings in the geotechnical report are consistent with the surficial geology as mapped by Matthews and Burnett (1965). Specifically, the ground surface of the Project area is mapped as Modesto Formation by Matthews and Burnett (1965). Additionally, the Mathews and Burnett (1965) map shows ground surface exposures of the Riverbank Formation immediately adjacent to the Project area. This close proximity implies a strong likelihood for the Riverbank Formation at unknown depths within the Project area. The geotechnical data do not specifically name any of the mapped geologic units discussed above; however, the report identifies olive-gray sand and cobbles beginning at 7 feet bgs and yellowish-brown clayey sand beginning at 25 feet bgs in the borings nearest the Kaweah River and 30–35 feet bgs in the borings farther north. The borings indicate granitic bedrock beginning at 70 feet bgs in the eastern half of the Project area. The borings to the west terminated at 90 feet bgs without encountering bedrock (Lau and Schwartz, 2011). The shallower sediments are consistent with the upper member of the Modesto Formation; the deeper sediments may represent the Riverbank Formation.

The UCMP and PBDB online databases list numerous fossil localities from Tulare County. However, these databases specify no localities from the Pleistocene deposits within a 10-mile radius of the Project area.

The UCMP online database lists at least 28 fossil specimens representing plants, mammals, and reptiles from the Modesto Formation from 13 localities throughout the San Joaquin Valley. In 2006, along the San Joaquin River Parkway trail near Friant and Rice Roads in Fresno, Dundas et al. (2009) discovered a large radius of *Bison* cf. *B. latifrons* eroding from an outcrop in the upper member of the Modesto Formation on the San Joaquin River alluvial fan. The bison radius was preserved in a fine-grained clay- and charcoal-rich floodplain deposit approximately 15–30 inches thick. Other terrestrial vertebrate fossils from within the Modesto Formation include *Megalonyx jeffersonii* (Jefferson's ground sloth), *Bison antiquus* (bison), *Mammuthus columbi* (mammoth), *Camelops* (camel), Serpentes (snakes), and Rodentia (rodents) (UCMP online database). The PBDB online database does not list any fossil specimens from the Modesto Formation.

The UCMP and PBDB online databases list hundreds of fossil specimens representing plants, mammals, reptiles, and birds from the Riverbank Formation from various localities throughout the San Joaquin Valley. During excavations associated with the construction of the Arco Arena in

Sacramento, Hilton et al. (2000) discovered numerous terrestrial vertebrate fossils from within the Riverbank Formation, including Antilocapridae (antelope), *Bison antiquus* (bison), *Camelops hesternus* (camel), *Canis* cf. *latrans* (coyote), Cervidae (deer), *Mammuthus* (mammoth), *Paramylodon harlani* (Harlan's ground sloth), and *Sciurus* (squirrel). In addition, they documented plant fossils at the same locality, including the seed of a *Prunus* cf. *ilicifolia* (holly leaf cherry). All fossil specimens were encountered between 13 and 30 feet below the valley surface and represent taxa that are typical of the Late Pleistocene (Hilton et al., 2000).

Other paleontological localities within the Riverbank Formation yielded *Equus* (horse) as well as Aves (birds), *Canis dirus* (dire wolf), *Equus* (horse), *Mammuthus columbi* (mammoth), *Neotoma* (packrat), *Orthodon* (blackfish), Proboscidea (elephantoid), *Scapanus latimanus* (broad-footed mole), *Thamnophis* (garter snake), and *Thomomys* (pocket gopher) from throughout the northern and central Great Valley. The depths below ground surface at which these discoveries were made are largely unreported (Bell, 2020; UCMP online database).

Previous recent paleontological reports were also reviewed for this PRA (Shi and Ollendorf, 2019; Shi and Ollendorf, 2020). These reports acknowledge the fossil-bearing layers within the Modesto and Riverbank Formations are localized and laterally discontinuous (Hilton et al., 2000; Shi and Ollendorf, 2020). In the absence of specific local subsurface paleontological investigations, one can only focus on the paleontological sensitivity of geologic units rather than speculating about the presence or absence of significant paleontological resources within a given Project area.

6.2 MUSEUM RECORDS SEARCHES

The NHMLAC records search listed no fossil localities within the Project area, although they reported several from sedimentary units equivalent to those mapped in and close to the Project area. Table 6-1 summarizes the records search results from the NHMLAC (LACM and CIT collection acronyms).

Table 6-1
Fossil Localities Reported near the Project Area

Locality No.	Geologic Unit	Taxon	Depth	Approximate Distance from Project Area
LACM VP 1156	Unknown Formation (Pleistocene)	*Plessipus* (horse)	45 feet bgs	43 miles
LACM VP 4087	Unknown Formation (Pleistocene)	*Mammuthus* (mammoth)	Unknown	30 miles
LACM 6071	Unknown Formation (Pleistocene)	*Mammuthus* (mammoth)	6 feet bgs	43 miles

Source: Bell (2020).

The NHMLAC search did not yield any fossil localities within the Project area, although several localities are reported from the sedimentary units that occur in or near the Project area, including Quaternary deposits equivalent to the Modesto and Riverbank Formations (Bell, 2020). The nearest of these localities, LACM VP 4087, is approximately 30 miles due south of the Project area. This locality yielded a *Mammuthus* (mammoth) specimen at an unknown depth. Farther to the southeast is LACM VP 6071, approximately 43 miles from the Project area. This locality also

yielded a *Mammuthus* specimen at approximately 6 feet bgs. A third locality to the south-southwest, LACM VP 1156, yielded a specimen of *Plessipus* (horse) at 45 feet bgs. Because of these results, Bell (2020) suggests shallow excavations into Quaternary deposits exposed throughout most of the Project area may well encounter significant fossil remains.

6.3 FIELD RESULTS

Undisturbed sediments were visible throughout the Project area at the time of Æ's field survey (Figure 6-1), with approximately 80 percent ground visibility. Fine- to medium-grained sands with abundant silt are present in much of the Project area. The point bar of the Kaweah River along the southeastern edge of the Project area has abundant river-rounded cobbles present at the surface (Figure 6-2).



Figure 6-1 Project area overview from the northeast corner of the Project area; facing west.

During the survey, George noted small freshwater bivalves along the riverbank on the southwest edge of the Project area. As these were unfossilized, George determined them to be modern and not a paleontological resource. South of the Project area, George documented a stratigraphic profile along the cut bank of the Kaweah River with interbedded gray sand consistent with the upper member of the Modesto Formation (Figure 6-3). These beds were encountered at 2 feet above the modern riverbed and approximately 8 feet below the mean ground surface of the Project area. George did not encounter any paleontological resources during the survey.



Figure 6-2 **Cobbles in point bar of Kaweah River in southeastern portion of Project area; facing east.**



Figure 6-3 **Overview and stratigraphic profile along the Kaweah River channel; facing southeast.**

6.4 DETERMINATION OF PALEONTOLOGICAL RESOURCE POTENTIAL WITHIN THE PROJECT AREA

Using information obtained from the desktop studies and field survey, Æ determined the paleontological resource potential of the geologic units exposed at the ground surface in the Project area. Æ's paleontological sensitivity rankings follow the SVP's (2010) classification system (Table 3-1, Figure 6-4).

Æ notes the Holocene surficial sediments present within the Project area are likely too young to preserve significant fossils and, therefore, are categorized as having low paleontological sensitivity, although sensitivity increases with depth. The underlying late Pleistocene Modesto and Riverbank Formations have a high likelihood of preserving significant paleontological resources. The nearby Mesozoic basic intrusive and granitic bedrock documented at 68 feet bgs in the geotechnical borings has no potential to preserve significant paleontological resources.

TID anticipates that excavation of the reservoir will not exceed 60 feet bgs. Therefore, Æ suggests that the entire Project area has high potential for significant paleontological resources at depths greater than 5 feet bgs.

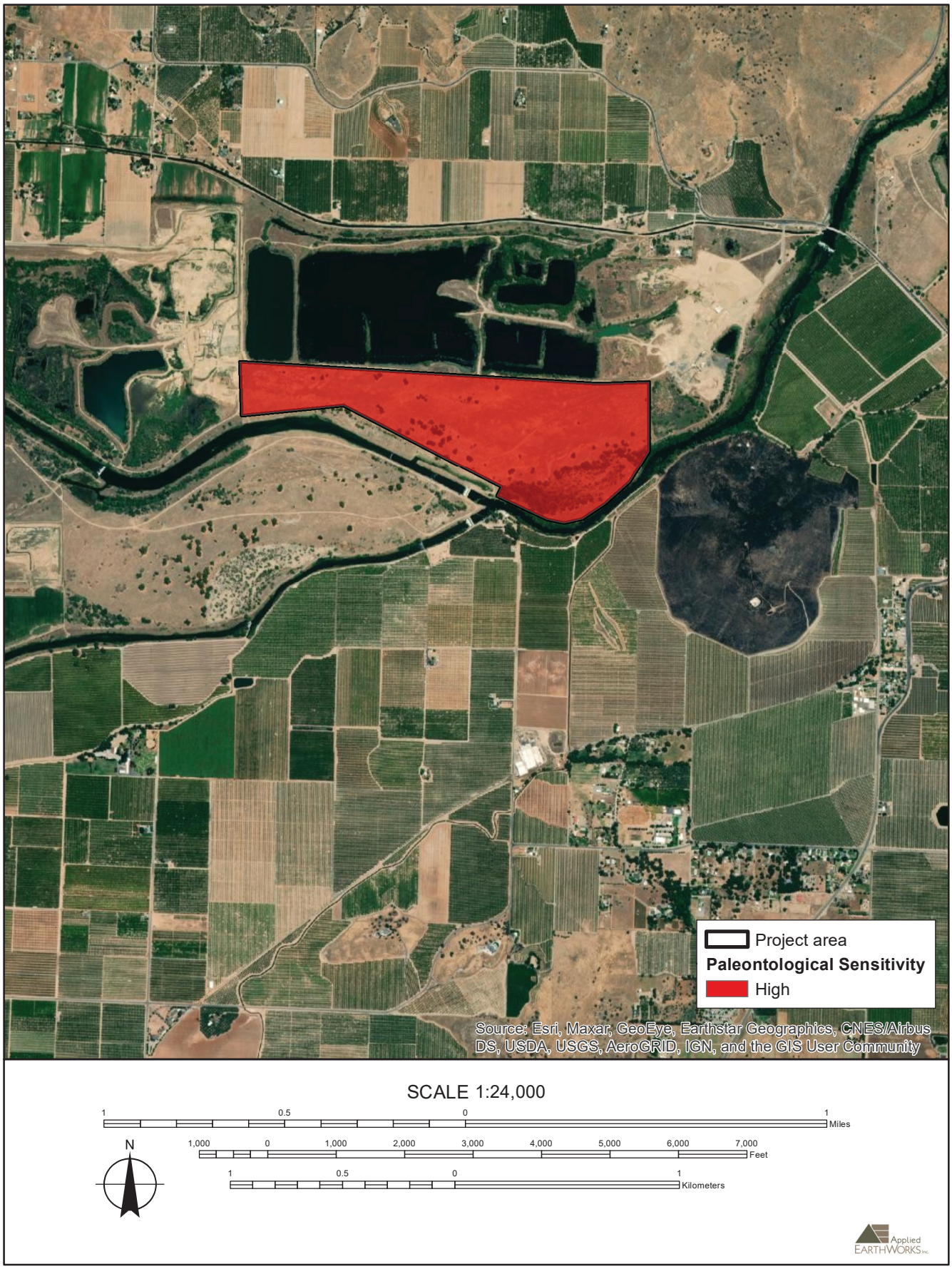


Figure 6-4 Paleontological sensitivity of the Project area.

7
RECOMMENDATIONS

This assessment is based on the results of a museum records search and review of available geologic and paleontological literature. Therefore, only fossils that have already been inventoried or collected are available for this analysis. In general, the potential for a given project to result in adverse impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project. Due to the substantial excavations planned for the construction of the project, there is a relatively high potential for an unknown number of paleontological resources to be adversely impacted. However, by implementing management recommendations outlined in this chapter, including worker's environmental awareness training and on-site construction monitoring, adverse impacts to paleontological resources can be reduced to a less than significant level pursuant to the requirements of CEQA.

Æ concludes that Project-related construction activities may impact significant paleontological resources across the entire Project area, especially at depth. Æ's desktop studies and field survey together indicate the paleontological resource potential near the ground surface and to the anticipated maximum depth of excavation is high throughout the Project area (see Table 3-1 for sensitivity classifications). Sources of potentially significant paleontological resources are the Modesto and Riverbank Formations, likely present at depth within the Project area. Therefore, Æ suggests the entire Project area to have high potential for significant paleontological resources at depths greater than 5 feet bgs.

Because of the high paleontological sensitivity of the Project area, Æ recommends a Paleontological Resource Mitigation and Monitoring Program (PRMMP) be prepared by a qualified professional paleontologist as defined by the SVP (2010) and industry standards (Murphey et al., 2019). The PRMMP will assist with compliance with ERM Implementation Measure 55B (Tulare County, 2012) by specifying the steps to be taken to mitigate impacts to paleontological resources, if any are encountered during Project-related ground disturbance. For instance, Worker's Environmental Awareness Program training should be presented to construction personnel prior to the start of any ground disturbance.

A PRMMP also will indicate where construction monitoring will be required for the Project and the frequency of required monitoring (i.e., full-time, spot-checks, etc.). In addition to construction monitoring procedures, a PRMMP also will provide details about fossil collection, analysis, and preparation for permanent curation at an approved repository, such as the NHMLAC or UCMP. Lastly, the PRMMP describes the different reporting standards to be used—monitoring with negative findings versus monitoring resulting in fossil discoveries.

8
REFERENCES CITED

Bartow, J. A. 1991. The Cenozoic Evolution of the San Joaquin Valley, California. U.S. Geological Survey Professional Paper 1501. U.S. Department of the Interior, Washington, D.C., 47 pp.

Bartow, J. A., and T. H. Nilsen. 1990. Review of the Great Valley Sequence, Eastern Diablo Range and Northern San Joaquin Valley, Central California. U.S. Geological Survey Open-File Report 90-226. U.S. Department of the Interior, 25 pp.

Bell, A. 2020. Paleontological Resources for the McKay Point Reservoir Project. Research and Collections, Natural History Museum of Los Angeles County, Los Angeles, California.

Berryman, L. E., and A. E. Elasser. 1966. Terminus Reservoir: Geology, Paleontology, Flora and Fauna, Archaeology, History. U.S. Army Corps of Engineers, Sacramento District.

Boggs, S., Jr. 2012. Principles of Sedimentology and Stratigraphy. 5th Edition. Prentice Hall, Upper Saddle River, New Jersey, 585 pp.

California Department of Conservation. 2019. CGS Regional Geologic Maps. Available at https://www.conservation.ca.gov/cgs/maps-data/rgm. Accessed June 15, 2020.

Clifford, H. L., and J. L. DeBusk. 2014. Paleontological Resource Assessment for the McKay Point Reservoir Project, Tulare County, California. Applied EarthWorks, Inc., Fresno, California. Submitted to Sespe Consulting, Inc., Ventura, California.

Cohen, K. M., S. C. Finney, P. L. Gibbard, and J.-X. Fan. 2021. The ICS international chronostratigraphic chart 2021/01 (2013; updated). Episodes 36:199–204. Available at https://stratigraphy.org/icschart/ChronostratChart2020-01.pdf.

Croft, M. G., and G. V. Gordon. 1968. Geology, Hydrology, and Quality of Water in the Hanford-Visalia Area, San Joaquin Valley, California. U.S. Geological Survey Open-File Report 68-67. U.S. Department of the Interior, Geological Survey, Water Resources Division, Menlo Park, California, 68 pp.

Davis, S. N., and F. R. Hall. 1959. Water Quality of Eastern Stanislaus and Northern Merced Counties, California. Stanford University Publications in Geological Science 6. School of Mineral Sciences, Stanford University.

Dundas, R. G., Y. Ibarra, F. J. M. Harmsen, and P. K. Van De Water. 2009. Bison cf. B. latifrons from the late Pleistocene Broach Locality, Fresno, California. Current Research in the Pleistocene 26:149–151.

Hilton, R. P., D. C. Dailey, and H. G. McDonald. 2000. A Late Pleistocene Biota from the Arco Arena Site, Sacramento, California. PaleoBios 20(1):7–12.

Hudson, F. S. 1960. Post-Pliocene Uplift of the Sierra Nevada, California; pp. 1547–1574 in Geological Society of America Bulletin, Vol. 71.

Lau, O. M., and K. Schwartz. 2011. Geotechnical Engineering Investigation Report Proposed McKay Point Reservoir Project Phase 1: Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare County, California. BSK Associates Bakersfield, California.

Marchand, D. E. 1977. Late Cenozoic Stratigraphic Units, The Cenozoic History of the San Joaquin Valley and Adjacent Sierra Nevada as Inferred from the Geology and Soils of the Eastern San Joaquin Valley; pp. 39–50 in M. J. Singer (ed.), American Society of Agronomy, Geological Society of America, Soil Sciences Society of America, Joint Field Section 1977, Guidebook, University of California Press, Davis.

Marchand, D. E., and A. Allwardt. 1981. Late Cenozoic Stratigraphic Units, Northeastern San Joaquin Valley, California. U.S. Geological Survey Bulletin 1470. Government Printing Office, Washington, D.C., 77 pp.

Matthews, R. A., and J. L. Burnett. 1965. Geologic Map of California: Fresno Sheet. 1:250,000 scale. Geologic Atlas of California. Department of Conservation, Division of Mines and Geology, Sacramento, California.

Murphey, P. C., G. E. Knauss, L. H. Fisk, T. A. Deméré, and R. E. Reynolds. 2019. Best practices in mitigation paleontology. Proceedings of the San Diego Society of Natural History No. 47, 43 pp.

Norris, R. M., and R. W. Webb. 1976. Geology of California. Wiley and Sons, Santa Barbara, California.

Scott, E., and K. Springer. 2003. CEQA and Fossil Preservation in California. The Environmental Monitor Fall 2003.

Shi, C., and A. L. Ollendorf. 2019. Paleontological Technical Memorandum: CEMEX Rockfield Modification Project, Fresno County, California. Applied EarthWorks, Inc., Pasadena, California. Prepared for Bauda Associates, Inc.

Shi, C., and A. L. Ollendorf. 2020. Paleontological Field Survey Report for the Bellota-Warnerville 230 kV Reconductoring Project, San Joaquin and Stanislaus Counties, California. Applied EarthWorks, Inc., Pasadena, California. Prepared for Stantec Consulting Services, Inc., San Francisco, California. Submitted to Pacific Gas and Electric Company, Sacramento, California.

Smith, A. R., (compiler). 1964. Bakersfield Sheet. 1:250,000 scale. Geologic Atlas of California, Map No. 2. Division of Mines and Geology, California Department of Conservation.

SVP. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee. Available at https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf. Accessed April 1, 2021. 11 pp.

Tulare County. 2012. Tulare County General Plan, 2030 Update. Available at http://generalplan.co.tulare.ca. Accessed January 31, 2013.

Weissmann, G. S., G. L. Bennett, and A. L. Lansdale (eds.). 2005. Factors Controlling Sequence Development on Quaternary Fluvial Fans, San Joaquin Basin, California, U.S.A. Alluvial Fans: Geomorphology, Sedimentology, Dynamics, Geological Society of London Special Publication 251, 169–186 pp.

Weissmann, G. S., J. F. Mount, and G. E. Fogg. 2002. Glacially Driven Cycles in Accumulation Space and Sequence Stratigraphy of a Stream-dominated Alluvial Fan, San Joaquin Valley, California, U.S.A. Journal of Sedimentary Research 72(2):240–251.

APPENDIX A

Qualifications of Key Personnel

AMY L. OLLENDORF

Managing Principal/Paleontology Program Manager

Education

Postdoctoral Research Associate, 2006–2007, World Heritage Studies, University of Minnesota

Ph.D., Ancient Studies, 1993, University of Minnesota

M.S., Ancient Studies, 1986, University of Minnesota

B.S., Anthropology (with honors) and Geology, 1983, Beloit College

Registrations/Certifications

- Registered Professional Archaeologist 12588
- Licensed Professional Geologist, Minnesota 30084 (6/1998–6/2018, expired)
- Certified Paleontologist and Archaeologist, Orange County (2020–present)
- Paleontology and Cultural Consultant, Riverside County (2018–present)

Professional Experience

- 2018–present, Managing Principal/ Paleontology Program Manager, Applied EarthWorks, Inc.
- 2015–2018 and 2005–2008, President and Senior Project Manager, ALO Environmental Associates LLC
- 2006–2015, Program Manager, Cultural Heritage Planning and Management, AECOM
- 2003–2005, Director, Cultural Resources Management, Peterson Environmental Consulting, Inc.

Summary of Qualifications

Dr. Ollendorf has more than 37 years of experience in cultural heritage, geoarchaeology, paleoecology, paleontology, and environmental compliance at the global, national, tribal, state, and local levels. She meets industry standards for principal investigator in paleontology and she is also Æ's principal investigator on Æ's California statewide Paleontological Resource Use Permit for paleontology from the US Bureau of Land Management (BLM) for 2018–2021.

Dr. Ollendorf has supervised and/or participated in archaeological, historical, architectural history, and paleontological services, tribal negotiations, and agency coordination throughout her career. She also has managed EISs and EAs. Her project experience includes work in 35 states, including Southern California, and other western states, and abroad on a wide range of client projects across many different industry sectors.

During her career, Dr. Ollendorf has written or overseen many hundreds of compliance reports in addition to having published multiple articles in peer-reviewed professional journals and presented to a wide variety of audiences, including professional peers.

Selected Project Experience

Port San Luis Harbor Terrace Project, San Luis Obispo County, California. Paleontology Program Manager (2019–present). Oversaw preparation and completed QA/QC of WEAP training brochure. Will oversee paleontological resource monitoring and reporting for construction for CEQA compliance. Paleontologically sensitive geologic units: Atascadero and Pismo Formations. Working closely with paleontology staff (Chris Shi). Client: RTA Harbor Terrace, LLC for County of San Luis Obispo.

Western San Bernardino County Distribution System Infrastructure Protection Program (DSIPP), San Bernardino County, California. Paleontology Program Manager (2019–present). Overseeing completion of paleontological resource assessment for O&M activities throughout the Programmatic Footprint (74 miles of pipeline, 392 pipeline structures, and approximately 50 miles of patrol roads through 10 cities) as well as within work areas for 13 individual Capital Investment Plan (CIP) projects. Paleontologically sensitive geologic units: Early Holocene or older axial-channel deposits, alluvial fan deposits; Undetermined sensitivity: Miocene-age unnamed fault-bounded conglomerate and sandstone unit. Completing for CEQA compliance (Metropolitan Water District of Southern California). Working closely with paleontology staff (Chris Shi). Client: Dudek.

Professional Experience (continued)

- 2000–2003, Director, Cultural Resources Management, HDR Engineering, Inc.
- 1996–2000, Director, Cultural Resources Management, Braun Intertec Corporation, Inc.
- 1994–1996, Statewide Inventory Coordinator, Minnesota State Historic Preservation Office
- 1993–1994, Staff Archaeologist, Institute for Minnesota Archaeology
- 1991–1993, Independent Contractor—Paleoecology
- 1990, Co-Director, Geoarchaeological Field School, Southern Illinois University, Edwardsville
- 1987–1990, Graduate Research Assistant, Limnological Research Center, University of Minnesota
- 1984–1987, Graduate Research Assistant, Archaeometry Laboratory, University of Minnesota
- 1983–1984, Research Assistant, Crustal Dynamics Project, Geology & Geophysics Branch, NASA Goddard Space Flight Center
- 1987, 1984, Assistant Geoarchaeologist, Tel Miqne Excavations, ASOR-Albright Institute, Jerusalem, Israel
- 1983, Summer Intern, US Bureau of Land Management, Phoenix District, Arizona
- 1983, Teaching Assistant – Evolution of the Earth, Beloit College Geology Department
- 1983, Research Assistant – Palynomorphs (Acritarchs), Beloit College Geology Department

Selected Project Experience (continued)

Improvements to the Avenue 50 and Jackson Street Intersection, City of Indio, Riverside County, California. Paleontology Program Manager (2019–present). Oversaw completion of ground-surface reconnaissance field survey and will provide QA/QC of paleontological technical memorandum for CEQA compliance. Paleontologically sensitive geologic units: Lake Cahuilla beds. Client: Albert A. Webb Associates for County of Riverside.

Replacement of Two Timber Railroad Avenue Bridges near the Community of Whitewater, Riverside County, California. Paleontology Program Manager and Project Manager (2019–present). Oversaw preparation and completed QA/QC of paleontological technical memorandum for replacement of the Railroad Avenue Bridge over Fornat Wash (Bridge Number 56C0099) and the Railroad Avenue Bridge over East Channel Stubbe Wash (Bridge Number 56C0101) within a 4.5-acre Project area. Paleontologically sensitive geologic units: Older Alluvial Deposits, Palm Spring Formation, and Imperial Formation. Completed for NEPA (Caltrans) and CEQA (County) compliance. Worked closely with paleontology staff (Chris Shi). Client: WSP for Caltrans District 8.

Fresno Meat-Rendering Plant, City of Fresno, Fresno County, California. Paleontology Program Manager (2019–present). Overseeing completion of preconstruction paleontological survey of 10 acres and letter report. Paleontologically sensitive geologic units: Pleistocene nonmarine and Quaternary nonmarine alluvial fan deposits. Completing for CEQA compliance (City). Working closely with paleontology staff (Chris Shi). Client: Darling Ingredients, Inc.

Santa Ana River Trail—Phase 6 through Green River Golf Course, Orange-San Bernardino County Line to City of Corona, Riverside County, California. Paleontology Program Manager (2019–present). Overseeing preparation and completing QA/QC of combined paleontological identification report/paleontological evaluation report (PIR/PER) for two possible Santa Ana River Trail (SART) alignments, a short segment linking SART—Phase 5 to SART—Phase 3, and a small staging area. Project included field surveys for paleontological resources. Completing for CEQA compliance (Riverside County Transportation Commission). Working closely with paleontology staff (Chris Shi). Client: Michael Baker International.

Wastewater Collection and Treatment Improvements, Community of Franklin-Beachwood, Merced County, California. Paleontology Program Manager (2019–present). Overseeing preparation and completing QA/QC of paleontological resource identification letter report for the approximately 67-acre project area for CEQA compliance (Franklin County Water District). Paleontologically sensitive geologic units: Riverbank and Modesto Formations. Working closely with paleontology staff (Chris Shi). Client: Quad Knopf, Inc.

Other Paleontological Research

Ph.D. Dissertation

Changing Landscapes in the American Bottom (USA): An Interdisciplinary Investigation with an Emphasis on the Late-Prehistoric and Early-Historic Periods. Advisor: Herbert E. Wright, Jr.

M.S. Thesis

A Study of Phytoliths from Philistine Levels at Tel Miqne (Ekron), Israel. Advisor: George R. Rapp, Jr.

B.S. Theses

The High Diversity of the Mazon Creek Biota: The Result of Excellent Preservation in a Deltaic Environment. Advisor (Geology): Carl Mendelson.

The Role of Man in the Pleistocene Extinction of Large Mammals. Advisor (Anthropology): Daniel Shea.

Selected Project Experience (continued)

Santa Margarita Ranch Agricultural Subdivision Project, San Luis Obispo County, California. Paleontology Program Manager (2019–present). Oversaw preparation and completed QA/QC of paleontological resource impact mitigation program (PRIMP). Will oversee preconstruction worker environmental awareness program (WEAP) training, paleontological resource monitoring, and reporting. Paleontologically sensitive geologic units: Monterey, Santa Margarita, and Paso Robles Formations and older Quaternary alluvium. Completing for CEQA compliance (County). Working closely with paleontology staff (Chris Shi). Client: Kirk Consulting for Santa Margarita Ranch, LLC.

Fairmead Landfill Expansion, City of Chowchilla, Madera County, California. Paleontology Program Manager (2019–present). Overseeing preconstruction WEAP training and construction monitoring over the 23-acre Project area immediately adjacent to the paleontologically diverse Fairmead Locality (Pleistocene, Irvingtonian). Also will oversee post-construction monitoring report. Paleontologically sensitive geologic units: Modesto, Riverbank, and Turlock Lake Formations. Completing for CEQA compliance (County). Working closely with paleontology staff (Chris Shi, Blake Bufford, and Michael George). Client: County of Madera.

Port of Long Beach Master Plan Update, City of Long Beach, Los Angeles County, California. Paleontology Program Manager (2019). Overseeing preparation and providing QA/QC of paleontological resource sections of the Program Environmental Impact Report (PEIR) for the Port Master Plan Update (PMPU) for CEQA compliance. Paleontologically sensitive geologic units: Pleistocene-age sedimentary deposits of the continental shelf and possibly also Late Pleistocene- to Holocene-age young alluvium. Working closely with paleontology staff (Chris Shi). Client: Leidos for Port of Long Beach.

First Street Village Development, Burbank, Los Angeles County, California. Paleontology Program Manager (2019–present). Overseeing pre-construction WEAP training and paleontological resource construction monitoring for CEQA compliance (City). Paleontologically sensitive geologic units: Quaternary alluvium. Working closely with paleontology staff (Chris Shi). Client: First Street Village LLC to City of Burbank.

Bellota-Warnerville 230 kV Reconductoring Project, San Joaquin and Stanislaus Counties, California. Paleontology Program Manager (2019–present). Completed paleontology sections of draft Proponent's Environmental Assessment (PEA); also oversaw preparation and completed QA/QC of field survey and Paleontological Field Survey Report (PFSR) for CEQA compliance for the 23-mile-long project. Paleontologically sensitive geologic units: Modesto, Riverbank, Turlock Lake, Mehrten Formations and possibly also the Laguna Formation. Worked closely with paleontology staff (Chris Shi and Richard Serrano). Client: Stantec for California Public Utilities Commission (CPUC).

Selected Project Experience (continued)

CEMEX Rockfield Modification Project, City of Fresno, Fresno County, California. Paleontology Program Manager (2019–present). Oversaw preparation and completed QA/QC of paleontological technical memorandum for expansion of current aggregate mining and processing operations at quarry and plant sites within a 490.5-acre Project area. Paleontologically sensitive geologic units: Modesto, Riverbank, Turlock Lake, and Tulare Formations. Completed for NEPA and CEQA compliance. Worked closely with paleontology staff (Chris Shi). Client: Buada Associates, Inc. for U.S. Army Corps of Engineers and California Public Utilities Commission (CPUC).

City of Fresno Cannabis Ordinance Environmental Impact Report, Fresno County, California. Paleontology Program Manager (2019–present). Oversaw preparation and completed QA/QC of paleontological technical memorandum to assist with evaluation of the proposed regulation and permitting of commercial cannabis activities with a focus on land-use areas within the City capable of supporting cultivation, distribution, manufacturing, testing, and retail facilities with an 800-foot buffer from other cannabis retailers, schools, daycare centers, and other youth facilities. Paleontologically sensitive geologic units: Modesto, Riverbank, Tulare, and Turlock Lake Formations. Completed for CEQA compliance (City). Worked closely with paleontology staff (Scott Rohlf). Client: Quad Knopf, Inc.

Interstate 10 Eastbound Truck Climbing Lane Improvement Project, City of Yucaipa, San Bernardino County and City of Calimesa, Riverside County, California. Paleontology Program Manager (2019–present). Oversaw preparation and completed QA/QC of paleontological technical memorandum for improvements to a total of 3 miles of existing six-lane eastbound I-10 by adding a truck-climbing lane (TCL) from the 16th Street Overcrossing Bridge to 0.2 mile east of the County Line Road Undercrossing Bridge by paving the existing median. Paleontologically sensitive geologic units: San Timoteo Formation and Pleistocene-age alluvial deposits, and possibly also pre-Pliocene Mill Creek Formation/Potato Sandstone. Completed for NEPA and CEQA compliance (Caltrans and San Bernardino County Transportation Authority). Worked closely with paleontology staff (Chris Shi). Client: HDR.

Pacific Gas and Electric Company (PG&E) Groundwater Remediation, Hinkley, San Bernardino County, California. Paleontology Program Manager and Project Manager (2018–present). Over a multiyear period, completing Release-To-Construction (RTC) project-by-project reviews for cultural and paleontological resource management. Tasks include assessing project areas for sensitivity for cultural and paleontological resources, previously surveyed areas, and recorded locations of cultural resources. Also overseeing cultural and paleontological construction monitoring on a project-by-project basis. Requires project-specific reporting, annual reporting, regular client communication, and coordination with cultural and paleontological staff. Paleontologically sensitive geologic units: Pleistocene alluvium and Middle to Late Pleistocene lacustrine deposits associated with Pluvial Harper Lake. Reports to date include Paleontological Resource Monitoring Report: Installation of Extraction Well 66 (EX-66); Cultural and Paleontological Resources Findings Report: Installation of monitoring Well 44S (SC-MW-44S); and 2018 Annual Report—all co-authored with Chris Shi. Completing for CEQA compliance. Client: Arcadis for PG&E.

Menifee Town Center – Parcels 13, 14, and 15 Development Project, Riverside County, California. Paleontology Program Manager (2018–present). Oversaw preparation and completed QA/QC of PRIMP covering 13-acre project area. Oversaw completion of construction monitoring and will complete QA/QC of final monitoring report. Paleontologically sensitive geologic units: Middle to Late Pleistocene alluvial fan deposits. Worked closely with paleontology staff (Scott Rohlf, Chris Shi, and Aimee Montenegro). Completing for CEQA compliance. Client: Kristoff Commercial Real Estate to City of Menifee.

Sun Lakes Boulevard Realignment, City of Banning, Riverside County, California. Paleontology Program Manager (2019). Edited and approved Constraints Analysis for paleontological resources within the approximately 14-acre project area. Paleontologically sensitive geologic units: Mt. Eden and San Timoteo Formations, and Quaternary alluvial deposits. Worked closely with paleontology staff (Win McLaughlin, Chris Shi). Client: Albert A. Webb Associates, Inc.

Selected Project Experience (continued)

Madera Travel Center at Avenue 17 and Highway 99 Interchange, Madera County, California. Paleontology Program Manager (2018–present). Co-authored draft Paleontological Resource Mitigation Plan (PRMP) for commercial development of approximately 50 acres. Paleontologically sensitive geologic units: Modesto, Riverbank, and Turlock Lake Formations, and possibly also an unnamed Pleistocene nonmarine sedimentary unit. Oversaw WEAP training and overseeing paleontological resource monitoring for construction. Worked closely with paleontology staff (Scott Rohlf, Chris Shi, and Christopher Shea). Completed for CEQA compliance (City). Client: Love's Travel Stops & Country Stores to Madera County.

Highpark Development Project (formerly Ponte Vista) in San Pedro, City of Los Angeles, Los Angeles County, California. Paleontology Program Manager and Project Manager (2018–present). *Æ* provided multiyear paleontological monitoring during construction of 676 homes on 61.5 acres. Paleontologically sensitive geologic units: San Pedro Formation and Palos Verde Sand. By winter 2018, *Æ* paleontological monitors had documented 26 paleontological localities and recovered 27 large vertebrate specimens along with over 4,000 pounds of additional bulk matrix which yielded thousands of scientifically significant invertebrate fossils and more than 25 small-fraction vertebrate specimens. *Æ* has processed the fossil specimens for permanent curation at the Natural History Museum of Los Angeles County and is preparing a final paleontological monitoring report for compliance with the CEQA (City). Final deliverables will be produced and submitted after *Æ* has received a fully executed Deed of Gift Form from the land developer. Oversaw final fossil preparation and providing QA/QC of monitoring report. Working closely with paleontology staff (Chris Shi). Client: Harridge Development Group (formerly iStar Financial).

500 MW Athos Renewable Energy Project, Riverside County, California. Paleontology Program Manager and Project Manager (2018–2019). Overseeing preparation and providing QA/QC of all paleontological resources tasks. For CEQA compliance (County), Project Area on private and state lands consisted of 3,662 acres, including a 11.1-mile-long by 200-foot-wide generation-tie transmission line corridor and access roads. Desktop study included the Project Area plus a 5-mile-wide buffer (Study Area). Paleontologically sensitive geologic units: moderately bedded Pleistocene nonmarine alluvial gravels and sands, reddish paleosols, and Pinto Formation. Supervised completion of paleontological work plan, reconnaissance-level pedestrian field survey for paleontological resources in addition to paleontological observations of geotechnical trenching, Paleontological Identification Report (PIR), and PRIMP. For NEPA compliance, oversaw Paleontology Resource Assessment (PRA), Potential Fossil Yield Classification (PFYC), and BLM Fieldwork Authorization Request for proposed project components on BLM lands. Working closely with paleontology staff (Chris Shi and Scott Rohlf). Client: IP Athos, LLC and Aspen Environmental Group.

Central Coast Oil and Gas Leasing and Development, California. Principal Investigator (2018–2019). Updated paleontology sections of Affected Environment, Environmental Consequences, and References Cited chapters as well as updated the Administrative Record for 7 alternatives covered in the Resource Management Plan Amendment/FEIS on public lands and split mineral estate lands administered by the US Bureau of Land Management (BLM) across approximately 284,000 acres of surface estate and 793,000 acres of federal mineral estate (12 counties). Utilized BLM's Potential Fossil Yield Classification (PFYC) system for 31 paleontologically significant geologic units. Completed for NEPA (BLM) and CEQA compliance (California Department of Conservation, Division of Oil, Gas, and Geothermal Resources for CEQA). Client: Aspen Environmental Group for BLM.

Banning Electric Utility – Ivy Distribution Substation Project, City of Banning, Riverside County, California. Paleontology Program Manager (2019). Oversaw completion and provided QA/QC of paleontological resource constraints memorandum for CEQA compliance. Paleontologically sensitive geologic units: Pleistocene alluvium. Worked closely with paleontology staff (Win McLaughlin and Chris Shi). Client: Albert A. Webb Associates for City of Banning.

Biola University North Dorm Project: Tennis Courts and Wastewater Treatment Area Expansion, City of La Mirada, Los Angeles County, California. Paleontology Program Manager (2019). Oversaw preparation and

Selected Project Experience (continued)

providing QA/QC of paleontological resource monitoring for construction for CEQA compliance. Paleontologically sensitive geologic units: older Quaternary alluvium. Worked closely with paleontology staff (Chris Shi, Aimee Montenegro). Client: Biola University to City of La Mirada.

Rowland Heights Hotel and Plaza Project, Los Angeles County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of PRIMP for CEQA compliance. Paleontologically sensitive geologic units: Pleistocene alluvium, Puente/Monterey Formation. Worked closely with paleontology staff (Chris Shi). Client: Envicom for County of Los Angeles.

Rados Heacock Environmental Project, City of Moreno Valley, Riverside County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of paleontological technical memorandum for construction of two new industrial buildings on 37.12 acres of vacant land. Paleontologically sensitive Pleistocene-age alluvial deposits are located in the Project area. Completed for CEQA compliance (County). Worked closely with paleontology staff (Scott Rohlf). Client: Albert A. Webb Associates, Inc.

Southern California Logistics Center Project, Victorville, San Bernardino County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of PRA and review of the paleontological resource section of the PEIR for the Victorville Airport for CEQA compliance. Paleontologically sensitive geologic units: Pleistocene-age or older alluvial deposits. Worked closely with paleontology staff (Chris Shi). Client: Michael Baker for City of Victorville.

5401 Telegraph Road Parking Structure, City of Commerce, Los Angeles County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of WEAP training, and paleontological resource monitoring, and oversaw reporting for CEQA compliance. Paleontologically sensitive geologic units: older Quaternary alluvial deposits, but no paleontological resources were observed during construction monitoring. Worked closely with paleontology staff (Chris Shi, Jorge Mendieta). Client: Parkco Building Company.

Duke Perry Street & Barrett Avenue Project in the City of Perris, Riverside County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of paleontological technical memorandum for construct an industrial warehouse and paved parking lot on approximately 7.25 acres. Recommended the creation of a PRIMP since the project area was ranked High B for paleontological sensitivity with nearby Pleistocene vertebrate fossil localities recorded in alluvial deposits similar to those in the Project area. Worked closely with paleontology staff (Chris Shi). Completed for CEQA compliance. Lead agency: City of Perris. Albert A. Webb Associates for Duke Realty. Complete, January 2019.

Cannabis Cultivation Warehouse on Assessor's Parcel 314-160-004, City of Perris, Riverside County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of paleontological technical memorandum for development of 0.93 acres of vacant land. Recommended the creation of a PRIMP since the older Quaternary alluvial deposits in the project area are ranked High B for paleontological sensitivity with nearby Pleistocene vertebrate fossil localities recorded in alluvial deposits similar to those in the Project area. Worked closely with paleontology staff (Chris Shi). Completed for CEQA compliance. Client: Richard Park.

LA Water Wheel Project, Los Angeles County, California. Paleontology Program Manager (2019). Oversaw preparation and completed QA/QC of paleontological technical memorandum for the plan to divert waters from the Los Angeles River to irrigate nearby public parks, and will assist City of Los Angeles with Mitigated Negative Declaration (MND) for CEQA compliance. Paleontologically sensitive geologic units: Pleistocene-age alluvial deposits and the Miocene-age Monterey Formation. Client: Ruth Villalobos & Associates for City of Los Angeles.

State Route (SR) 86/Avenue 50 New Interchange Project, City of Coachella, Riverside County, California. Third-Party Senior Reviewer (2018). Reviewed/rewrote Affected Environment, Environmental Consequences, and Avoidance Minimization, and/or Mitigation Measures paleontology chapters and References Cited chapter (of

Selected Project Experience (continued)

the Initial Study/EA written by Michael Baker International). Paleontologically sensitive geologic units: Late Quaternary Period lacustrine deposits associated with ancient Lake Cahuilla. Completed for NEPA, NHPA, Section 4(f), and CEQA compliance. Client: TranSystems Corporation to Caltrans, District 8.

Rose II Residential Development Project, Romoland, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of PRIMP covering subdivision of 45.6 acres. Paleontologically sensitive geologic units: Middle to Late Pleistocene alluvial fan deposits. Completed for CEQA compliance. Worked closely with paleontology staff (Chris Shi). Client: Pacific Communities Builder, Inc. to County of Riverside.

Sycamore Hills Distribution Center, City of Riverside in Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of Paleontological Resource Assessment covering commercial development of 47.85 acres. No paleontologically sensitive geologic units. Worked closely with paleontology staff (Chris Shi). Completed for CEQA compliance. Client: Ruth Villalobos & Associates, Inc. to County of Riverside.

Temescal Valley Riverside Clinic Investors IV, LLC Project, South of the City of Corona, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of letter report for paleontological resource mitigation monitoring during construction in the 12.5-acre project area. Paleontologically sensitive geologic units: Vaqueros and Sespe Formations, but no paleontological resources observed during construction monitoring. Worked closely with paleontology staff (Chris Shi). Completed for CEQA compliance. Client: Riverside Clinic Investors IV, LLC to County of Riverside.

39527 Colleen Way Mixed-Use Development Project, City of Temecula, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of letter report for paleontological resource mitigation monitoring during construction in the 5.3-acre project area. Paleontologically sensitive geologic units: Pauba Formation, but no paleontological resources observed during construction monitoring. Worked closely with paleontology staff (Scott Rohlf and Christopher Shea). Completed for CEQA compliance. Client: Courie Construction to County of Riverside.

Beach Club Development, Thermal, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of technical memorandum for development of 240 acres of vacant land. Recommended mitigation measures since project area is in High paleontological sensitivity. Paleontologically sensitive geologic units: Late Quaternary Period lacustrine deposits associated with ancient Lake Cahuilla. Worked closely with paleontology staff (Chris Shi and Niranjala Kottachchi). Completed for CEQA compliance. Client: Albert A. Webb Associates to County of Riverside.

500 kV Ten West Link Transmission Connection, Maricopa County, Arizona to Riverside County, California. Paleontology Program Manager and Project Manager (2018). Oversaw preparation and completed QA/QC of PRA for the entire 114-mile-long preferred alignment and alternatives. Utilized BLM's PFYC system. Paleontologically sensitive geologic units: Paleozoic sedimentary rocks, Bouse and Chemehuevi Formations, Bullhead Alluvium and Older Quaternary Alluvium (e.g., Palo Verde Alluvium); and Cenozoic sedimentary rocks have Unknown Potential. Worked closely with paleontology staff (Scott Rohlf, Chris Shi, and Christopher Shea). Completed for NEPA and CEQA compliance. Client: DCR Transmission LLC to BLM and California Public Utilities Commission (CPUC).

Talavera Pipeline Replacement, City of Indio, Riverside County, California. Paleontology Program Manager (2018). Total project length: 5.7 miles. Oversaw preparation and completed QA/QC of paleontological resource technical memorandum for CEQA compliance. Paleontologically sensitive geologic units: Older Quaternary Alluvium. Worked closely with paleontology staff (Scott Rohlf, Christopher Shea, Chris Shi). Client: Albert A. Webb Associates to Coachella Valley Water District.

Blythe Airport Perimeter Fence Project, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of paleontological resource technical memorandum on

Selected Project Experience (continued)

approximately 700 acres. Paleontologically sensitive geologic units: Late to Middle Pleistocene Old Terrace Deposits, and possibly also Middle to Early Pleistocene Very Old Alluvial Deposits at depth. Worked closely with paleontology staff (Scott Rohlf and Christopher Shea). Completed for NHPA and CEQA compliance. Client: Mead & Hunt to Federal Aviation Administration (FAA) and Riverside County Economic Development Agency.

Madison Avenue Improvements Project, City of Murrieta, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of the PRA, including identification survey for the Project and Constraints Analysis for the Warm Springs Creek Bridge Crossing for CEQA compliance (City). Paleontologically sensitive geologic units: Young Surficial Deposits, especially pre-Holocene, and Very Old Surficial Deposits, including the Pauba Formation. Worked closely with paleontology staff (Scott Rohlf and Chris Shi). Client: Kleinfelder to City of Murrieta Public Works & Engineering.

Duke Development on the Northwest Corner of Alabama Street & Palmetto Avenue, City of Redlands, San Bernardino County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of paleontological resource technical memorandum on approximately 55 acres. Paleontologically sensitive geologic units: Late to Middle Pleistocene alluvial deposits (e.g., Very Old Axial-Channel deposits). Worked closely with paleontology staff (Scott Rohlf and Christopher Shea). Completed for CEQA compliance. Client: Albert A. Webb Associates to County of San Bernardino.

I-10 Monroe Interchange Project, Riverside County, California. Paleontology Program Manager (2018). Oversaw preparation and completed QA/QC of PIR for CEQA compliance. Included paleontological field surveys of two design alternatives over a total of approximately 73 acres. Paleontologically sensitive geologic units: Quaternary, especially pre-Holocene, fluvial deposits and possibly also Lake Cahuilla lacustrine deposits at depth. Worked closely with paleontology staff (Scott Rohlf and Christopher Shea). Client: Michael Baker to Caltrans, District 8.

Water-Main Replacement Project along the San Gorgonio River, City of Banning, Riverside County, California. Paleontology Program Manager (2018). Total project length: 6.5 miles. Oversaw paleontological spot-check monitoring and reporting for water mainline replacement on private lands for CEQA compliance. Paleontologically sensitive geologic units: San Timoteo Formation and Quaternary older alluvium, but no paleontological resources were observed during construction monitoring. Worked closely with paleontology staff (Scott Rohlf and Christopher Shea). Will also oversee full-time monitoring and reporting in high-sensitivity areas on US Forest Service (USFS) lands for compliance with the Omnibus Public Land Management Act. Client: Aspen Environmental Group to City of Banning Public Works Department.

De Anza Sewer Force Main Project, City of San Jacinto, Riverside County, California. Paleontology Program Manager (2018). Total project length: 7,500 linear feet. Oversaw creation of informational brochure for construction-worker sensitivity training for Worker Environmental Awareness Program (WEAP) compliance. Also oversaw coordination and completion of spot-check monitoring. Completed senior review and QA/QC for paleontology mitigation monitoring letter report. Paleontologically sensitive geologic units: older Quaternary deposits, but no paleontological resources were observed during construction monitoring. Worked closely with paleontology staff (Christopher Shea). All completed for CEQA compliance. Client: HELIX to Eastern Municipal Water District.

Sixth Street Park, Arts, River & Connectivity (PARC) Improvements, City of Los Angeles, Los Angeles County, California. Paleontology Program Manager (2018). Completed QA/QC of paleontological resource technical memorandum for CEQA compliance. Paleontologically sensitive geologic units: Middle to Late Pleistocene alluvial deposits, Late Miocene- to Early Pliocene-age Puente Formation, and Early Pliocene- to Early Pleistocene-age Fernando Formation. Worked closely with paleontology staff (Scott Rohlf). Client: GPA Consulting to City of Los Angeles Bureau of Engineering.

Hay Lake and McFarland Parcels Land Exchange, Cook and St. Louis Counties, Minnesota. Principal Investigator (2010). Researched and summarized Existing Conditions of paleontological resources for DEIS. Completed for NEPA compliance. Client: PolyMet Mining to USFS, Superior National Forest.

Selected Project Experience (continued)

Collaborative Research: Deltaic Resilience and the Genesis of Mesopotamian Cities (Iraq) Project. Phytolith Analyst (2014). Completed phytolith analysis and reporting about mudbrick samples from the archaeological site of Ur after overseeing chemical processing. Client: Dr. Jennifer Pournelle, Principal Investigator, University South Carolina Research Foundation.

Geological Background Research for the Naval Industrial Reserve Ordnance Plant (NIROP) Superfund Cleanup Project, City of Fridley, Hennepin County, Minnesota. Staff Geologist (2014). Compiled and examined boring logs and identified stratigraphic contacts for 3D modeling at the 83-acre site located about 700 feet east of the Mississippi River. Research completed for compliance with the US Clean Water Act (CWA). Client: US Navy.

Multiple Projects as Independent Contractor. Paleoecologist (1991–1993). Distinguished the post-contact cultural horizon using pollen analysis for Dr. Daniel Engstrom (University of Minnesota) and Minnesota Pollution Control Agency (MPCA) for projects in Lake St. Croix (MN-WI border) and Duluth-Superior Harbor (MN-WI border). Collected modern pollen samples and made reference slides of Upper Midwest pollen taxa for Dr. Greg McDonald (Cincinnati Museum of Natural History & Science, Ohio). Processed sediment samples from the Island of Madeira and analyzed phytoliths for Dr. Glenn Goodfriend (Carnegie Institution, Washington, D.C.).

Geoarchaeological Field School at Cahokia Mounds State Historic Site (UNESCO World Heritage Site), Collinsville, Illinois. Co-Director (1990). Lectured on paleoecological research and geoarchaeology, led wetland-coring & laboratory activities, participated in remote sensing field and laboratory activities. Co-Director: Dr. Rinita Dalan.

Limnological Research Center, University of Minnesota, Minneapolis. Graduate Research Assistant (1987–1990). Conducted analyses of pollen and other appropriate material from lake-sediment and peat cores. Supervisors: Dr. Herbert Wright, Jr. and Dr. Linda Shane.

Archaeometry Laboratory, University of Minnesota, Duluth. Graduate Research Assistant (1984–1987). Conducted sediment grain-size analyses, processed and identified phytoliths and pollen, assisted in publication, obtained literature about sediment studies, performed various office duties. Supervisor: Dr. George (Rip) Rapp, Jr.

Crustal Dynamics Project, Geology & Geophysics Branch, NASA Goddard Space Flight Center, Greenbelt, Maryland. University of Maryland Research Assistant (1983–1984). Correlated geologic features with satellite magnetic anomalies (MAGSAT) and researched the crustal structure and composition of each feature for Principal Investigator (Dr. Herbert Frey).

Tel Miqne (Ekron) Excavations, American Schools of Oriental Research, Israel. Assistant Geoarchaeologist and Project Archaeologist (1984, 1987). Assisted the Project Geoarchaeologist (Dr. Arlene Rosen) in all phases of field and laboratory studies during spring-summer excavations. **1987 season** involved all phases of grain-size studies, including collection, processing, microscopic analysis, and data analysis; also assisted with on-site geological problems and flotation procedures. **1984 season** involved assistance with wadi stratigraphy studies, on-site geological problems, flotation procedures, and grain-size analyses.

Selected Publications

Ollendorf, Amy L., 1994, New Paleoecological Data Pertaining to the Late Holocene in the American Bottom, USA. *Program and Abstracts of the 13th Biennial Meeting of the American Quaternary Association*, University of Minnesota, Minneapolis, p. 236.

Ollendorf, Amy L., 1993, Review of R.R. Brooks and D. Johannes, *Phytoarchaeology*, Portland, OR: Dioscorides Press. *American Antiquity* 58(4):763-764.

Ollendorf, Amy L., 1993, Toward a Classification Scheme of Sedge (Cyperaceae) Phytoliths, In G. Rapp, Jr. and S.C. Mulholland, eds., *Phytolith Systematics: Emerging Issues.* Plenum Press, p. 91-111.

Selected Publications (continued)

Mulholland, Susan C., Rapp, George Jr., Ollendorf, Amy L., and Regal, R., 1990, Variation in Phytolith Assemblages within a Population of Corn (cv. Mandan Yellow Flour), *Canadian Journal of Botany* 68:1638-1645.

Ollendorf, Amy L., Mulholland, Susan C., and Rapp, George Jr., 1988, Phytolith Analysis as a Means of Plant Identification: *Arundo donax* and *Phragmites communis*. *Annals of Botany* 61:209-214.

Mulholland, Susan C., Rapp, George Jr., and Ollendorf, Amy L., 1988, Variation in Corn Phytolith Assemblages. *Canadian Journal of Botany* 66:2001-2008.

Ollendorf, Amy L., Mulholland, Susan C., and Rapp, George Jr., 1987, Phytoliths from Some Israeli Sedges. *Israel Journal of Botany* 36:125-132.

Ollendorf, Amy L., Mulholland, Susan C., and Rapp, George Jr., 1987, A New Apparatus for the Digestion of Plants in Phytolith Analysis. *Phytolitharien Newsletter* 5(1):13-16.

Ollendorf, Amy L., 1986, Tel Miqne, Israel - Phytoliths from Philistine Levels. *Old World Archaeology Newsletter* 10(2):16.

Ollendorf, Amy L., 2000, "Pollen Analysis." Assisted Dr. Edward Cushing (Univ. of MN) by helping train health professionals during weekend seminar sponsored by Multidata Corporation. **Invited.**

Selected Presentations

Ollendorf, Amy L., 1999, "Pollen Analysis." Assisted Dr. Edward Cushing (Univ. of MN) by helping train health professionals during weekend seminar sponsored by Multidata Corporation. **Invited.**

Ollendorf, Amy L., 1997, "Sneezing, Wheezing, and the Study of Fossil Pollen: What this Allergenic Material Can Tell Us About the Past." Guest lecture at the *Annual Meeting of the Materials Information Society - Minnesota Chapter of the American Society of Metallurgists International*, Minneapolis, Minnesota. **Invited.**

Ollendorf, Amy L., 1997, "Paleoecological Research at Cahokia." Guest lecture for *Minnesota Archaeology Week and Hamline University Anthropology Club*, St. Paul, Minnesota. **Invited.**

Ollendorf, Amy L., 1994, "New Paleoecological Data Pertaining to the Late Holocene in the American Bottom, USA." *Program and Abstracts of the 13th Biennial Meeting of the American Quaternary Association*, University of Minnesota, Minneapolis, p. 236.

Ollendorf, Amy L., 1993, "Paleoecology and Culture Change in the American Bottom, USA." *58th Annual Meeting of the Society for American Archaeology*, St. Louis, Missouri.

Ollendorf, Amy L., 1993, "Recent Paleoecological Doctoral Research in the American Bottom." Guest lecture in the *Illinois State Museum Lunchtime Lecture Series*, Springfield, Illinois. **Invited.**

Ollendorf, Amy L., 1991, "The Decline of the Mississippian Occupation of Cahokia: An Interdisciplinary Investigation of Landscape Changes in the American Bottom (USA)." *24th Annual Chacmool Conference*, University of Calgary, Alberta, Canada.

Ollendorf, Amy L. and Wright, H.E. Jr., 1989, "Landscape Changes Associated with Urbanization in Temperate Europe." *1st Joint Archaeological Congress*, Baltimore, Maryland. **Invited.**

Ollendorf, Amy L., 1988, "Comparison of Sedge Phytoliths from Widely Separated Geographic Areas, With an Emphasis on Israel." *3rd Annual Phytolith Workshop*, University of Missouri-Columbia.

Ollendorf, Amy L., 1986, "Phytoliths from Philistine Occupation Surfaces at Tel Miqne (Ekron), Israel." *51st Annual Meeting of the Society for American Archaeology*, New Orleans, Louisiana.

MELISSA K. MACIAS

Senior Paleontologist/Project Manager

Education

M.S., Geosciences, in progress, Fort Hays State University, expected Fall 2020

B.S., Earth Sciences, 2013, University of California, Santa Barbara

A.A., Earth and Planetary Sciences, Santa Barbara City College

Registrations/Certifications

- Certified Paleontologist, Orange County (2016–present)
- Qualified Paleontologist, Riverside County (2019–present)

Professional Experience

- 2020–present, Senior Paleontologist / Project Manager, Applied EarthWorks, Inc.
- 2015–2020, Paleontologist, Psomas
- 2015, Paleontological Monitor, Duke CRM
- 2013–2015, Graduate Teaching Assistant, Fort Hays State University
- 2015, Graduate Curatorial Assistant, Sternberg Museum of Natural History
- 2008–2013, Undergraduate Teaching Assistant, Santa Barbara City College

Other Paleontological Research

M.S. Thesis. *Paleobiogeography of North American Giant Ground Sloths*. Advisor: Dr. Laura Wilson

B.S. Thesis (2013). *Late Pleistocene megafauna localities at Vandenberg Air Force Base.* Advisor: Dr. Andre Wyss

Summary of Qualifications

Melissa Macias has five years of experience with CEQA and NEPA compliance as well as conducting and managing paleontological resource impact assessments. Melissa has worked on paleontological resources impact mitigation programs that have required monitoring of earth-moving activities, recovery and preparation of fossil remains for collections, field personnel supervision, laboratory analysis of paleontological specimens, and final report preparation. In addition to experience in Southern California, Ms. Macias also has paleontology experience in Utah and Montana and extensive geology experience in Utah and Colorado.

Selected Project Experience

Bloomington Business Park Project, San Bernardino County, California. Senior Paleontologist (2020–present). Completed paleontological technical memorandum for Sites 3 and 4. Paleontologically sensitive geologic units: Quaternary older alluvium. Completed for CEQA compliance (County). Working closely with paleontology staff (Chris Shi and Amy Ollendorf). Client: Howard Industrial Partners.

Paleontological Sensitivity GIS Mapping Project. Senior Paleontologist (2020–present). Creating a statewide paleontological sensitivity GIS database using existing geologic maps and Society of Vertebrate Paleontology guidelines. The database will be used to determine baseline sensitivities for current and upcoming projects.

Frank R. Bowerman Landfill Phase VIIIB-1 Landfill Buttress and Liner Project, City of Irvine, Orange County, California. Field Paleontologist (2016–2020). Completed paleontological monitoring of grading and excavation areas and cataloging new fossil localities; screen-washed sediment for small-fraction fossils; prepared jacketed material in the field; and prepared paleontological monitoring report as a condition of environmental mitigation completed for the buttress and liner installation implemented for the existing landfill. Paleontologically sensitive geologic units: Sespe, Vaqueros, Topanga, and Puente Formations. Completed as Psomas employee for CEQA compliance (County). Client: Orange County Waste & Recycling.

Lincoln Bridge Multi-Modal Improvements (LA TOS 27), City of Los Angeles, Los Angeles County, California. Paleontologist (2019–2020). Prepared PIR/PER for the widening of Lincoln Boulevard from Fiji Way to Jefferson Boulevard, including replacement of the Lincoln Boulevard Bridge over Ballona Creek, and replacement of the Culver Boulevard overpass. Paleontologically sensitive geologic units: Quaternary older alluvium. Completed as Psomas employee for CEQA compliance (Caltrans). Client: City of Los Angeles.

Selected Project Experience (continued)

Maywood Mutual Water Company No. 3 Water Quality Improvements, Cities of Maywood, Bell, and Vernon, Los Angeles County, California. Paleontologist (2019). Assisted in the preparation of an IS/MND for proposed rehabilitation of an approximate 450,000-gallon welded steel tank and associated tank appurtenances; replacement of approximately 4,600 feet of pipe segment; numerous valve replacements; and multiple fire hydrant repair and replacements. Supplemental documentation also was created to follow Federal Crosscutter Regulations and California State Water Resources Control Board requirements. Paleontologically sensitive geologic units: Quaternary older alluvium. Completed as Psomas employee for CEQA (Metropolitan Water District of Southern California) compliance. Client: Maywood Mutual Water Company.

Irvine Lake Pipeline Conversion Project, City of Irvine, Orange County, California. Paleontologist (2017–2018). Assisted in the preparation of an IS/MND for the conversion of the northern segment from an untreated water pipeline to a recycled water pipeline. Also provided cross-trained monitoring. Paleontologically sensitive geologic units: Puente Formation. Completed as Psomas employee for CEQA (County) compliance. Client: Irvine Ranch Water District.

La Palma Recharge Basin, City of Anaheim, Orange County, California. Paleontologist (2015–2016). Along with a Native American representative, provided monitoring for grading of the recharge basin. Paleontologically sensitive geologic units: Quaternary older alluvium. Completed as Psomas employee for CEQA compliance (County). Client: Orange County Water District.

Merrill Avenue Brownstones Mixed-Use Development, City of Riverside, Riverside County, California. Paleontologist (2017). Assisted in the preparation of an IS/MND for the proposed mixed-use development with a total floor area of 98,608 SF and consisting of 108 dwelling units and associated amenities and an additional 1,200 SF of retail space to be located on the ground floor. In addition, the Merrill Avenue street section would be modified to provide on-street parking immediately adjacent to the project site. The IS/MND addressed impacts related to noise, vibration, pollutant emissions, and toxic emissions associated with train activity on the tracks north of the site, as well as the traffic impacts from the narrowing of Merrill Avenue and during the holiday season at the Riverside Plaza shopping center to the south. Paleontologically sensitive geologic units: Quaternary older alluvium. Completed as Psomas employee for CEQA (City) compliance. Client: Pelican Communities, LLC.

Eiko's Elephant Graveyard (EEG) Quarry, Vandenberg Air Force Base (AFB), Santa Barbara County, California. Field Crew Chief (2013–present). Completed field and lab work involving fossil specimens of Pleistocene-age giant ground sloths recovered from the quarry. Conducted paleontological research and supervised a crew of students and AFB staff volunteers for the collection of vertebrate fossils, and taphonomic and stratigraphic data. This site was discovered during a 2013 survey of fossil localities. Also gave presentations on this research to multiple groups, including youth scouts and professional scientists. Paleontologically sensitive geologic units: Quaternary older alluvium. Initial work completed as an Undergraduate Honor's Thesis and work ongoing as a volunteer with the Earth and Planetary Sciences Department of Santa Barbara City College. Client: Vandenberg AFB.

Cojo-Jalama Ranches (Bixby Ranch) Project, Unincorporated Santa Barbara County, California. Paleontology Assistant (2013). Assisted with the preparation of an EIR. Duties for this job included field identification of invertebrate and vertebrate fossils and their associated rocks; completion of surveys on remote field sites; and assessment of the paleontological significance of the study area. Melissa also created maps, diagrams, and figures and edited the final report. Paleontologically sensitive geologic units: Quaternary older alluvium, Monterey Formation, Jalama Formation. Project work completed as a RS Gray Consulting employee for CEQA (CA Coastal Commission) compliance. Client: Cojo-Jalama Ranches.

Fort Hays State University, Hays, Kansas. Graduate Teaching Assistant/Curatorial Assistant (2013–2015). Taught introductory, physical, and historical geology lab courses. Also assisted with teaching the summer field geology course, where her duties included maintaining a base camp, driving, and assisting students on geology

Selected Project Experience (continued)

projects in eastern Utah and western Colorado. Also assisted with graphic design of departmental flyers, organized departmental events, worked in the department GIS lab, and tutored students in various geology courses. As a curatorial assistant at Sternberg Museum of Natural History, digitized vertebrate and invertebrate collections databases, cataloged loans, and digitized a specimen loan document database.

Selected Presentations

Macias, M. K. 2019. Whales n' snails: a potential Miocene shallow marine whale fall community. North American Paleontological Convention.

Macias, M. K. 2019. Biostratigraphy and faunal analysis of a late Pleistocene megafauna quarry at Vandenberg Air Force Base, Santa Barbara County, California. Western Association of Vertebrate Paleontology. 2019 Annual Meeting Abstract Booklet.

Macias, M. K. 2018. Three's a crowd: spatial analysis of multi-taxa sloth localities. Journal of Vertebrate Paleontology. 2018 Annual Meeting Abstract Booklet. Page 173.

Macias, M. K., Roeder, M. A. 2017. An early Miocene mobulid locality from the Frank R. Bowerman Landfill, Irvine, California: The importance of mitigation paleontology and its implications for mobulid paleobiogeography. Journal of Vertebrate Paleontology. 2017 Annual Meeting Abstract Booklet. Page 155.

Macias, M. K. 2015. GIS analysis of North American giant ground sloth (Xenarthra: Pilosa) paleobiogeography. Journal of Vertebrate Paleontology. 2015 Annual Meeting Abstract Booklet. Page 170.

Kitao, E. B., Macias, M. K. 2015. Depositional environment and taphonomic analysis of a *Paramylodon harlani* (Xenarthra: Pilosa) quarry at Vandenberg Air Force Base, Santa Barbara, California. Journal of Vertebrate Paleontology. 2015 Annual Meeting Abstract Booklet. Page 155.

Macias, M. K. 2015. Paleobiogeography of giant ground sloths (Xenarthra: Pilosa) in North America. Kansas Academy of Sciences annual meeting 2015.

Macias, M. K., E. B. Kitao, R. S. Gray. 2014. New Pleistocene megafauna localities in Santa Barbara County, California: Paleontological reconnaissance of the marine terrace deposits at Vandenberg Air Force Base. American Association of Petroleum Geologists, Pacific Section annual meeting. Search and Discovery Article #90191 (2014).

Macias, M. K. 2014. Island sloths: the effects of tectonics and vicariance on Pleistocene Caribbean sloth speciation. John Heinrichs Scholarly and Creative Activities Day, Fort Hays State University, April 2014

Macias, M. K., E. B. Kitao, R. S. Gray. 2013. New Pleistocene megafauna localities in Santa Barbara County, California: Paleontological reconnaissance of the marine terrace deposits at Vandenberg Air Force Base. Journal of Vertebrate Paleontology. 2013 Annual Meeting Abstract Booklet. Page 167.

MICHAEL GEORGE

Paleontological Field/Lab Technician

Education

B.S., Geology, California State University, Stanislaus, 2018

A.S., Geology, Merced Junior College, 2014

Professional Experience

2019–present, Paleontological Field/Lab Technician, Applied EarthWorks, Inc., Fresno, California

2017-present, Lead Paleontologist/Fossil Collections Manager, Fossil Discovery Center of Madera County, Chowchilla, California

2015-2017 Undergraduate Research Assistant to Dr. Julia Sankey (Paleontologist), Geology Department, CSU, Stanislaus, California

2015-2016, Fossil Preparation Assistant to Dr. Julia Sankey (Paleontologist), Geology Department, CSU, Stanislaus, California

Summary of Qualifications

Mr. George has been trained formally as a geologist who specializes in paleontology. To date, he has completed more than 100 hours of field and laboratory training in the Earth sciences and more than 100 hours of fossil preparation. He has experience measuring stratigraphic sections, describing sedimentary geologic units, creating geologic cross-sections, and writing field reports. He completed a geological field school at California State University (CSU), Stanislaus in 2018 which provided him with experience in field mapping and exposure to the geology of the Central Valley, Sierra Nevada Mountains, Mojave Desert, Peninsular Ranges, and Coast Ranges. Mr. George also has basic knowledge of GPS equipment, ArcGIS v.10.4, and AutoCAD v.16.2.

Project Experience

California High-Speed Rail Construction Package 1, Madera and Fresno Counties, California. Paleontological Field Technician (2020-present). Æ is providing multi-year paleontological monitoring during construction of the 32-mile segment from Avenue 19 in Madera County to East American Avenue in Fresno County. The segment includes 12 grade separations, two viaducts, one tunnel, and a major crossing over the San Joaquin River. Completing paleontological resource monitoring and geologic data collecting during construction. Paleontologically sensitive geologic units: undifferentiated Modesto and post-Modesto Holocene-age sediment; Modesto, Riverbank, Turlock Lake, Tulare, Laguna, and Mehrten Formations; North Merced Gravel; and Pleistocene non-marine sediment. Completing for CEQA compliance (California High-Speed Rail Authority) and NEPA compliance (Federal Railroad Administration). Client: Parsons.

Fairmead Landfill Expansion, City of Chowchilla, Madera County, California. Paleontological Field Technician (2019). Completed paleontological resource monitoring and geologic data collecting during construction for 23-acre landfill expansion. Completed for CEQA compliance (County). Paleontologically sensitive geologic units: Turlock Lake Formation. Client: County of Madera.

Fossil Collection from the Fairmead Landfill Locality at the Fossil Discovery Center of Madera County, City of Chowchilla, Madera County, California. Lead Paleontologist/Fossil Collections Manager (2017-present). Cataloged, prepared, and identified fossils collected during construction of the landfill in 1993.

Investigations in the Turlock Lake Formation near the Town of La Grange, Stanislaus County, California. Undergraduate Research Assistant (2015-2017). Assisted Dr. Julia Sankey (CSU Stanislaus geology faculty) by writing research papers and conducting fossil analysis regarding the flora and fauna of the early Pliocene-age Turlock Lake Formation.

Project Experience (continued)

Fossil Collection from the Fairmead Landfill Locality at the University of California Museum of Paleontology (UCMP), Berkeley, California. Fossil Preparation Assistant (2015-2016). Assisted Dr. Julia Sankey (CSU Stanislaus geology faculty) by completing fossil preparation on various fossils in the UCMP Collection recovered during construction of the landfill in 1993.

Publications and Presentations

Sankey, J.T., Biewer, J., Wilson, Whitney, Basuga, Janis, **George, Michael,** Palacios, Francisco, Wagner, Hugh, Hutchison, H., and Garber, Dennis. 2015. Kayaking for Paleo – Relocating and documenting the Turlock Lake fossil sites, upper Mehrten Formation (early Pliocene; Hemphillian LMA), Stanislaus County, California. Society of Vertebrate Paleontology 75th Annual Meeting, Oct. 14-17, 2015, Dallas, Texas, *Journal of Vertebrate Paleontology*, Program and Abstracts, 2015:208.

Sankey, J.T., Biewer, J., **George, M.**, Maldonado, N., Campos, M., Martinez, V., Garner, J., Ocon, J., Snyder, M., Wilson, Whitney, and Monschein, A. 2015. Miocene – Pleistocene geology and Paleobiology of Stanislaus County, California. Western Association Vertebrate Paleontology: Program with Abstracts, February 14, 2015, CSU, Stanislaus, Turlock, California. *PaleoBios* 32(1):14, University of California Press.

George, M., Sankey, J.T., Castle, L., Wilson, W. 2015. The First in Situ Tree Roots from the Upper Mehrten Formation, Turlock Lake, Stanislaus County, California. UC Merced Summer Symposium.

APPENDIX F

Geology and Soils

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APPENDIX F-1

McKay Point Reservoir Project – Geology and Soils Technical Study
(SLR Consulting Limited, 2015)

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global environmental solutions

MCKAY POINT RESERVOIR PROJECT

Geology and Soils Technical Study

SLR Ref: 117.02125.00002

December 2021

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Geology and Soils Technical Study

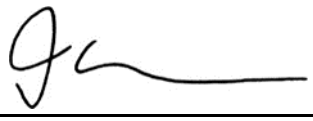
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This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.



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Senior Associate

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1. INTRODUCTION

1.1. BACKGROUND

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (**Owners**) of approximately 500 acres of land adjacent to the Kaweah and St. Johns Rivers in Tulare County, California, commonly referred to as the McKay Point property (**Site**). The Site location is shown in **Figures 1 and 2**.

The Owners propose to develop approximately 200 acres of the total 500-acre McKay Point property on the north side of the divergence of the Kaweah and St. Johns Rivers into a surface water storage and reregulation Reservoir (**Reservoir**).

West Coast Aggregate (WCA) will excavate the Reservoir in accordance with plans and specifications to be developed (**Excavation**). WCA intends to process the resulting aggregate materials (i.e., rock, sand, and gravel) within the Site (**Figures 2 and 3**). WCA would then sell the processed materials.

The Excavation of a pit that will be used for the construction of the reservoir and the Construction / Operation of the Reservoir are the phases collectively referred to as the **Project**. The Reservoir phase of the Project will entail storage and release of surface water only. To minimize groundwater from entering the Excavation and the Reservoir, a subsurface groundwater barrier system (**Slurry Wall**) will be installed around the perimeter to minimize groundwater inflow. While some amount of groundwater inflow will occur during periods when the Reservoir is not full, this inflow will be pumped out and returned to nearby groundwater. The Slurry Wall will also minimize stored water losses from the Reservoir to groundwater when it is full.

The potential impacts of the Project are evaluated from a geotechnical engineering and geology perspective, based on the California Environmental Quality Act (**CEQA**). This report includes an evaluation of impacts related to the Excavation, Reservoir, and Slurry Wall components of the Project. Impact analyses for these elements are based on computer models and other evaluation methods to address the stability of temporary and permanent slopes, dewatering considerations, regional and local geologic conditions, and seismicity.

This report is organized to provide technical input for CEQA document preparation. It includes sections on the environmental setting, general Site conditions, available subsurface information on soils and groundwater, regional and local geology, seismicity, and faulting. The impact of the proposed project on the current conditions are then evaluated, based on our engineering analyses, professional opinions, and our geotechnical engineering related construction know-how. This information is then applied to the proposed development concept and its likely construction scenarios applicable to the different stages of its development. The report concludes by addressing each CEQA significance criteria related to geology and soils. Figures are provided at the end of the report. Further technical details are presented in the Appendices.

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1.2. PROJECT OVERVIEW

The overview of the Project and the geology and soils conditions of the Site is based on our review of documents provided by TID (**Applicant**) or their representatives and consultants, as well as publicly available data and reports. The reviewed documents provide information on geotechnical conditions (BSK, 2011) and groundwater conditions (SLR, 2021; Schmidt, 2012; SES, 2012). Information from other documents listed in the References have also been reviewed and evaluated as part of this assessment.

The Owners propose to construct and operate the Reservoir on the north side of the divergence of the Lower Kaweah and St. Johns Rivers near McKay Point in Tulare County, California (**Figures 2 and 3**).

The Reservoir capacity is expected to be 4,600-acre feet. Its depth is expected to range from approximately 60 to 80 feet. The material excavated during construction will consist of resource-grade aggregate and will be processed at the WCA facility to be setup within the excavation area.

The Excavation and the Reservoir will extend vertically below the groundwater levels. The Applicant will implement dry mining methods to recover the aggregate and to create the Reservoir. Dewatering of the excavated area will be conducted, as necessary to allow for dry mining techniques.

Upon completion of the Reservoir excavation, water will be diverted from the Kaweah River and stored in the Reservoir. When completed, the Reservoir will serve as a surface water storage/re-regulation facility.

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2. ENVIRONMENTAL SETTING

2.1. REGIONAL SETTING

The Site is in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California. The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Central Valley is one of the most productive agricultural regions in the world.

This region is underlain by young and old unconsolidated fluvial deposits (sandy and silty gravels, clayey sand and cobbles, and silty and clayey sands) that originated from the nearby Sierra-Nevada Mountains. These moderately to highly permeable silts, sands and gravels generally extend to depths of several hundred feet or more.

The Site vicinity is drained by the Kaweah River and by the St. Johns River, which drain ultimately to the Tulare Lakebed in the southern end of the San Joaquin Valley. In 1962, Lake Kaweah, located upstream from the Site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced flooding at the Site and the surrounding area.

2.2. LOCAL SETTING

The Site is currently undeveloped and has been used for cattle grazing under lease arrangements. Most of the Site is vegetated with native grasses. Immediately to the north is CEMEX's Lemon Cove Facility. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west. Adjacent lands to the south and east are used intensively for agricultural and, to a limited extent, for rural residential purposes.

The surface soil at the Site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the River split generally to the south and southwest toward the St. Johns River. The Site elevation slopes from approximately 472 feet above mean sea level (msl) at the northeastern end of the property, downward to approximately 454 feet above msl at the southwestern end.

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3. BASELINE GEOLOGIC AND SOIL CONDITIONS

3.1. REGIONAL AND LOCAL GEOLOGY

The Central Valley has been formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west (**Figure 1**). The Central Valley is an alluvial plain approximately 50 miles wide (E-W) and 400 miles long (N-S). Sediments have been deposited into the Central Valley for the last 160 million years and can be thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone and locally granitic rock underlying the alluvium at the Site. Beneath the sedimentary rocks lie an impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000 feet bgs. These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (Faunt et al., 2009). A geologic map of the region is included as **Figure 4**.

The subsurface stratigraphy of the site has been previously explored, evaluated, and reported in several studies, as cited in the References. Excerpts from available documents is reproduced in Appendix A. A total of 6 soil borings were conducted at the Site in November 2011 (BSK, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Reservoir area ranges between approximately 40 and 100 feet bgs. Alluvial deposits at the Site consist of sand that is about 15-20 feet thick. Luhrdorff and Scalmanini (1995) describe these upper alluvial sediments as Younger Alluvium. Below this, cobbles, boulders with sand, silt, and clay are common. These deposits extended to a depth of about 40 feet bgs on the eastern portion of the Site, and to about 100 feet bgs on the western portion. Luhrdorff and Scalmanini (1995) describe these lower alluvial sediments as Older Alluvium.

Geologic cross-sections for the Site have been prepared previously and included in **Attachment A** (Available Subsurface Information). The SLR geologic cross-sections depict a generalized view of the subsurface strata in the E-W and N-S directions across the Site (Attachment A). These generalized depictions are suitable for planning-level studies but are not intended for design, which will require additional subsurface explorations at the Site. The profiles shown are based on information at discrete locations and depths and actual subsurface condition variations across the site will vary. Section 5 of this report describes the subsurface stratigraphy in further detail in terms of engineering characteristics of the materials, for use in slope stability and slurry wall evaluation purposes.

The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within about a mile to the north, east, and south of Site. The surrounding hill and outcrop features suggest bedrock could get deeper to the west and southwest, towards the valley. Available borings encountered bedrock in the easterly portion of the site, at approximately 77 ft bgs. In the westerly portion of the site, bedrock was not

encountered within the explored depths of about 90 feet bgs, indicating it would be deeper than that.

Available photos of the bedrock cores indicate hard, granitic rock where it was encountered, as shown in **Figure 5**. Weathered or decomposed bedrock zones and some discontinuous intrusions of clay or clayey sand may also exist. There is an approximate 10- to 15-foot thick mantle of very dense silty, clayey sand overlying the bedrock. This layer generally follows the top of rock, likewise dipping down to the west. Both the bedrock and the overlying mantle of very dense soils are expected to be less pervious than the overlying alluvial materials and therefore provide a good opportunity to key-in a slurry wall to achieve the desired hydraulic barrier.

3.2. GROUNDWATER

Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley (SLR, 2021). Groundwater elevations in the region vary from around 460 feet amsl near the Site, to around 250 ft amsl near the City of Visalia (DWR, 2014). Groundwater is pumped extensively in the area for agricultural and urban uses.

The Site is in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (DWR, 2003). The long-term water level measurements for wells in the immediate Site area indicate relatively stable water levels, with a slight downward trend in recent years. Seasonal water level fluctuations in the Site vicinity have generally varied by less than 20 feet for the last 50 years (Fugro, 2007).

Based on available soil borings within the Site, the depth to groundwater ranges from 7 to 20 feet bgs. Further information on known groundwater levels and trends in and around the vicinity of the Site are provided in the Hydrology Report (SLR, 2021). The groundwater levels will fluctuate over time, with seasonal variations, and other factors.

3.3. FAULTS AND SEISMICITY

The Site is located in an area of relatively moderate seismicity for California. This area is centrally located between two zones of significant seismicity: the Eastern Sierra Seismic Zone, located approximately 50 miles to the east, and the San Andreas Fault Zone located approximately 80 miles to the west. There are no active or potentially active faults within 30 miles of the Site. A map of active faults in the area is provided in **Figure 6**. A list of active faults and their respective distances to the Site is provided in **Table 1**.

The nearest potentially active fault is the Independence Fault located approximately 48 miles east. This fault is part of the Owens Valley Fault Zone which is capable of producing large earthquakes, such as the Owens Valley Earthquake of 1872, which is estimated to have been a magnitude 7.4 event.

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Table 1. Active Faults in the Area

Source	Distance (km)		Deterministic Magnitude	Fault Mechanism	Dip Angle
	(km)	(miles)			
Independence	77.0	47.9	7.2	Normal	50
Birch Creek	89.6	55.7	6.6	Normal	50
Owens Valley	90.5	56.2	7.3	Strike Slip	90
Great Valley 14 (Kettleman Hills)	90.7	56.3	7.2	Reverse	22
So Sierra Nevada	96.2	59.7	7.5	Normal	50
Great Valley 13 (Coalinga)	100.6	62.5	7.1	Reverse	15
Round Valley	101.5	63.1	7.1	Normal	50
White Mountains	104.1	64.7	7.4	Strike Slip	90
San Andreas Creeping Section Gridded	106.2	66.0	6	Strike Slip	90
Hunter Mountain Connected	111.1	69.1	7.6	Strike Slip	90
Hunter Mountain-Saline Valley	111.1	69.1	7.2	Strike Slip	90
Little Lake	117.4	72.9	6.9	Strike Slip	90
Great Valley 12	117.6	73.0	6.401	Reverse	15

Note: Data obtained from EZ-FRISK, Source: USGS 2008

Earthquakes on active or potentially active faults, depending on magnitude and distance from the Site, can produce a range of ground-shaking intensities. Although there are no active faults within the immediate vicinity of the Site, distant earthquakes have historically caused strong ground-motion in the Site vicinity. The most significant example is perhaps the aforementioned Owens Valley Earthquake which occurred in March of 1872. The epicenter was approximately 56 miles east of the Site, but this earthquake is estimated to have caused strong (Mercalli Intensity, MM VI) shaking intensities in the area (Hough and Hutton, 2008).

The current state of practice to determine the seismic hazard at a given location is to perform a Probabilistic Seismic Hazard Analysis (PSHA), from which the probability of exceeding a specific ground motion parameter (typically the Peak Ground Acceleration (PGA)) within a time period is calculated. Typically evaluated sets of probability and time-period are seismic events with 10% probability of occurrence in 50 years, and those with 2% probability of occurrence in 50 years. These probabilities correspond to return periods of 475 and 2,475 years respectively. The probability of exceedance of the ground motion parameter is calculated based on the following input parameters:

- Seismic sources that can generate ground shaking at the Site;
- Characteristics of each seismic source: length, rate of ruptures, maximum magnitude, earthquake occurrence;
- The ground motion parameter versus distance attenuation relationships appropriate for each seismic source and Site conditions.

Seismic sources include active and potentially active faults (or fault zones) in the vicinity of the Site. Active faults are those that have experienced displacement within Holocene time (the past

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11,000 years) whereas potentially active faults are those that have experienced displacement within Quaternary times (approximately past 1.6 million years).

The United States Geological Survey (USGS) website provides tools that are commonly used to identify the active and potentially active faults that could generate ground shaking at sites located in the United States. These tools are also used to perform the probabilistic seismic hazard analysis to estimate the level of ground shaking a given site may experience. These tools are based on the user defined location coordinates of the site, and a user defined radius of influence selected based on the general level of seismicity of the site. A typical radius used for such evaluations is on the order of 100 km (67 miles).

The peak ground acceleration (PGA) was estimated using the USGS seismic hazard analysis calculator with the following parameters:

- Exceedance Probability of 10% in 50 years (return period of 475 years) and 2% in 50 years (return period of 2,475 years);
- Shear velocity of the deposit over the top 30 m (100 ft) of 450 m/s (1,355 ft/s) corresponding to a sandy gravelly deposit; and
- Latitude and longitude of 36.4° and -119.04° respectively.

The maximum PGAs for the Site were estimated to be 0.1 g for a return period of 475 years and 0.2 g for a return period of 2,475 years. PSHA outputs are included as **Attachment B**. It is noted that these PGA values are not equivalent to the seismic coefficient used in the pseudostatic slope stability analysis. Guidelines for Evaluating and Mitigating Seismic Hazards in California, SP-117 (California Geological Survey, 2008) states PGA should not be used as a pseudostatic coefficient, as that would result in overly conservative factor of safety (FS). The generally accepted value for pseudostatic coefficient is 0.1, with an acceptable FS of the order of 1.1.

The Site may be subjected to moderate to strong shaking based on correlations between PGA and the Modified Mercalli Intensity chart relating perceived shaking to PGA (Trifunac and Brady, 1975), provided by the USGS (**Table 2**).

Table 2. Modified Mercalli Intensity and Peak Ground Acceleration

PERCEIVED SHAKING	NOT FELT	WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
Potential Damage	None	None	None	Very light	Light	Moderate	Moderate-Heavy	Heavy	Very heavy
Peak Acc (% g)	<0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
Peak Vel (cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+

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3.4. SOILS AND EROSION

The baseline conditions at the Site is essentially flat, sloping gently downward to the south and west. The Site is undeveloped, so erosion is minimal and there are no known slope failures at the Site. Soil erosion is limited to the relatively steep slopes facing the Kaweah River at the southern portion of the Site, and select portions of the few man-made dirt roads at the Site. Other than these small areas, the Site is almost entirely covered with vegetation.

The upper 5-10 feet of the onsite soil consists of poorly-graded sand with increasing gravel at depth. Below 15 feet, the soil consists of sandy and silty gravel of increasing size and rounded cobbles to approximately 30 to 35 feet bgs. At greater depth, silty clayey sand and silty clay/low plasticity clay are predominant before bedrock is encountered (BSK, 2011).

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4. PROJECT SETTING

4.1. INTRODUCTION

The project consists of the following key components / stages of work:

- Installation of a perimeter slurry wall system to reduce water inflow and initial limited excavation until the complete slurry wall system is in service;

- Excavation of the pit that will be used for reservoir with temporary slopes, and production of aggregate;

- Placement of permanent slopes over the excavation slopes, and the construction of the Reservoir.

Each of these project phases are discussed in the following sections. The existing and proposed topography of the Site are shown in **Figure 7**.

4.2. SLURRY WALL AND INITIAL LIMITED EXCAVATION

During the initial limited excavation and material processing stage, an impermeable slurry wall will be constructed around the exaction area to limit the amount of groundwater flow into the excavation as future excavation progresses below the water table. This initial, relatively shallow excavation area is estimated to be approximately sufficient for a 6-month supply of processed material, while the slurry wall is constructed.

The slurry wall will be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. Construction would include the following facilities:

- A perimeter access road that would also serve as a leveling surface for the construction of the slurry wall. The road would vary in width from approximately 30 to 50 feet and be built on fill up to 8 foot in height.

- An approximately 60- to 90-foot-deep slurry wall surrounding the excavation/Reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow. As shown on **Figure 3**, the slurry wall would be constructed through the perimeter road and capped off with a durable gravel layer

- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate Reservoir area.

A conceptual layout of the project elements and on-site facilities applicable to this stage of work is shown in **Figure 8**. A typical section showing the Slurry Wall, slope, access road, and the infiltration trench is provided in **Figure 9**.

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After completion of the slurry wall, the following facilities would be demobilized from the site:

- Vehicle and equipment parking areas for the slurry wall operations.
- Fill material stockpiles.
- Equipment storage facilities.
- The bentonite slurry mixing pond(s) (see further discussion below on the slurry wall construction activities).
- The slurry wall backfill mixing area, which would be repositioned as the slurry wall construction progresses, to be in close proximity of the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench (**Figure 9**) through the road. Grading of the road would also provide a relatively level surface to install the slurry wall from and contain the slurry. The trench would be excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent caving of the trench. The bentonite slurry would be pre-mixed in slurry mixing pond(s) and pumped by pipeline into the excavated trench.
- The soils that are excavated from the trench would be placed in a nearby slurry wall backfill mixing area, for use in preparing the backfill. If the excavated materials are unsuitable, they would be hauled to the WCA operations area for processing, as appropriate. If additional suitable materials are needed, they would be obtained from the WCA operations or imported from off-site.
- As the trench is extended in length, backfilling would commence. The backfill mix would be prepared on-site, in the backfill mixing area(s). Backfill would typically include granular soils, mixed with bentonite, cement (if needed according to design), and water, to create a low permeability material of desired engineering properties. The mix design would be established based on various studies and tests which would be conducted during the design phase.
- Once mixed, the backfill would be pushed into the trench by a dozer or equivalent, from the narrow end of the trench at the opposite end of the trench that is being excavated. The backfill materials would form a slope inside the trench and displace the bentonite slurry. The operation would march in a similar manner, going around the perimeter of the Site. The backfill material in the trench would eventually consolidate and form a low permeability wall.

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- The length of the slurry wall is approximately 13,400 feet. Its width would be about 3 feet. It could be wider, depending on the design. If the excavation depth is more in some segments of the wall, the trench width and/or the mix design may be adjusted according to design. Generally, using a uniform width and mix design may be preferred.

- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road as shown in **Figure 9**.

- A safety berm would be constructed along the inside edge of the road, facing the excavation area.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

4.3. EXCAVATION

Excavation is expected to proceed over an estimated period of 15 to 23 years, at an average rate of approximately 920,000 gross tons per year of silts, sands, and gravels. This rate will vary in any given year.

Excavation will be done by West Coast Aggregate (WCA). WCA would also receive, stockpile, and recycle concrete construction debris materials. A conceptual depiction of the anticipated WCA operations is shown in **Figure 8** and a longitudinal cross-section of the reservoir excavation progress over time is shown in **Figure 10**.

The excavation equipment, the material processing plant, and the associated settling pond would be located within the pit footprint. Different areas of the excavation pit bottom would be lowered in stages and the process equipment would be relocated as appropriate. As the excavation of the pit is deepened, an access ramp would be constructed in the excavated slope, as shown in **Figure 11**.

The excavated materials would be processed to produce a specified range of granular construction materials for sale. This phase of the project would include the following key facilities:

- A security fence that surrounds the excavation and eventual Reservoir area.

- A controlled access gate along the west side of the excavation area.

- A scale hose near the entrance gate to provide for weighing recycle materials coming into the site and construction materials being shipped from the site.

- A haul truck unloading and loading area.

- Portable crusher and recycle plant.

- Portable diesel fuel tank for on-site refueling (4,000 gallon).

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- An aggregated production (wash/screen) plant and a crushing/ recycling plant.
- A stockpile area, or areas.
- A slurry wall
- A settling pond for clarifying/recycling process and wash water for reuse.

As shown on **Figure 7**, the excavations would occur within the footprint of the Project site. The size and depth of the excavated area would vary over time.

The excavation slope will be of the order of 1.5H: 1V (1.5 Horizontal to 1 Vertical), though other gradients and/or benched slope configurations may be developed during design, based on further geotechnical investigations, analyses, and site-specific conditions exposed during excavation. Section 5 of this report addresses the currently estimated safety factors for different scenarios.

The facilities and their layout shown on **Figures 8 or 11** are for illustrative purposes only. WCA and the design team will refine and adjust these elements as necessary, at the start of the excavation phase. All operations facilities would be kept within the excavation/ pit footprint.

During excavation phase, the area would be dewatered by using wells, trenches, or sumps according to field conditions, as described in Section 5.3.2.1. The dewatering system would drawdown the water table to near or below the excavation floor. The groundwater extraction rates would initially be minimal and increase to their maximum, as the excavation is depended to the maximum depth. The planning-level estimates of dewatering rates and other pertinent information are provided in the Hydrology Report (SLR, 2021).

The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel-filled infiltration gallery along and outside of the northern border of the slurry wall as shown on **Figures 8 and 9**.

The estimated material balance from Excavation is as shown in **Table 3**.

Table 3. Estimated Material Balance from Excavation

ITEM	ESTIMATED QUANTITY	REMARKS
Material Generated from Excavation	16.4 million tons (11,049,300 cy)	1.5H:1V Slope
Exported as product	11.5 million tons	
Use for on-site fill	2.4 million tons	3H: 1V Slope
Use for Road Construction	0.1 million tons	
Use for Slurry Wall	0.2 million tons	

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Waste and Shrinkage	2.2 million tons	

4.4. RESERVOIR

The final stage of the excavation is the earthwork required to provide suitable conditions for the construction of the Reservoir. The preparation of the pit for the reservoir is referred to as "earthwork". After the excavation phase is finished, including the earthwork for preparation of the reservoir, the reservoir itself will be constructed. These stages are described below:

- Earthwork: Backfilling of the excavation slopes to flatten them from 1.5H: 1V to 3H:1V. This is shown in **Figures 9**, **10 and 11**. The backfill would be of suitable materials that has both sufficient strength and is relatively free draining. It would be constructed from the bottom up in compacted layers of suitable thickness. The Excavation slopes will be benched, and the reservoir slope fill would be keyed into the wedge of native slope materials in front of the Slurry Wall. If needed, additional slanted chimney drain zones can be provided while the slope fill is being placed from the bottom up. **Figure 11** shows the first layer of the backfill being placed along the east side of the excavation.

- Reservoir: The construction of the Reservoir to include the channels, pumps, pipelines, power supply system, and the monitoring system. A conceptual plan of the Reservoir is shown in **Figure 12**.

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5. GEOTECHNICAL STABILITY ANALYSIS

5.1. INTRODUCTION

This section describes the geotechnical objectives in order to achieve the desired Excavation and Reservoir performance. It includes a discussion of the initial excavation and final construction of the Reservoir, the design of the excavation, slurry wall and the final Reservoir operational condition. It provides the planning level technical basis to demonstrate the feasibility of the project form a slope stability and the slurry wall cutoff points of view.

5.2. MATERIAL PROPERTIES

Available subsurface information at the site consists of six (6) borings B-1 through B-6, performed by BSK Associates in November 2011. These borings provide descriptions of the subsurface strata, which have been generalized into five strata as described below and used in the slope stability modeling.

5.2.1. MOIST SAND

In the available borings, this light colored, moist, SAND layer generally exists from the ground surface down to depths ranging from 7 to 15 feet below ground surface (bgs). It has a typical thickness of 12 feet. It is expected to have little to no cohesion and is expected to be medium-dense. The bottom of this layer is at or slightly above the groundwater levels noted in the borings.

In the slope stability analysis material layers as depicted in the output figures (slope stability profiles) provided in **Attachment C**, this layer is shown in yellow.

5.2.2. WET SAND, GRAVEL, COBBLES

This is a water-bearing layer of olive-gray colored SAND, GRAVEL, COBBLES, with an approximate thickness ranging from 15 to 25 feet. In the easterly portion of the site (Borings B-3, B-4, B-5, B-6), groundwater was noted at the top of or close to the top of this strata. In the easterly portion of the site (Borings B-1 and B-2), groundwater is noted to gradually dip to the mid-depth or slightly below the mid-depth of this layer. This stratum is also expected to have little or no cohesion, but with higher friction angles than the sandy layer above it, due to the presence of gravel and cobbles.

In the slope stability profiles, this layer is shown in gray.

5.2.3. WET CLAYEY SAND, GRAVEL, COBBLES

The top of this yellow-brown to olive-brown, wet, CLAYEY SAND, GRAVEL, COBBLE layer is generally at approximate elevation 430 feet MSL (Borings B-1 through B-5). It rises to approximate elevation 440 feet MSL near the east end of the site (Boring B-6). The thickness of this layer is of the order of 20 to 50 feet, generally increasing to the west, as the underlying

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bedrock and the dense soil mantle over the bedrock dip down to the west. This layer is expected to have both cohesion due to its clay content, and relatively high friction angle due to its sand, gravel, and cobble components.

In the slope stability profiles, this layer is shown in orange.

5.2.4. DENSE SILTY CLAYEY SAND

This layer consists of mixtures of gray, olive-gray, bluish-gray, olive-brown colored SILTY CLAYEY SAND. It is described as moist to dry, indicating that it is a 'tight' formation since it is dry despite being below groundwater. In some zones, the boring logs note hard to very hard drilling. This layer is expected to have a higher strength, with properties of a stiffer cohesive material intermixed with frictional material. This layer generally tends to follow the bedrock surface as a mantle with thickness of 20 feet or more. Towards the west end of the site, bedrock was not encountered at a depth of 90 feet. The thickness of this layer may increase towards the west.

In the slope stability profiles, this layer is shown in purple.

5.2.5. GRANITIC BEDROCK

Dry, granitic bedrock was encountered at its shallowest, at elevation 400 feet MSL or 67 feet bgs in the easterly quadrant of the site (B-4). Based on an approximate extension of the bedrock surface profile to the west, the top of bedrock can be estimated to be in the range of 340 to 360 feet MSL, or 100 to 120 feet bgs, under the westerly portions of the site. Borings B-1 and B-2 in this area did not encounter bedrock withing their maximum exploration depths of 90 feet bgs. For slope stability modeling purposes, bedrock has been assigned a very high strength and is not considered to be an influencing factor in the stability calculations.

In the slope stability profiles, this layer is shown in green.

The man-placed materials related to our analysis include the following:

5.2.6. SLURRY WALL

This is expected to be a low-permeability barrier consisting of either a soil-bentonite mix or a soil-cement-bentonite mix, depending on the design details. Two types of walls have been conceptually evaluated here: one with an approximate equivalent cohesion value of 400 psf, referred to as the 'low strength wall; and another with an approximate equivalent cohesion value of about 2,000 psf, referred to as the 'moderate strength wall'. In practice, an increase in the shear resistance values for the slurry wall would be achieved by adjusting the cement content of the slurry mix.

5.2.7. COMPACTED BACKFILL

Backfill to create the 3 to 1 reservoir slope is expected to consist of excavated on-site materials which will likely be a blend of granular and fine materials obtained from the pit. For stability

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purposes, the excavation slope would be benched and the backfill material will be placed against the slope in horizontal lifts. The backfill material would generally be compacted to 90% relative compaction. Based on experience, compacted fill consisting of a blend of granular and fine materials is assumed to have strength parameters of 200 psf cohesion and 33 degrees friction angle.

5.2.8. SUMMARY

The material parameters relevant to the slope stability analysis are listed in **Table 4**.

Laboratory test data is not available but presumed soil strength parameters can reasonably be assigned based on the available descriptions and professional judgement. The values assigned to each generalized strata as well as the future backfill and slurry wall materials are as summarized in **Table 4**. The permeability values listed in Table 4 are the same as those used in the Hydrology Study (SLR, 2021).

During design, additional geotechnical investigations and laboratory testing would be performed to confirm or modify these parameters as appropriate.

Table 4. Material Properties for Slope Stability Analysis

Material	Unit Weight γ (lbs/ft^3)	Cohesion c (psf)	Friction Angle Φ (°)	Permeability (ft/s)
SAND (SP)	115	0	35	5E-05 (1.5E-3)
SAND, GRAVEL, COBBLES (GP)	125	0	38	7E-04 (2E-2)
CLAYEY SAND, GRAVEL, COBBLES (SC/SM)	120	200	36	2E-06 (6E-5)
SILTY CLAYEY SAND (SC/CL)	120	400	28	5E-08 (1.5E-6)
GRANITIC BEDROCK	135	"INFINITE" STRENGTH		3E-06 (9E-5)
SLURRY WALL	130	varies	0	3E-11 9E-10
COMPACTED BACKFILL	120	200	33	2E-06 (6E-5)

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5.3. SLOPE STABILITY ANALYSIS

5.3.1. LIMIT EQUILIBRIUM METHOD

Slope stability analysis has been performed using the Slide2 geotechnical software by RocScience. Slide2 is a two-dimensional limit equilibrium slope stability analysis program for estimating the slope Factor of Safety (FS) by various methods of slices. Circular surfaces were used in the analyses to identify the critical failure surface having the lowest FS for each assumed scenario.

5.3.2. EXCAVATION SLOPE STABILITY

This portion of the evaluation pertains only to the Excavation conditions until permanent reservoir slopes are constructed at a shallower gradient. Throughout the duration of excavation, dewatering systems will be in place to allow safe operation inside the pit. This requires a dewatering system capable of maintaining the groundwater water levels at or below the lowest excavation level in the pit, as excavation progresses. This would be accomplished by the combination of the perimeter slurry wall outside and interior dewatering systems inside the pit. The critical slope condition would be at the maximum excavation depth.

The desired excavation slopes would generally be targeted to achieve the steepest safe gradient. For most applications, this would be in the range of 1.5H: 1V to 1H: 1V. Depending on site-specific conditions and the localized variations in the exposed conditions, various measures are then implemented as excavation proceeds. Some of these measures may include varying the slope gradients, using benches, providing additional drainage and dewatering systems, and if needed, installing additional structural support systems.

Our analysis aimed to evaluate the feasibility of the project based on the soil parameters summarized in Section 5.2.8, without relying on additional stabilizing measures such as benches. Further evaluation and verification of these parameters will be undertaken during design and additional safeguards would be implemented during construction to address the specific conditions.

A generally acceptable FS value for temporary excavation slopes is of the order of 1.25. For relatively longer temporary excavation durations involved here, an additional margin may be desirable, though not mandated.

5.3.2.1. Dewatering Scenarios

For the fully excavated condition, the groundwater levels between the toe of the excavation slopes and front of the slurry wall system would depend on the type and location of the dewatering systems to be used, as well as the slurry wall properties, the permeability of the materials beneath the slurry wall, and the base of the excavation. The assumed permeability values based on generalized subsurface material types are as provided in Table 4. The slurry wall configuration is

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as shown in the various slope stability outputs. During design and construction, further details and verification would take place.

For our evaluation, the dewatering system effectiveness between the toe of slope and the slurry wall has been assumed in three categories. In all cases, the dewatering would have to bring the groundwater levels to no higher than the toe of slope. For groundwater levels projected under the slope, three different conditions have been presumed. These are shown in the output figures of Attachment C, as part of the different slope stability analysis scenarios. From a typical construction practice point of view, these three dewatering levels may consist of the following methods:

- **Dewatering by Wells:** Groundwater assumed at or below the bottom of the excavation level between the toe of slope and the front of the slurry wall;
- **Dewatering by Continuous Trenches at the Base and Perimeter of the Excavation:** Groundwater assumed to rise from the toe of slope to + 10 feet at the front face of the slurry wall;
- **Dewatering by Intermittent Sumps:** Groundwater assumed to rise from the toe of slope to + 20 feet at the front face of the slurry wall.

The nomenclature used here for differing categories of dewatering aggressiveness is only intended as a descriptive tool, it does not to imply the application of a specific dewatering system. The suitability and the details of any dewatering system would be developed during design and construction.

5.3.2.2. Slope Gradient Scenarios

For each of these three dewatering categories, three different slope gradients have been evaluated, for a total of nine (9) scenarios. The results of these scenarios are briefly described below and summarized in **Table 5.**

- **1.5H: 1V Slope:** The estimated FS for an excavation slope of 1.5H: 1V is satisfactory for each of the dewatering scenarios considered. The FS values range from 1.4 (with trench or sump dewatering) to 1.5 (with well dewatering). A 1H: 1V slope gradient provides an additional margin above the minimum 1.25 FS value for each of the scenarios analyzed.
- **1.25H: 1V Slope:** The estimated FS for an excavation slope of 1.25H: 1V is adequate with trench or sump dewatering. An added margin can be achieved if a more aggressive dewatering well system is used. It may be possible to achieve higher FS values with this slope with other dewatering methods, depending on the results of further explorations, additional field and laboratory tests, and refinements that can be made during design and construction.
- **1H: 1V Slope:** The estimated FS values for an excavation slope of 1H: 1V range from 1.1 (with sump dewatering) to 1.2 (with trench or well dewatering). These findings may vary depending on the results of further studies. Unless additional studies indicate otherwise, a 1H: 1V excavation gradient is not considered to be suitable under the current assumptions.

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5.3.2.3. Summary oof Excavation Slope Stability Scenarios

The estimated Factor of Safety (FS) for different excavation slope scenarios is summarized in Table 5.

Table 5. Estimated Factor of Safety for Different Excavation Scenarios

Excavation Slope Gradient	Condition Analyzed		
	Excavation dewatered from toe of slope to slurry wall	Excavation dewatered from toe of slope to +10 feet at slurry wall	Excavation dewatered from toe of slope to +20 feet at slurry wall
1.5H: 1V (33°)	1.5	1.4	1.4
1.25H: 1V (39°)	1.4	1.3	1.3
1H: 1V (45°)	1.2	1.2	1.1

5.3.3. RESERVOIR SLOPE STABILITY

Upon completion of excavation, the cut slopes will be backfilled to a permanent gradient of 3H: 1V to use the facility as a reservoir. The reservoir will be subject to various cycles of filling and emptying. The results of the slope stability analysis for this long-term use condition are summarized in **Table 6.**

The analysis for reservoir slopes have included steady state, rapid drawdown, and seismic (pseudostatic) conditions. A commonly used dynamic slope stability analysis method is pseudostatic analysis. This method applies a simulated equivalent acceleration acting on the mass of a potential slide mass, using limit equilibrium analysis methods. The ground motion parameter used in a Pseudostatic analysis is referred to as the seismic coefficient “k”, which is different than the peak ground acceleration values.

Steady State:

Steady state seepage conditions were incorporated in the model using the groundwater boundary conditions for the final configuration, using the estimated hydraulic conductivities of subsurface layers and the properties of the slurry wall cutoff system.

Rapid Drawdown:

The rapid drawdown conditions are applicable when the reservoir is emptied. Emptying the reservoirs is expected to occur over approximately 2 weeks which would allow some of the water pressure in the slope to dissipate. However, the analyses performed conservatively assumed no pressure dissipation, which is an extreme worst-case condition.

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Pseudostatic:

Seismic slope stability has been evaluated by considering an equivalent horizontal ground acceleration corresponding to a pseudostatic seismic coefficient of 0.1.

Table 6. Estimated Factor of Safety for Different Reservoir Conditions

3H:1V Backfill Placed Over	Condition Analyzed		
	Steady State	Rapid Drawdown	Pseudostatic
1.5H: 1V (33°)	1.6	1.3	1.1
1.25H: 1V (39°)	1.6	1.3	1.1
1H: 1V (45°)	1.5	1.3	1.1

The slope stability FS values for each of the permanent condition scenarios are all within their respective acceptable FS values. The rapid drawdown FS value reflects a conservative assumption and actual conditions would likely be higher. There is no significant difference in FS values for a 3H: 1V slope placed on different excavation slope gradients. This is as expected since the overall stability of the permanent slope is largely governed by the wedge of compacted fill placed over the temporary excavation slopes.

5.4. SLURRY WALL STABILITY ANALYSIS

5.4.1. FINITE ELEMENT METHOD

The analysis method aimed to assess the displacements which would develop in the slurry wall as the strength and stiffness parameters of the wall were varied over an expected range that can be achieved. Analysis was carried out using the finite element modelling software RS2, developed by Rocscience. RS2 is a 2D finite element program for soil and rock applications, with the ability to carry out slope stability analysis using the shear strength reduction method.

The developed slope model was meshed using a graded mesh with 6-noded triangles. The boundaries were fixed both in the x and y plane. Groundwater was set at a total head condition of 5 feet bgs. The typical model configuration and output graphics are provided in **Attachment D**.

The limit equilibrium method such as that used in Section 5.3, evaluates the different failure conditions of the slope system, but does not provide information on ground movements within the system. On the other hand, the fine element model evaluates the ground deformations within the system.

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The FS value in limit equilibrium is based on the ratio of resisting forces in relation to the sliding forces. In the finite element method, an equivalent FS is obtained by reducing the soil strength until the deformations become excessive and the computation becomes unstable (failure). The ratio of actual soil strength in relation to the reduced strength for failure is called the Strength Reduction Factor (FRS). The FRS and FS values for a given slope would be similar, but not necessarily identical.

5.4.2. MATERIAL PROPERTIES

The basic soil strength parameters are as established in Section 5.2.8 (Table 4). These values were supplemented with elastic properties corresponding to each layer. The expanded soil material properties are as summarized in **Table 7** below.

Table 7. Additional Soil Properties for Finite Element Model (FEM)

GEOTECHNICAL DOMAIN	UNIT WEIGHT (LBS/FT3)	COHESION (PSF)	FRICTION ANGLE (DEGREES)	ELASTIC MODULUS (PSI)	POISSON'S RATIO	HYDRAULIC CONDUCTIVITY FT/SEC (CM/SEC)
SP	115	0	35	3625	0.3	5.25E-5 (1.60E-3)
GP	125	0	38	10877	0.3	7.38E-5 (2.25E-3)
SC/SM	120	200	36	5076	0.3	3.28E-8 (1E-6)
SC/CL	120	400	28	2175	0.25	3.28E-9 (1E-7)
Bedrock	135	Infinite Strength				-

The slurry wall parameters were varied to explore the deformation pattern variations for progressively stronger slurry wall compositions. **Table 8** summarizes the two different slurry wall strength and elastic properties used in the model.

Table 8. Slurry Wall Material Properties for FEM

SLURRY WALL	UNIT WEIGHT (LBS/FT3)	EQUIVALENT COHESION (PSF)	FRICTION ANGLE (DEGREES)	ELASTIC MODULUS (KSI)	POISSON'S RATIO	HYDRAULIC CONDUCTIVITY FT/SEC (CM/SEC)
Low Strength	130	400	0	1.4	0.3	3.28E-10 (1E-8)
Moderate Strength		2000		6.5		

The low strength value (400 psf cohesion) is intended to approximate a typical soil-bentonite mix. Soil-bentonite mix is commonly used in balanced pressure or modest differential-pressure situations. For detailed design purposes, the engineering properties of different slurry wall mix

designs using on-site materials will be established based on specific sampling and testing to be done.

In the case of uneven earth and substantial hydrostatic pressure differentials across a slurry wall, a more robust system may be needed, depending on several factors that will be considered during design. The moderate strength value of approximately 2 ksf cohesion, is intended to represent a soil-cement-bentonite system which is a more robust slurry wall.

5.4.3. SLURRY WALL STABILITY FOR EXCAVATION

In the FEM scenarios studied, the slurry wall and the slope have the same layout as in Section 5.3. The analyses were conducted for a 3-foot-wide slurry wall, located behind the top of the excavated slope. A slope of 1.5H:1V was applied to all Excavation scenarios since this is the most realistic case. The total excavation depth for all scenarios is 76 feet bgs.

The excavation progress in front of the slurry wall was modeled for the interim stages of excavation. The models were staged to simulate the excavation in approximate depth increments of 3.8 feet, representing a typical annual production rate, to reach the total excavation depth of 76 feet in 20 years.

Outputs from the RS2 finite element model for the various scenarios discussed here are provided in Attachment D.

For each scenario, the deflections of the slurry wall were estimated as provided in **Figures 13 and 14**. The strength reduction method was applied to obtain the critical SRF (FS) for each slurry wall strength scenario at the full excavation stage. A summary of the results for the four scenarios are provided in **Table 9.**

Table 9. Summary of FEM Results for Different Slurry Wall Scenarios

SCENARIO	ESTIMATED MAX. DISPLACEMENT (INCHES)	ESTIMATED ANNUAL DISPLACEMENT (INCHES)	SRF (FS)
Low Strength Slurry Wall (400 psf)	5.2	0.3	1.20
Moderate Strength Slurry Wall (2 ksf)	3.8	0.2	1.26

5.4.4. SLURRY WALL STABILITY FOR RESERVOIR

A finite element model analysis was performed for the case of the slurry wall behind the permanent 3H:1V slope of the Reservoir. The input for our analysis is based on the geotechnical characteristics of the materials in the excavation area, that are assessed from available boring logs.

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For the conditions analyzed, the slurry wall extends from the ground surface behind the top of the outer slope, down to approximately 10 feet below the bottom of the Reservoir, into the low permeability native materials.

For the completed Reservoir with 3H:1V slopes and empty condition, which is more critical for slope stability, the calculated FS exceeds the generally accepted value of 1.5.

For rapid drawdown conditions which represents emptying of the reservoir without allowing adequate time for dissipation of water from the soil within the slope, the FS exceeds the generally accepted values which range from 1.25 to 1.40.

For pseudostatic (seismic) conditions, the FS exceeds the generally accepted value of 1.1.

Results show that the proposed slopes are sufficiently stable, including during earthquake conditions. The slope and slurry wall deformation analyses that demonstrate that the slopes and slurry wall deformations would be tolerable with adequate safety.

Further analysis during design will establish a suitable slurry wall mix design to provide the desired performance of the system.

The key design aspects of the slurry wall are the mix designs for both the bentonite slurry that is used to support the trench during excavation and for the backfill soil-bentonite mixture that forms the slurry wall. The details of these mixes would be established during the detailed design process discussed below and would incorporate the following essential design bases and criteria.

- The bentonite slurry mix, which is predominantly a bentonite-water mixture is designed to have sufficient viscosity and density to support the trench walls during excavation.
- The soil-bentonite backfill mix is designed to have a low permeability, be sufficiently ductile to adjust to deformations in the excavation slopes, and to resist the hydraulic pressures that will develop behind the wall as the Excavation is dewatered or the Reservoir is emptied.
- A key parameter in the design is to ensure the grain size of the soil materials are sufficiently large so that the water pressure cannot force them to migrate through the adjacent natural soils to prevent what is known as “piping”. Use of a soil-cement-bentonite mix could further improve the resistance to piping.

These types of walls are frequently constructed and therefore there is a sound basis for assessing appropriate mix designs that will meet the above requirements.

5.5. DESIGN AND CONSTRUCTION CONSIDERATIONS

5.5.1. SUBSURFACE INFORMATION

During design, additional boings will be performed to obtain relevant design information. Groundwater and in-situ permeability of the subsurface strata as well as the likely performance of slurry wall mix materials will also be evaluated in the design phase of the project. The slurry wall embedment depth and having an adequate cutoff depth while avoiding excess penetration into

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bedrock, will be based on the soil profile variations along the slurry wall alignment. Subsurface investigations, field tests, laboratory tests, and detailed engineering evaluations will be conducted during design.

5.5.2. SLOPES

5.5.2.1. Excavation Slopes

During excavation, the slope gradients and the types and locations of dewatering elements will be adjusted by the Contractor, in consultation with professionals specialized in this type of work. There are many possible variations which would be implemented during construction. Some of these include adjusting the temporary slope gradients and the layout of benches, and the installation of temporary slope stabilization measures.

5.5.2.2. Reservoir Slopes

The permanent 3H:1V slopes will be placed over the temporary excavation slope face. This will involve benching into the Excavation slope and placement of an engineered fill buttress on the slope, in compacted lifts. Appropriate provisions for drainage and scour prevention will be made during design of the permanent Reservoir slopes.

5.5.3. SLURRY WALL

5.5.3.1. Variations in Design:

The evaluations presented in this document demonstrate that the proposed project concept is feasible. There are several variables that can be adjusted during design to achieve the desired performance. For example, a lower strength slurry wall with a greater width can achieve similar results as a higher strength wall with a narrower width. Also, the design parameters can be adjusted for different segments of the wall if the excavation depths or other demands (subsurface condition variations) require such adjustments.

5.5.3.2. Slurry Wall Materials:

The performance of the slurry wall mix materials will be further evaluated during design. The use of Soil-Bentonite (S-B) versus Soil-Cement-Bentonite (S-C-B) will be determined. While S-B wall is less expensive, it is prone to higher levels of differential settlements as well as higher lateral and cyclic deflections under uneven loading patterns. Design will evaluate the wall materials to achieve the desired long-term performance.

The percentage of fines available in the excavated soils will vary with depth and along the wall alignment. Bentonite addition, and if needed, importing borrow soils will help achieve the required hydraulic conductivity of the backfill mix.

A geotechnical investigation program may include evaluation of likely borrow source areas in the project area. A geotechnical laboratory testing program will provide information on the mix design

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and its hydraulic conductivity, consolidation, and strength characteristics. Typically, different mix designs would be prepared and tested to meet the desired characteristics. Also, the mix design would attempt to maximize the use of on-site soils.

5.5.3.3. Slurry Trench Stability:

The open excavation trench would be stabilized by using a bentonite slurry. Design and construction will need to address trench stability through the water-bearing gravelly zones in the upper alluvium. In such conditions, the mix design may need to be adjusted and/or other protective measures, such as trench shields, may be needed. When appropriately designed and constructed, gravel intermixed with other finer materials can help reduce the amount of consolidation settlement of the slurry wall.

The bentonite-water slurry material will provide trench stability and caking on the sidewalls. The slurry material properties (viscosity, density, filtration, pH) will be checked during construction at the mixing point and in the trench with a submerged sampler to facilitate sampling from different depths.

5.5.3.4. Construction Quality Control:

A comprehensive construction quality control and testing program would verify that the parameters intended during design are achieved during construction. Items to be checked during construction may include:

- Various properties of the slurry and backfill materials;
- Adjustments to those properties based on conditions encountered;
- Checking, sampling and testing of the advancing backfill slope (gradient, slump, density, fines content, hydraulic conductivity);
- Checking the cleanliness of the trench bottom;
- Noting the amount of consolidation of the slurry backfill materials;
- Performing other observations, tests, collecting monitoring data, and timely use of such information to make adjustments as the work progresses.

Remedial measures (such as topping off consolidated zones) would be implemented based on the monitoring data collected, and other observations.

After construction is completed, event-based monitoring could include inspections and monitoring data evaluations after significant seismic and storm events.

5.5.3.5. Resiliency Considerations:

During Excavation, the slurry wall will be subject to considerable differential hydraulic gradients between the back and the front of the slurry wall. There will be some differential earth pressures due to level ground on one side and slope on the other. There may also be moisture condition variations due to changes in groundwater conditions, seasonal and climatic variations, dewatering patterns, and non-uniform layering with different water retention properties of soils. Such factors can introduce wetting-drying cycles and/or loading-unloading cycles. Under such conditions, it is normal for fissures to develop in the slurry wall. However these are not anticipated to affect the

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performance of the Slurry Wall, as it will still be capable of minimizing inflow in conjunction with appropriate dewatering elements.

During permanent use, the permanent slope will provide a substantial buttressing benefit. During permanent use, multiple cycles of filling and emptying of the reservoir as well as the seasonal and climatic factors may introduce some wetting and drying of the slurry wall, but this will be of a much-reduced nature due to the added soil cover in front of the slurry wall. Also, the load-unload cycles will have a much less significant influence on the slurry wall due to the buttressing effect of the fill. The deflection patterns felt at the slurry wall will diminish during permanent use, which is also evidenced by the Finite Element Modelling results.

5.5.3.6. Monitoring and Verification of Wall Performance:

A monitoring program will need to be implemented to check the performance of the completed wall. Monitoring would include groundwater levels at different locations on either side of the slurry wall, as well as the settlement of the slurry wall. Additional monitoring details related to the slurry wall performance would be developed as recommended by the designer.

5.6. CONCLUSION

The project is feasible from a geotechnical point of view. Additional studies will provide the necessary information needed as the project progresses into its design and construction phases.

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6. EVALUATION OF POTENTIAL IMPACTS

6.1. CEQA SIGNIFICANCE CRITERIA

Geology and Soils impacts are described in subsequent sections based on an evaluation of geotechnical, geological, and conditions, and consideration of potential changes to ground conditions due to the Project. A geology and soils impact is considered significant if it would result in any of the following, adapted from the CEQA Guidelines:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known active fault trace;

   ii. Strong seismic ground shaking;

   iii. Seismic-related ground failure, including liquefaction;

   iv. Landslides.

b) Result in substantial soil erosion or loss of topsoil.

c) Located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

6.2. IMPACT GS 1 (CRITERION "A"): SEISMIC HAZARDS

The majority of Tulare County is free of the faults noted on the Alquist-Priolo Earthquake Fault Zoning Map. Such faulting is noted only along the eastern-most boundary with Inyo County. As such, there is no known active earthquake fault in or within 30 miles of the Project site. Risks associated with different manifestations of seismic hazards are addressed below.

6.2.1. Fault Rupture (Criterion "A.i")

Earthquake surface rupture is the physical displacement of surface deposits, either laterally or vertically, along a fault trace. Surface rupture is the surface expression of the subsurface fault movement and generally only occurs along or within a few hundred feet of the fault trace that moves during an earthquake. Not all large earthquakes have a surface expression or co-seismic surface rupture (e.g. blind thrust faulting associated with the 1994 Northridge, M_W6.7 earthquake).

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The proposed Project is in Tulare County which is not a designated Alquist-Priolo Earthquake Zone (APEZ) as issued in Special Publication 42 by the California Geological Survey (2007). Geographic areas are designed as APEZ if they encompass potentially active or active faults.

A review of the 2014 fault activity map for California shown on **Figure 6** and tabulated on Table 1 indicates that no active faults cross the Site. The closest faults to the Site are the Independence Fault, the Owens Valley Fault Zone, and the San Andreas Fault Zone at least 35 miles from the Site. Because the Site is not located within or near and APEZ, the potential for surface fault rupture at the Site is considered to be insignificant.

6.2.2. Ground Shaking (Criterion "A.ii")

Ground Shaking Intensity:

The estimated ground shaking (acceleration) at the Site does not pose a potentially significant impact because Project's proposed design accounts for the estimated ground acceleration and therefore ground shaking is expected to pose a less than significant impact. The proposed slopes into the quarry are at an inclination of 3:1 (Horizontal to Vertical) corresponding to an angle of 18.5 degrees. The materials at the site range from silty sand to sandy gravel with shear resistance characterized by friction angles which, for that type of material, ranges from 30 to 38 degrees. Stability analyses were carried out for these conditions and the applicable pseudostatic coefficient. The calculated FS values as discussed in Section 5, meet the necessary stability criteria.

Ground Shaking Induced Seiche:

Seismic events can create hazards with their impact on water bodies. One such phenomenon is Tsunami, which would not apply here since the Site is not near the coast. A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes as a result of ground shaking. The wave can reduce water levels at one end of the water body and increase the water level on the other, similar to the "sloshing" of water back and forth.

The risk of seiche developing in the proposed reservoir as a result of ground shaking during an earthquake has been evaluated and the results indicate this to be unlikely.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave.

The natural period of the reservoir can be calculated using the Merian formula assuming a rectangular basin (USNRC, 2011).

$$\mathrm{T} = \frac{2\,L}{\sqrt{gh}}$$

Where L is the length of the basin, g the acceleration of gravity (32.2 cm/sec^2), and h the depth of water. Combining a representative value of 600 ft as the average width of the basin and a depth of water h of 70 ft, the natural period of the reservoir is estimated to be:

$$T = \frac{(2)(600)}{\sqrt{(32.2)(70)}} = 25\ s$$

This natural period is to be compared to that of the earthquake that may shake the site. The typical range of period for strong ground motion is between 0 and 5.0 seconds, with the dominant period for the site-specific event being on the order of 0.2 second (USGS, http://geohazards.usgs.gov/hazardtool/application.php). Therefore, the difference in period between the reservoir and the design earthquake is two orders of magnitude.

An empirical formula is provided in HAZUS (FEMA, 2003) to estimate the peak wave height of the seiche as:

$$H = \sqrt{\frac{A}{L\,(\pi f)^2}}$$

Where H is peak height, A the acceleration in, g's, f the frequency of the lake, and L the wavelength (5.12/ft^2). Using the PGA calculated for the 2,475 year event of 0.20 g, the maximum wave height a seiche is estimated to be 0.06 cm.

The estimated value of the peak wave for the seiche at the site is extremely low and for practical purposes, insignificant. In addition, the ratio between the reservoir and the natural period of the seismic event that could occur on site indicates that a possible resonance condition is unlikely.

6.2.3. Ground Failure, Liquefaction, Lateral Spreading (Criterion "A.iii")

Soil liquefaction is a condition in which saturated granular soils undergo a substantial loss of strength and deformation due to increased pore pressure resulting from cyclic stress application induced by earthquakes. During liquefaction, the soil becomes sufficiently mobile to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are sand deposits that are saturated, loose, clean, uniformly-graded, and fine-grained. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo differential settlement. This will result in reduction of foundation stiffness and capacity. When this occurs, the structure can settle, tip, or even become buoyant and shift upwards. Liquefaction and associated failures could damage foundations, roads, underground cables and pipelines, and disrupt utility service.

Earthquake induced liquefaction typically occurs within the top 50 ft of liquefaction-prone soil, if those soils are saturated. A review of the logs associated with borings advanced at the Site (BSK, 2011) indicates that the water table is at an average depth of 15 ft below grade (Attachment A). The saturated soils below that depth are classified as silty sand to poorly-graded sandy silt and cobbles. While some of the layers are susceptible to liquefaction, the required dewatering will lower the groundwater levels and reduce the risk of liquefaction.

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of compaction and settling of loose subsurface materials Given the geologic setting of the Site and generally competent materials, seismically-induced settlement is not considered to be a significant hazard.

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Seismically induced lateral spreading involves lateral movement of earth materials laying over potentially liquefiable layers. Lateral spreading is characterized by near-vertical cracks with predominantly horizontal movement of the soil mass. Because the potential for liquefaction at the Site is generally considered to be low and groundwater suppression has to be in effect, the potential for lateral spreading is considered to be low. Pseudostatic slope stability analysis indicates adequate slope stability FS.

6.2.4. Seismically Induced Landslides (Criterion "A.iv")

Slope stability under Site baseline conditions does not present a significant hazard. There are currently no significant slopes or other topographic features at the Site that appear susceptible to slope failure. The California Geologic Survey has produced a series of landslide inventory and landslide hazard maps for unstable areas of the State. The Site and the vicinity are not mapped as having pre-existing or future slope stability hazards.

Static and seismic stability of slopes to be created for the Project are addressed in Section 5 and Attachments C and D of this report.

6.3. IMPACT GS 2 (CRITERION "B"): SOIL EROSION OR LOSS OF TOPSOIL

Erosion is the removal of soils and rocks due to natural process such as flow of water and wind. Erosion is expected to occur within the Project site as a result of excavation, but not at the ground surface (i.e., outside the Project perimeter); therefore, ground erosion is considered to be a less than significant impact.

Vegetation and topsoil will be removed during the initial site preparation and excavation the Project site. Topsoil removed will be stockpiled for use in reclamation/revegetation of the Project site, and/or the adjacent CEMEX Lemon Cove Facility site in accordance with the SMARA-approved Reclamation Plan. The reservoir slopes would be designed to include appropriate scour prevention measures.

6.4. IMPACT GS 2 (CRITERION "C"): GROUND INSTABILITY

This CEQA criterion seeks to answer if the Site is located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. The seismically induced risk of ground instability (liquefaction, lateral spreading) has been addressed in Section 5. Ground instability related to project activities are addressed in this Section. The project is considered feasible and capable of containing such risks by applying proper design and construction practices. Evaluation of different ground instability factors are addressed below.

Stability of Existing Ground Conditions:

There are no known existing geologic conditions or natural slopes that would impact the stability of existing ground conditions.

Stability of Project Slopes:

The Project involves excavation of a reservoir. The anticipated depth of the reservoir is approximately 75 ft with slopes out at 3:1 (Horizontal to Vertical).

A slurry wall will be installed around the perimeter of the pit. The subsoil conditions at the Site were established based on existing onsite soil boring logs and the grain size analyses performed on samples recovered during the drilling operations (BSK, 2011). The subsoil conditions generally consist of sand, sandy gravel, and clayey sand with cobbles. For the purpose of our slope stability evaluation, a representative cross-section was developed and slope stability analyses were performed as discussed in Section 5 of the report. Supporting analysis details are provided in Attachments C and D.

Based on our analysis, the project slopes have adequate FS values.

6.5. IMPACT GS 2 (CRITERION "D"): EXPANSIVE SOILS

The soils in the area are predominately classified as granular materials such as sand, gravel and cobbles, with some silt and occasional clay lenses. None of those soils are subject to expansion when wetted. Therefore, there is no risk to life or property from expansive soils and this hazard is considered less than significant.

6.6. IMPACT GS 2 (CRITERION "E"): SUPPORT OF WASTEWATER SYSTEMS

There are no permanent habitable facilities involved in this Project. Hence, this item is not applicable (N/A).

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7. CONCLUSION

As described in previous sections, SLR has conducted a review of baseline and Project related conditions and has evaluated potential Project related impacts relating to Geology and Soils based on CEQA Appendix G criteria. Based on our evaluation, the project is feasible from a geologic and geotechnical engineering point of view. We have identified no significant impacts.

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8. REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2008. Alaska Administrative Code (18 AAC 75), Oil and Other Hazardous Substances Pollution Control, as amended through October 9.

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

FEMA, 2009, Flood Insurance Study, Tulare County and Incorporated Areas.

FERC, 2012 "Notice of Preliminary Permit Application file by Kaweah River Power Authority, Federal Energy Regulatory Commission Document 2012-21178, Filed August 27, 2012.

Fugro, 2007, Water Resources Investigation of the Kaweah Delta Conservation District.

GEI/GSI, 2020, Kaweah Subbasin – Basin Setting Components, GEI Consultants and GSI Water Solutions, January 10, 2020.

GKGSA, 2020, Groundwater Sustainability Plan, Greater Kaweah Groundwater Sustainability Agency, January 22, 2020.

Irrigation Training and Research Center, undated, http://www.itrc.org/databases/cecaplrp/CEC%20APLRP%20Case%20Study%20TID.pdf. retrieved August 22, 2014.

Luhdorff and Scalmanini, 1995, Impact Analysis, Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California.

Luhdorff and Scalmanini, 2004, Assessment of Hydrology and Water Quality, Kaweah South Mining Project.

Schmidt, 2012, *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project.*

SLR, 2021, McKay Point Reservoir Project – Geology and Soils Technical Study, 2021.

Tulare Irrigation District, 2011, Groundwater Elevation Monitoring, December 2011.

US Army Corps of Engineers, 1990, Kaweah River Basin, California.

US Army Corps of Engineers, 2005, Water Control Manual, Terminus Dam and Lake Kaweah, Drought Contingency Plan for Terminus Dam and Lake Kaweah.

Kaweah and St. Johns Rivers Association (Watermaster), 1933-2020, Annual Reports.

Western Regional Climate Center, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4890, downloaded September 19, 2014.

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LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

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The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given Site area. Subsurface conditions that are not apparent may exist at the Site. Our professional opinions are based in part on interpretation of existing data by others from a limited number of discrete sampling locations. Actual subsurface conditions may vary.

Further explorations are needed for design and construction. The specific future design demands, passage of time, manifestation of latent conditions, or occurrence of future events may change the findings, observations, and conclusions in this work product.

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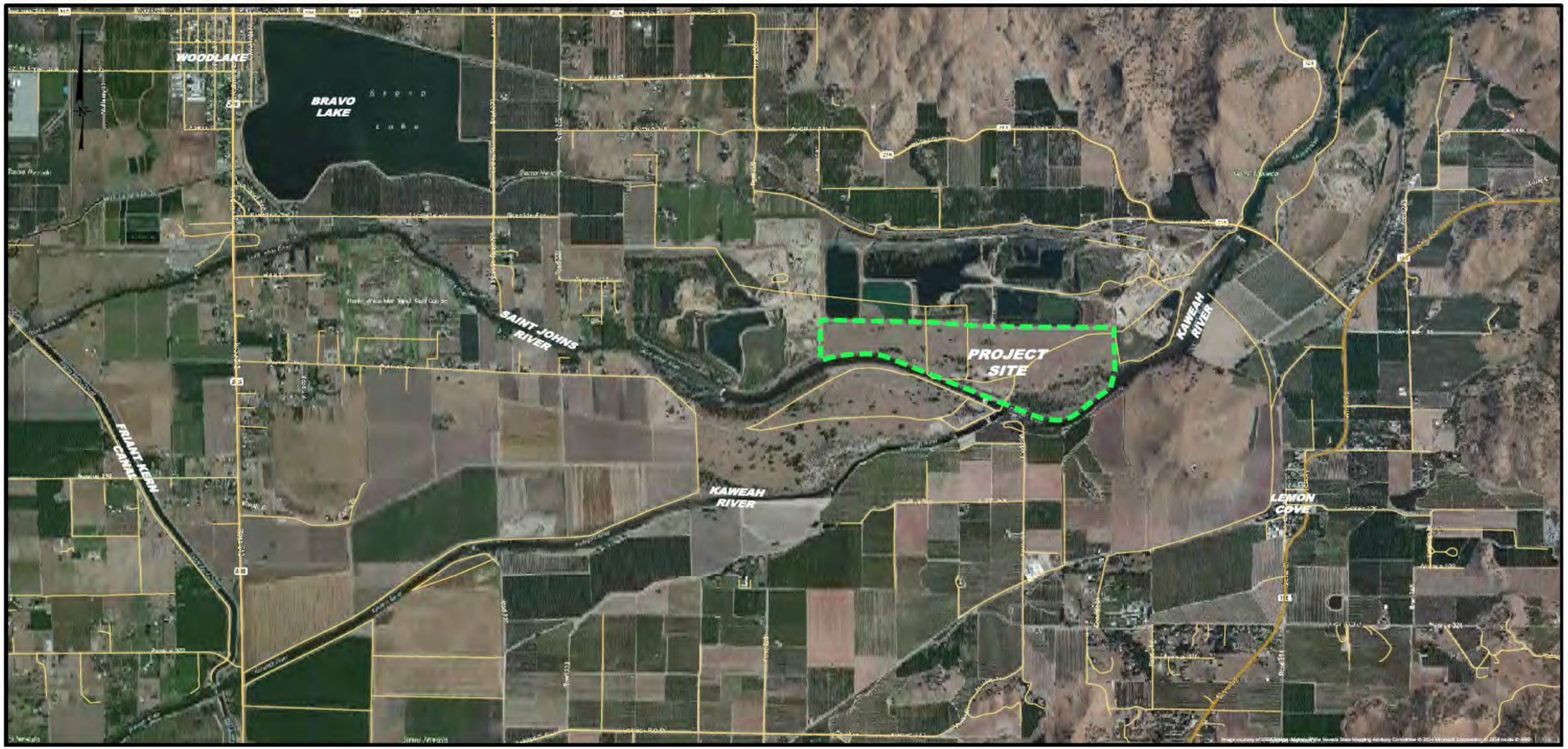
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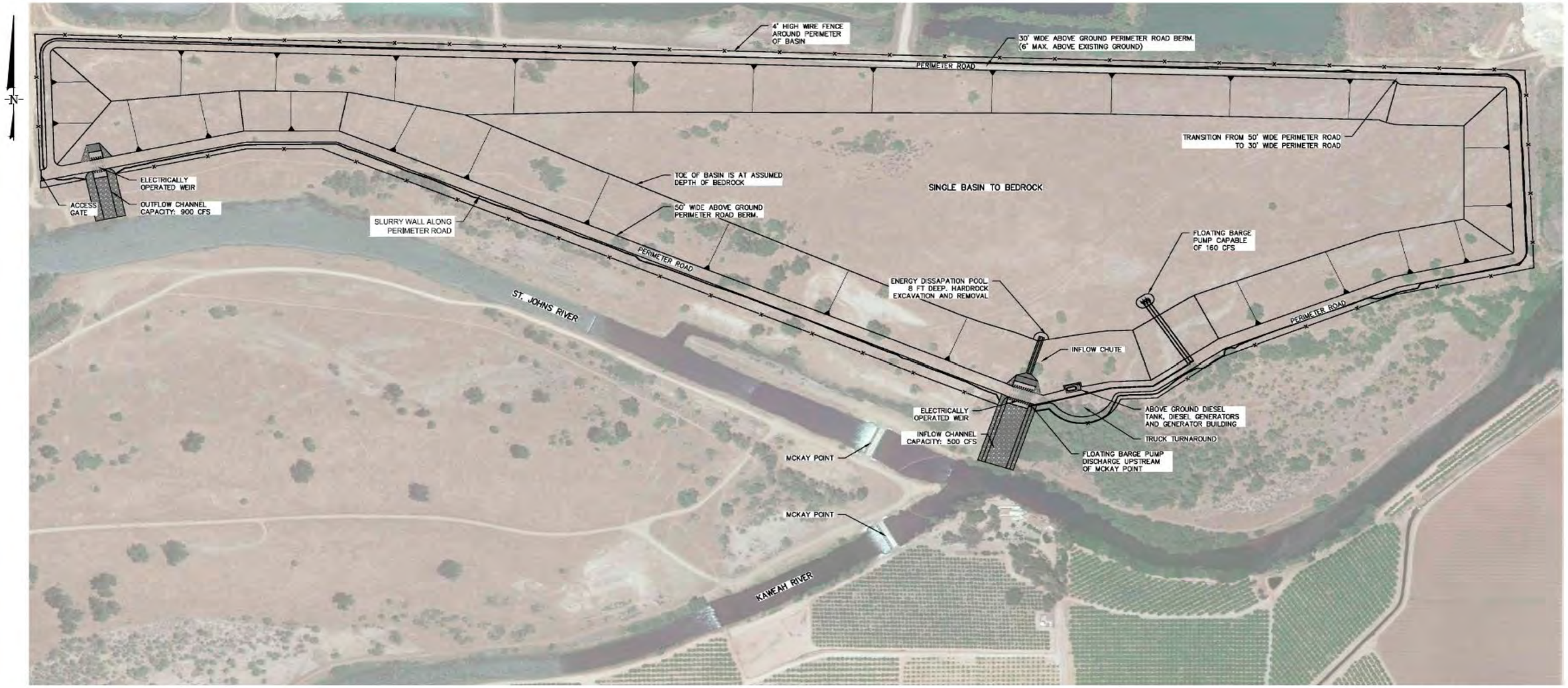
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021	
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **SITE LOCATION MAP**	FIGURE No. **1**	REV

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PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00002	
	TITLE: **SITE VICINITY MAP**	FIGURE No.: **2**	REV:

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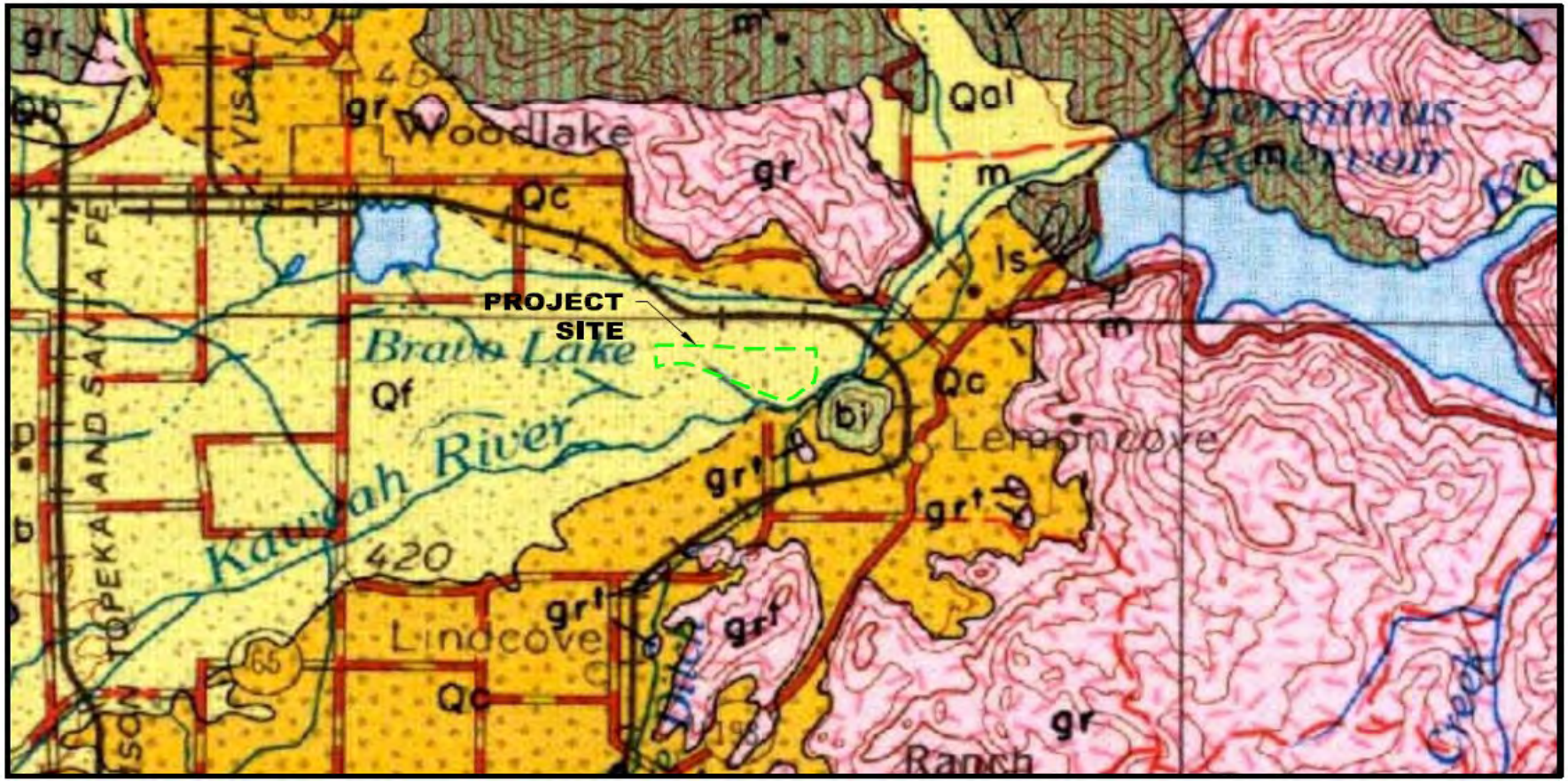


SOURCE: PROVOST & PRITCHARD, 2/18/14
FIGURE 1 - PROPOSED SITE MAP

NOT TO SCALE

REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021	
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **CONCEPTUAL PLAN**	FIGURE No. **3**	REV

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LEGEND:

- Qal - ALLUVIUM
- Qt - FAN DEPOSITS
- Qc - PLEISTOCENE NONMARINE
- gr - MESOZOIC GRANITIC ROCKS
- ub - MESOZOIC ULTRAMAFIC INTRUSIVE ROCKS
- m(ls) - PRE-CRETACEOUS METAMORPHIC ROCKS (ls = LIMESTONE OR DOLOMITE)
- ms - PRE-CRETACEOUS METASEDIMENTARY ROCKS
- mv - PRE-CRETACEOUS METAVOLCANIC ROCKS

SOURCE: GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET, CALIFORNIA GEOLOGICAL SURVEY, 1:250,000 SCALE

0 6000 FT

REPORT: **GEOLOGY AND SOILS**	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: DECEMBER 2021
PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00002
	TITLE: **GEOLOGIC MAP**	FIGURE No.: **4** / REV:

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B-3 (86 - 90 ft)



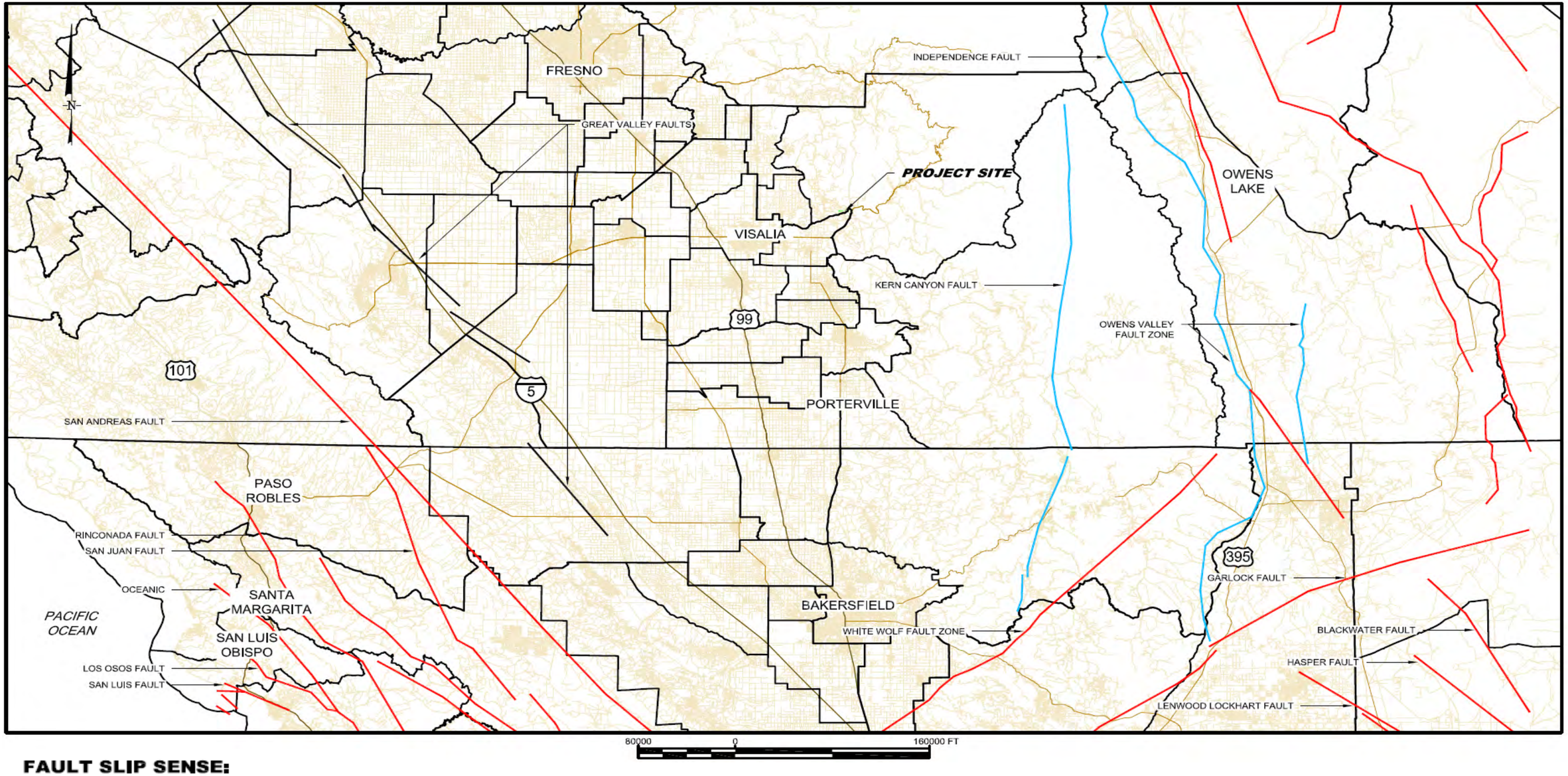
B-4 (82 - 85 ft)



B-4 (85 - 87 ft)

REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **PHOTOS OF BEDROCK CORES**	FIGURE No. **5** / REV

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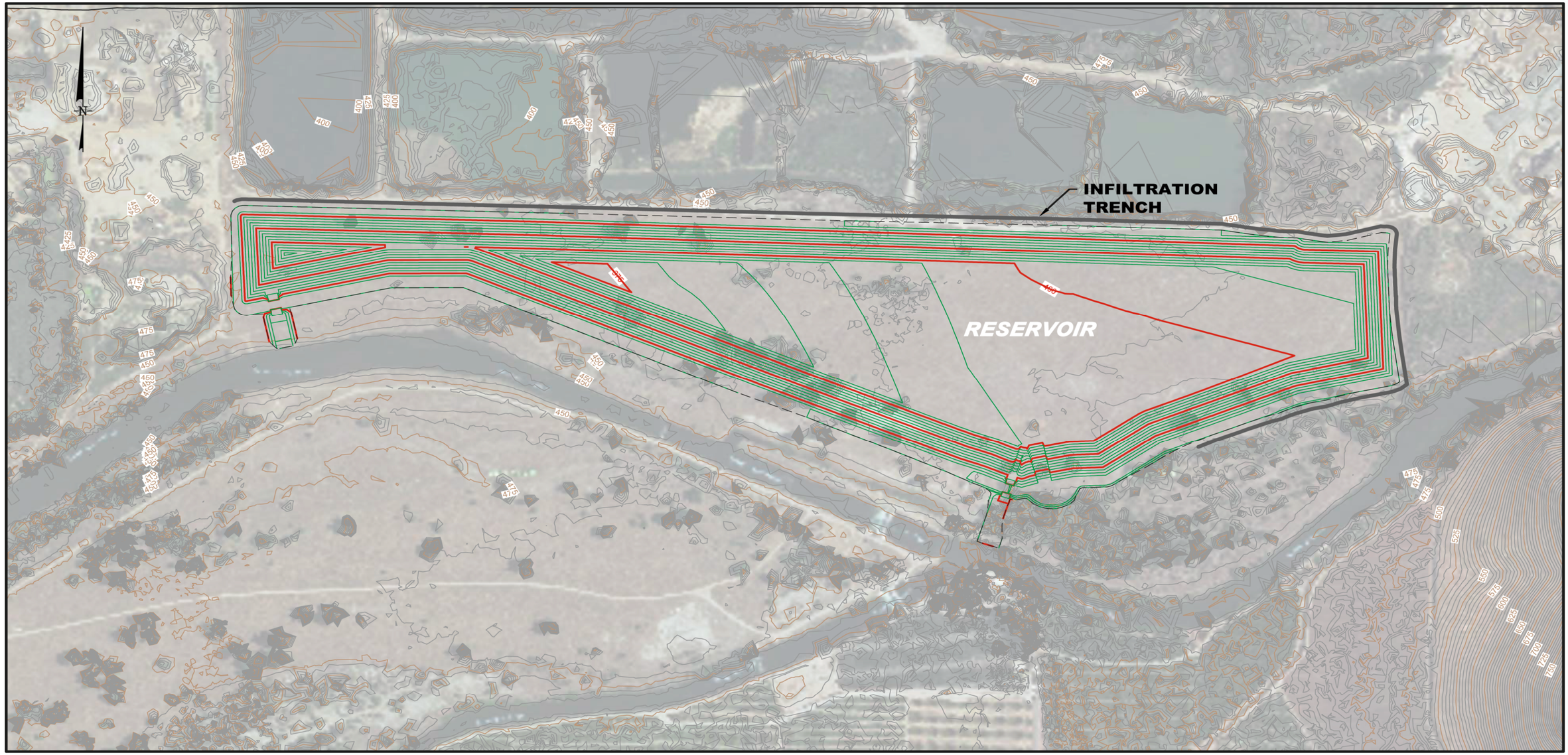


FAULT SLIP SENSE:

- STRIKE-SLIP
- THRUST –REVERSE (APPROXIMATE LOCATION)
- NORMAL

REPORT: **GEOLOGY AND SOILS**	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: DECEMBER 2021	
PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00002	
	TITLE: **ACTIVE FAULTS MAP**	FIGURE No.: **6**	REV:

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300 0 600 FT

LEGEND

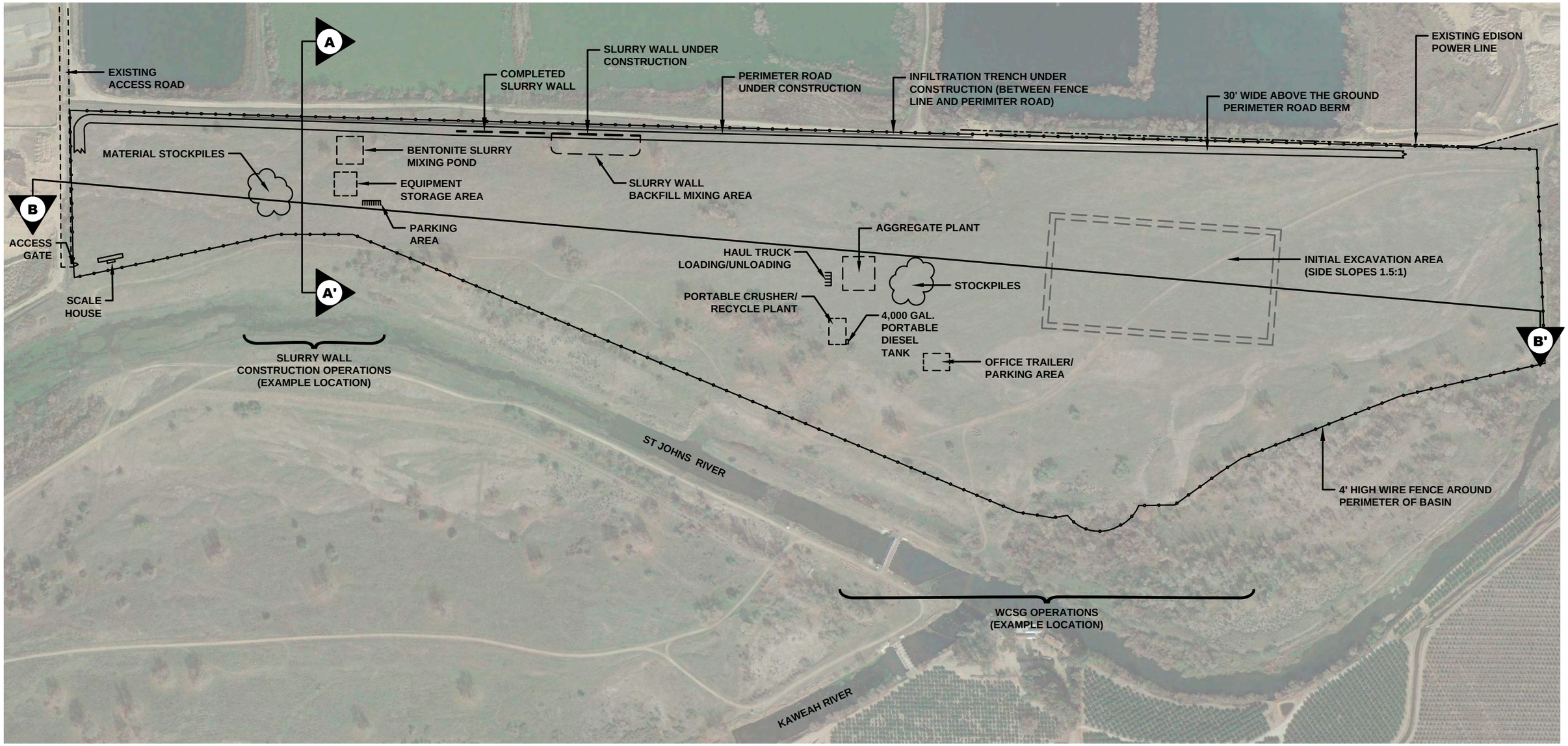
100 EXISTING GROUND SURFACE CONTOUR EL, FEET

100 PROPOSED GROUND SURFACE CONTOUR EL, FEET

RESERVOIR BOUNDARY

REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **EXISTING AND PROPOSED TOPOGRAPHY**	FIGURE No. **7**	REV

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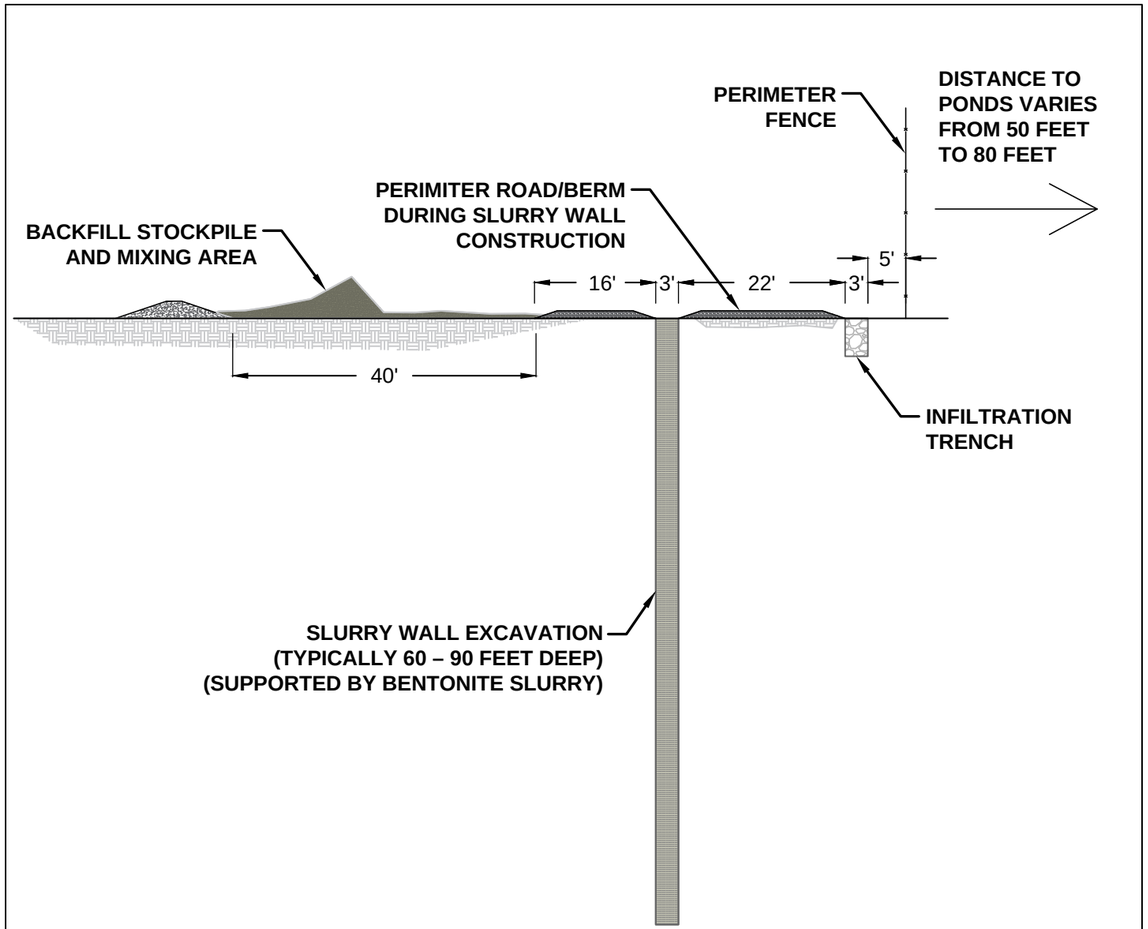


400 FT 0 800 FT

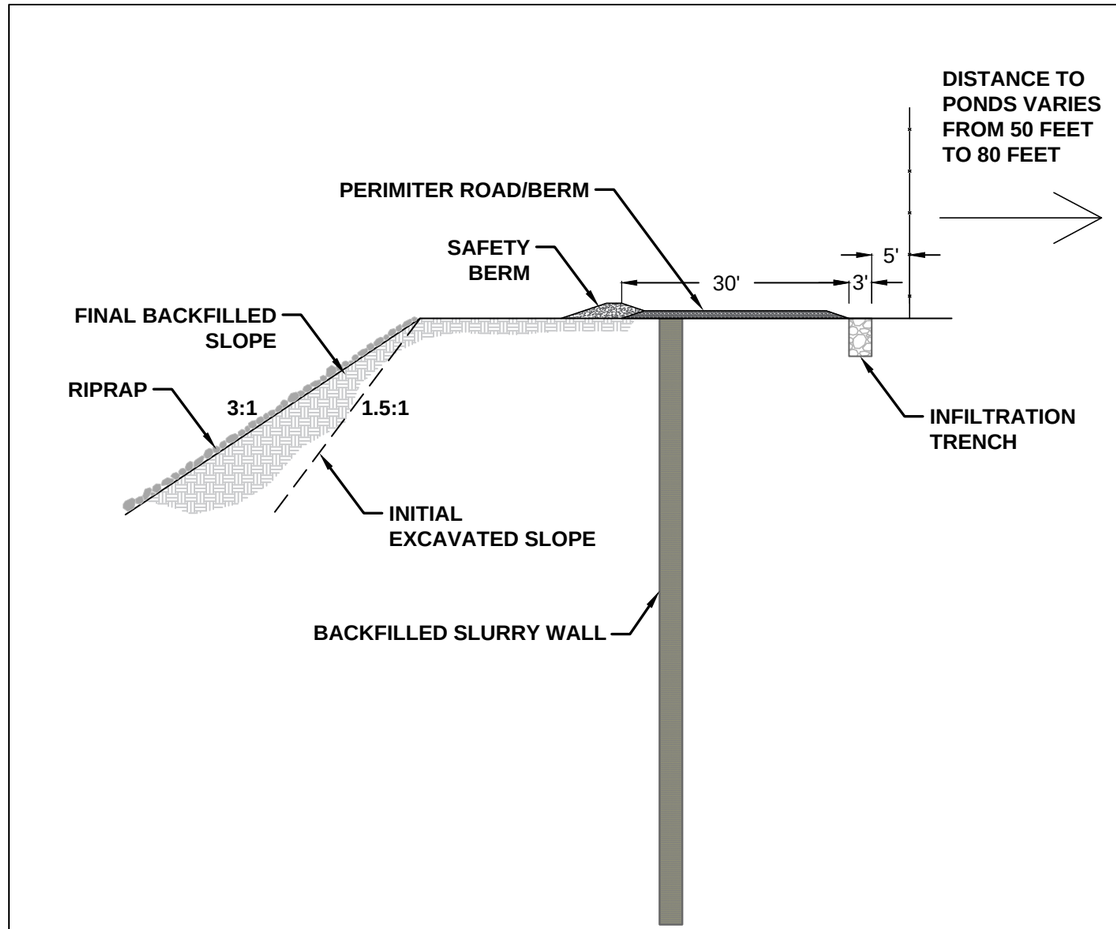
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	TITLE **INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION**	FIGURE No. **8** / REV.

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CROSS SECTION A-A'
DURING CONSTRUCTION OF SLURRY WALL



CROSS SECTION A-A'
COMPLETED RESERVOIR

NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE
AND FOR ILLUSTRATION PURPOSES ONLY

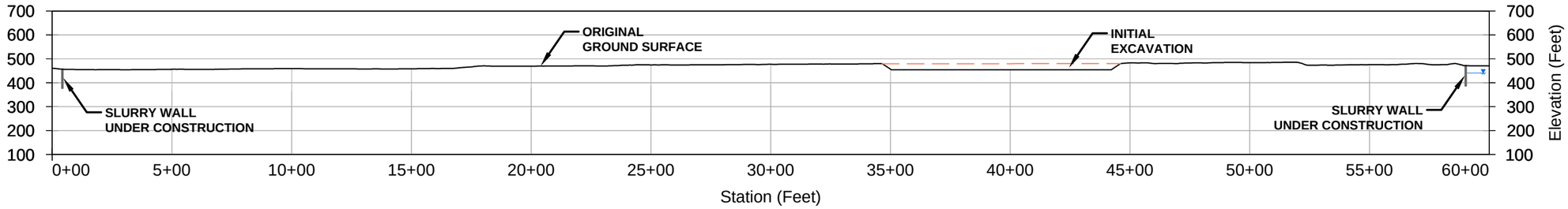
20 FT 0 40 FT

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	TITLE **PROFILE A–A'**	FIGURE No. **9** / REV.

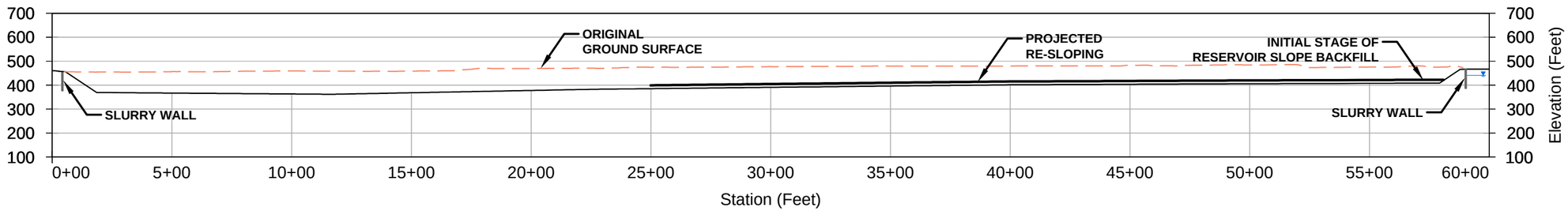
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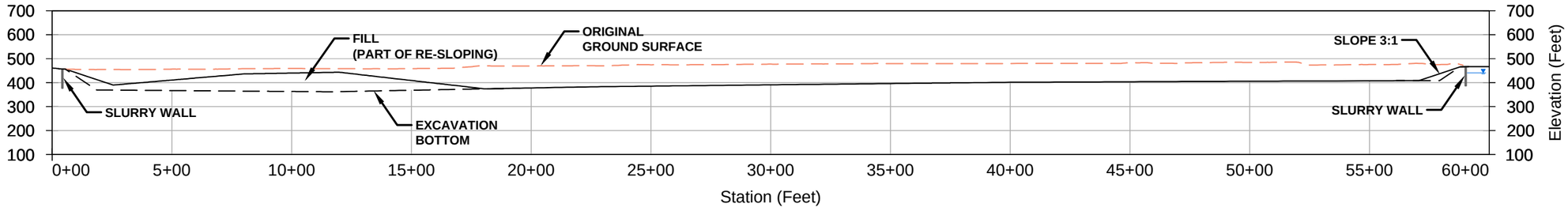
INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION



FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL



COMPLETED RESERVOIR

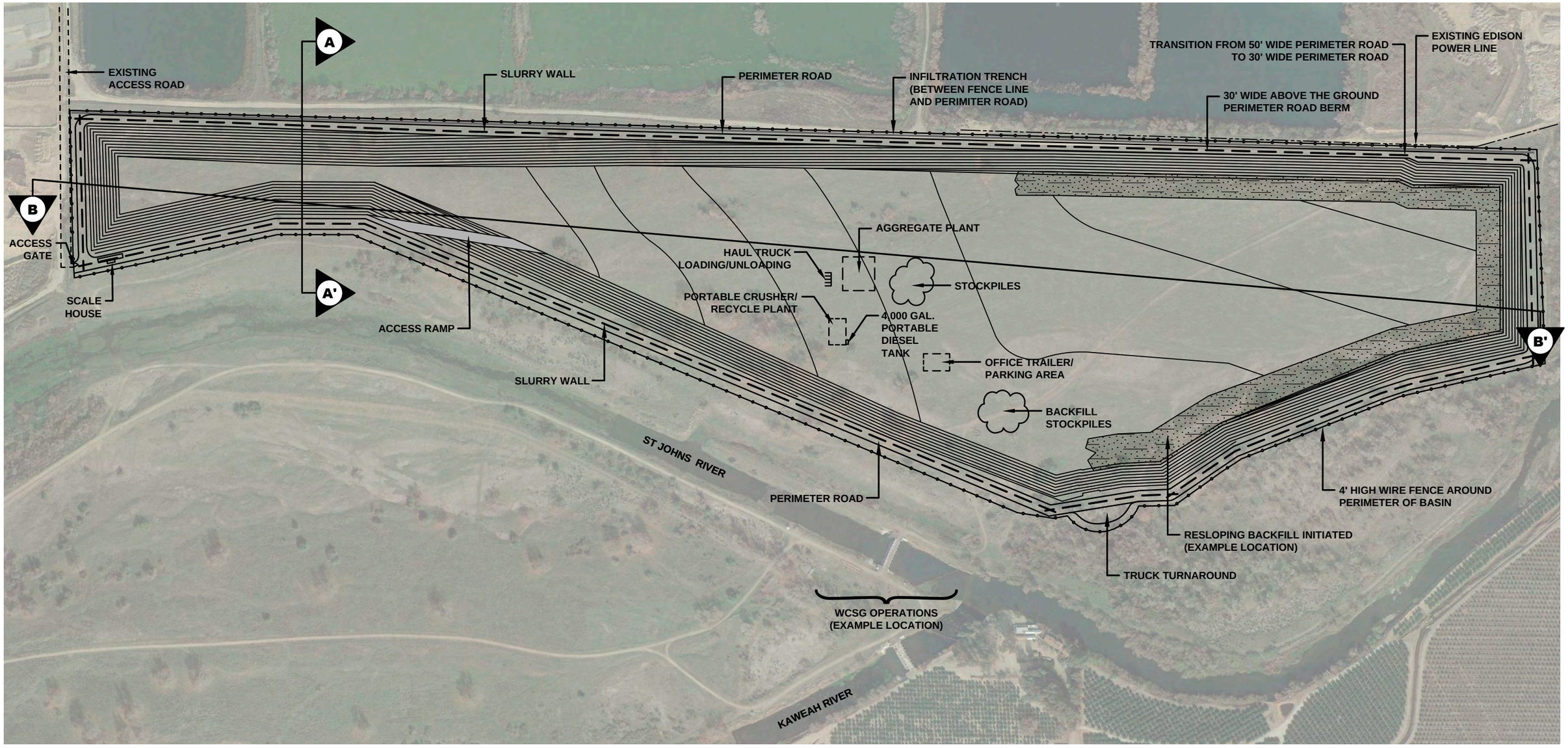


500 FT 0 1,000 FT

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	TITLE **PROFILE B–B'**	FIGURE No. **10** / REV.

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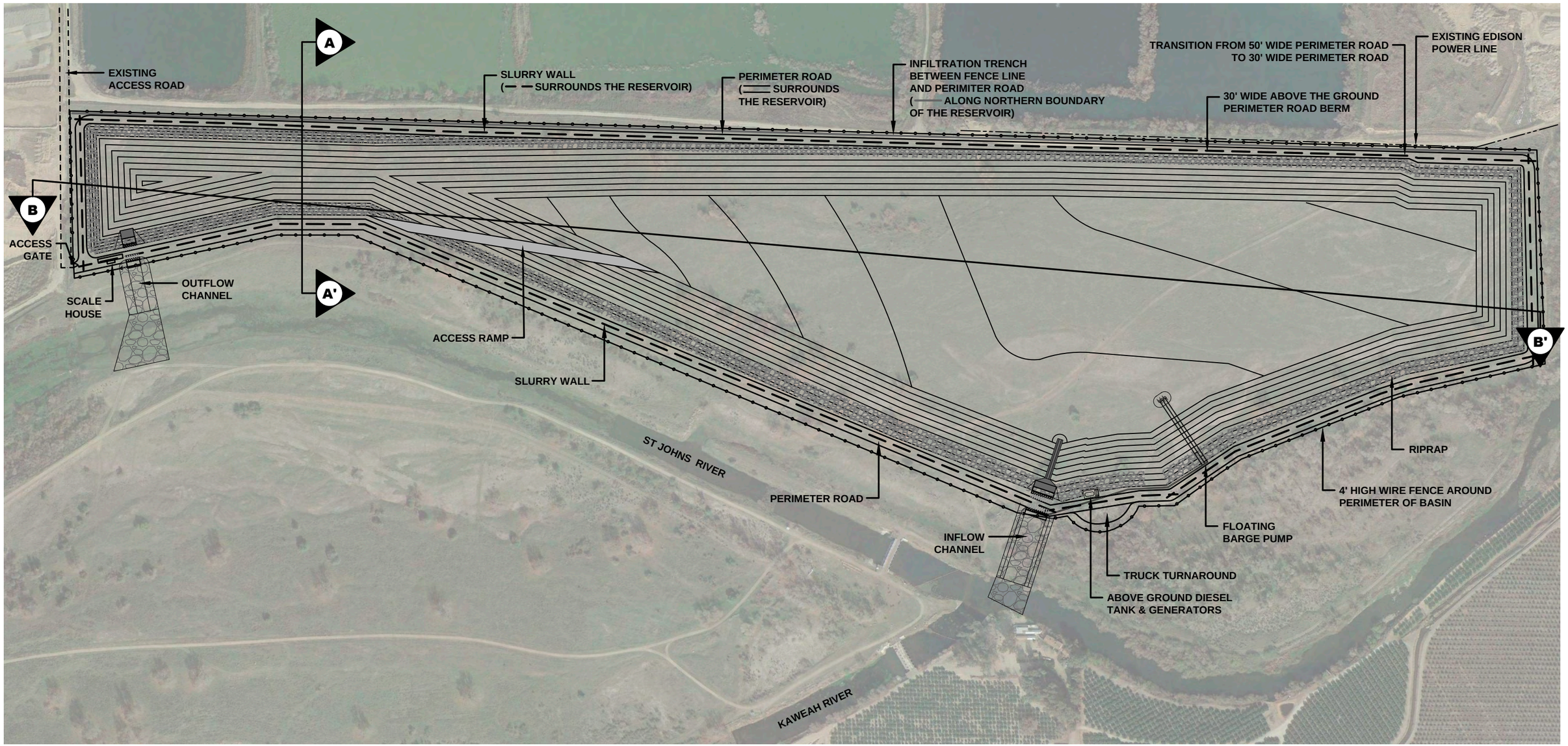
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400 FT 0 800 FT

REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
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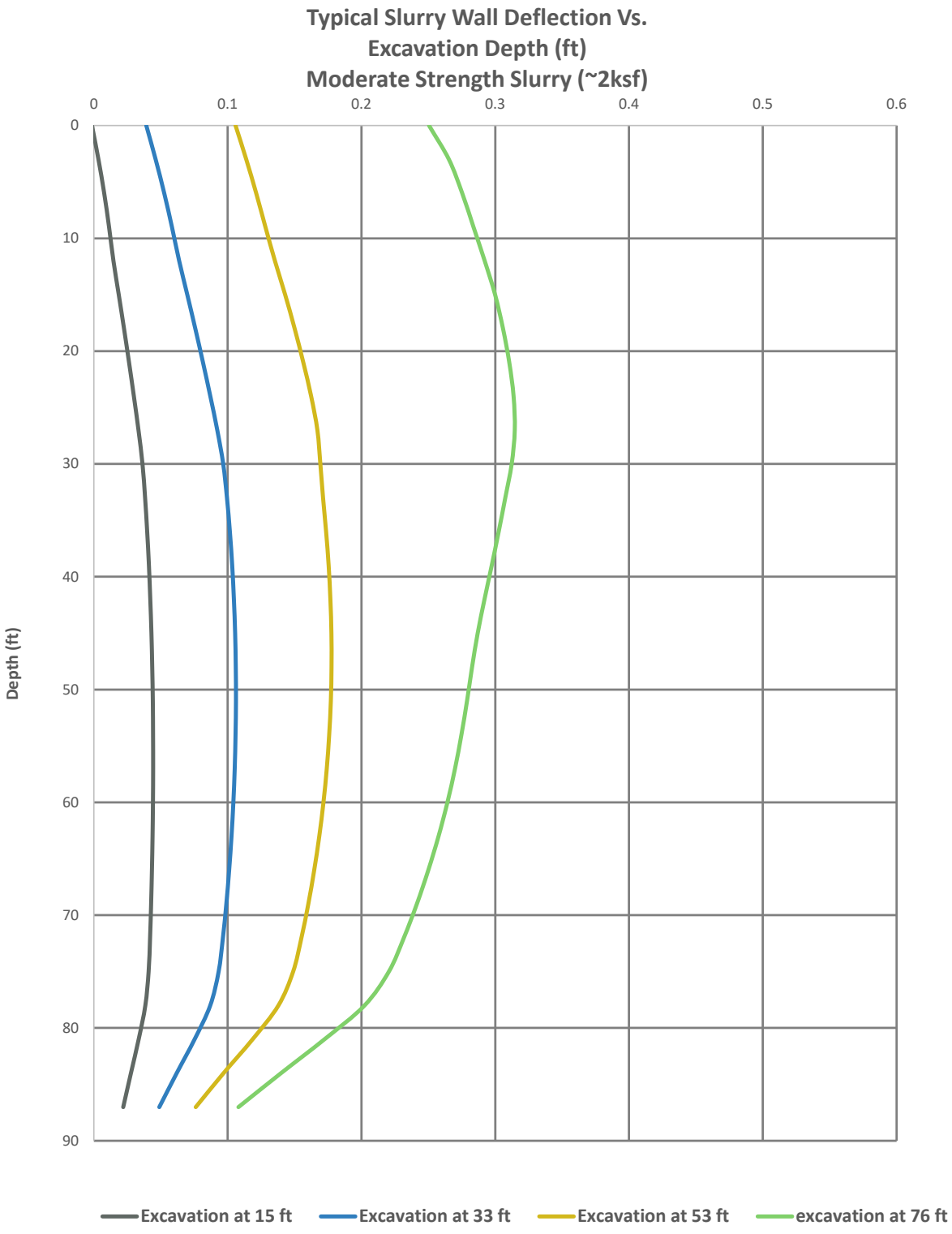


400 FT 0 800 FT

REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021
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	TITLE **COMPLETED RESERVOIR**	FIGURE No. **12** / REV.

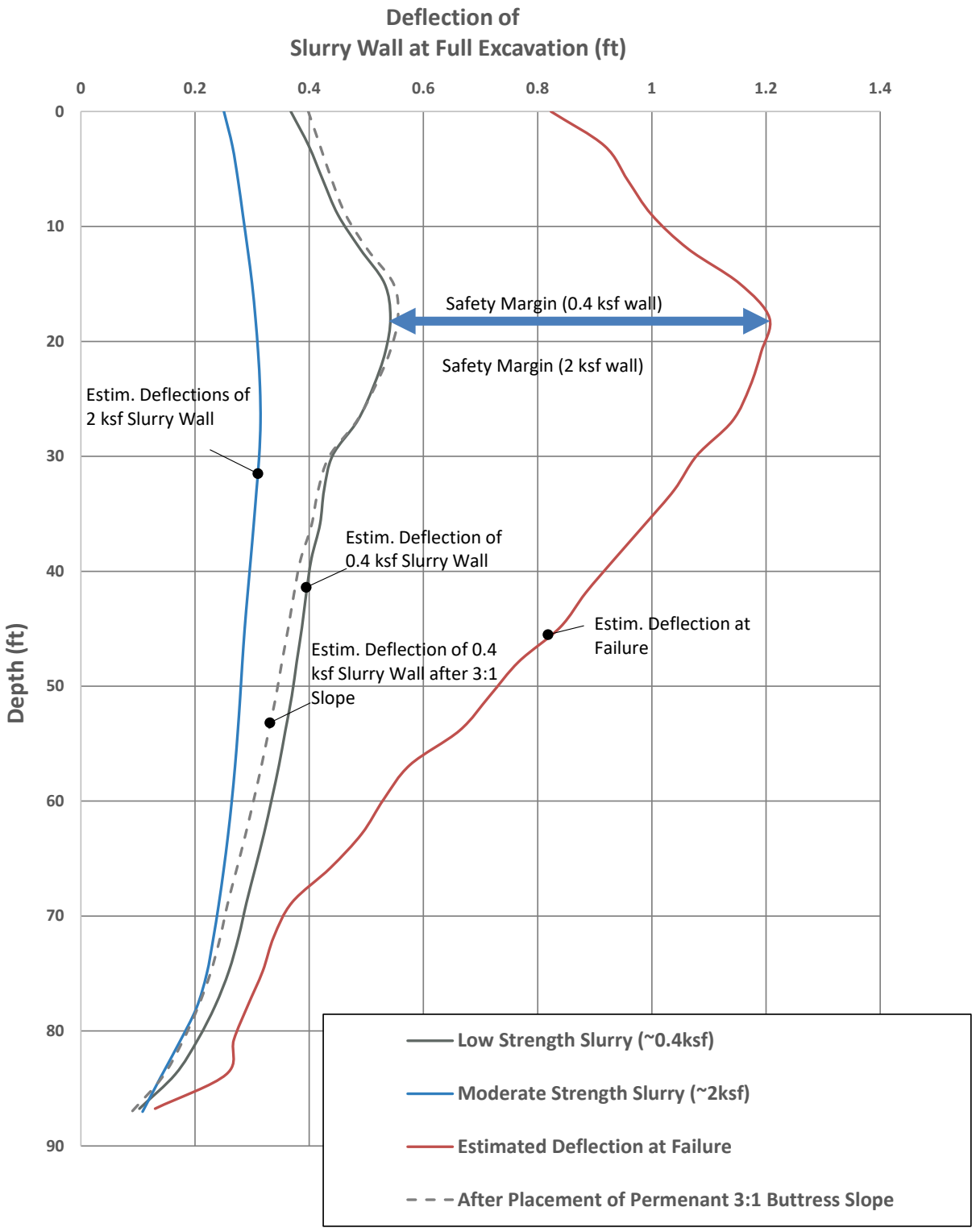
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REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE DECEMBER 2021
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **ESTIMATED SLURRY WALL DEFLECTIONS DURING EXCAVATION**	DRAWING No. **13** / REV

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PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **ESTIMATED DEFLECTIONS OF SLURRY WALL AT FULL EXCAVATION**	DRAWING No. **14**	REV

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APPENDICES

DRAFT

ATTACHMENT A

AVAILABLE SUBSURFACE INFORMATION

- Boring Logs

- Subsurface Cross-Sections

BORING LOGS

(BSK, 2011)

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-1

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **458.0**

Location: **N 36.39334, W 119.05555**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light orange brown; medium grained; moist.										
10		… GRAVELLY SAND: Olive gray; coarse grained; moist; with cobbles, increasing to 13 ft.										
15		GP: GRAVEL: Olive gray; coarse sized; moist; with hard rounded cobbles.										
		… GRAVEL: Olive gray; coarse sized; wet; with cobbles.										
20		▽ … GRAVEL WITH COBBLES: (no recovery, very easy drilling, soil type estimated).										
25		… GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles increasing size to 4 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; cobbles to >4 in.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; coarse sized; wet; cobbles decreasing size to 2 in gravel.										
40												
45		… CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; 3 in. rounded cobbles.										
50												
55		SP: SAND: Olive gray; coarse grained; wet.										
60		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
65		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; brittle rounded cobbles.										
		… SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles increasing size to >4 in.										
70		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
75		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles size to 3 in.										
		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 20 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-2

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39318, W 119.05082**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light orange brown; medium grained; moist.										
5												
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; moist; with hard rounded coarse gravel.										
		▽										
20		… SAND WITH COBBLES: Olive gray; coarse grained; wet; with hard rounded coarse gravel.										
25		GP: GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles size to 3 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse grained; .										
35												
40		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
45												
50		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained, brittle gravel; wet.										
55		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained, brittle gravel; wet.										
60		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; .										
65		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; wet; hard cobbles to 3 in.										
70		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained; wet.										
75		… CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 17 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-3

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **465.0**

Location: **N 36.39138, W 119.04547**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light gray to white; medium grained; moist.										
5		" "										
10												
15		… SAND WITH GRAVEL: Light gray to white; coarse grained; moist; gravel increasing size. ▽										
20		GP: GRAVEL: Bluish gray; medium to coarse sized; wet.										
25												
30		SC: CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; hard rounded 3 in. cobbles. … CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; cobbles decreasing size to 2 in. gravel.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; occasional cobbles.										
40												
45		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
50		SP: SAND WITH COBBLES: Olive brown; coarse grained; wet; cobble size>4 in. … SAND WITH COBBLES: Olive brown; coarse grained; wet; very hard drilling from 49-52 ft.										
55		… SAND: Olive brown; medium grained; wet.										
60		SC: CLAYEY SAND: Olive brown; medium grained; moist.										
65		SP: SAND: Gray; coarse grained; moist.										
70		SM: SILTY SAND: Gray; medium to coarse grained; moist.										
75		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
80		" "										
85		" "										
90		" "										
95		End of boring.										
100												

Completion Depth: **93.0**
Date Started: **11/17/11**
Date Completed: **11/17/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 93 feet. Boring backfilled with grout. Groundwater encountered at 18 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-4

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **467.0**

Location: **N 36.39336, W 119.04339**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light gray to white; medium grained; moist.										
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; ▽ moist; with cobbles, increasing to 17 ft.										
20		GP: SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles to>4 in.										
25		… SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles, decreasing size fine gravel.										
30												
35												
40		SC: CLAYEY SAND: Yellowish brown; medium grained; wet; with gravel.										
45		SM: SILTY SAND: Yellowish brown; medium grained; wet; with coarse gravel. … SILTY SAND: Yellowish brown; medium to coarse grained; wet; with small cobbles and coarse gravel. … SILTY SAND: Light gray to white; dry.										
50												
55												
60		SP: SAND: Olive gray; coarse grained; dry.										
65												
70		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry. " "										
75		" "										
80												
85												
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 15 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-5

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39099, W 119.04826**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light gray to white; medium grained; moist.										
10												
15		▽ GP: SANDY GRAVEL: Olive gray; coarse grained; moist; increasing gravel to small cobbles.										
20		… SANDY GRAVEL WITH COBBLES: Olive gray; coarse grained; wet; increasing cobble size to >4 in.										
25												
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 3-4 in.										
35												
40		… CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 2-3 in., decreasing to gravel.										
45		CL: SANDY CLAY WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; decreasing gravel to sand.										
50												
55		SC: CLAYEY SAND WITH GRAVEL: Yellowish brown; medium grained; wet.										
60		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
65												
70		SC: CLAYEY SAND: Olive gray; fine to medium grained; moist; very hard drilling.										
75		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
80		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
85												
90		Core barrel refusal at 87 ft. End of boring.										
95												
100												

Completion Depth: **87.0**
Date Started: **11/16/11**
Date Completed: **11/16/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 87 feet. Boring backfilled with grout. Groundwater encountered at 14 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-6

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **466.0**

Location: **N 36.38976, W 119.04018**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: POORLY GRADED SAND: Light gray to white; medium grained; moist.										
5		SW-SM: WELL GRADED SAND WITH SILT: Light gray to white; medium grained; moist.										
		▽ SW: WELL GRADED SAND: Light gray to white; fine to medium grained; wet.										
10		SP-SM: POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; fine to coarse grained with gravel; wet; with rounded cobbles to >4 in.										
15		… POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; medium to coarse grained with gravel; wet; with rounded cobbles, decreasing size.										
20		GM: SILTY GRAVEL WITH COBBLES: Olive gray; coarse sized, with fine to medium grained sand; wet; with rounded cobbles.										
25		SM: SILTY SAND: Olive gray; fine to medium grained; wet; increasing silt decreasing cobbles.										
30		… SILTY SAND: Olive gray; fine to medium grained; wet.										
		… SILTY SAND: Olive gray; medium grained; wet; with gravel.										
35		" "										
40		… SILTY SAND: Olive gray; fine to coarse grained; moist.										
45		… SILTY SAND: White & Black; fine to medium grained; moist.										
50		SC: CLAYEY SAND: Bluish gray; medium grained; moist.										
55		SM: SILTY SAND: Bluish gray; medium grained; moist.										
60		" "										
65		… SILTY SAND: Bluish gray; medium grained; moist; with gravel.										
70		CL: SANDY CLAY WITH GRAVEL: Bluish gray; dry; with cobbles.										
75		GRANITIC ROCK: With 20 to 30% mafic minerals; cobble to boulder sized fractured pieces in core barrel; dry.										
80		" "										
85		" "										
90		" "										
95		End of boring.										
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 7 ft.

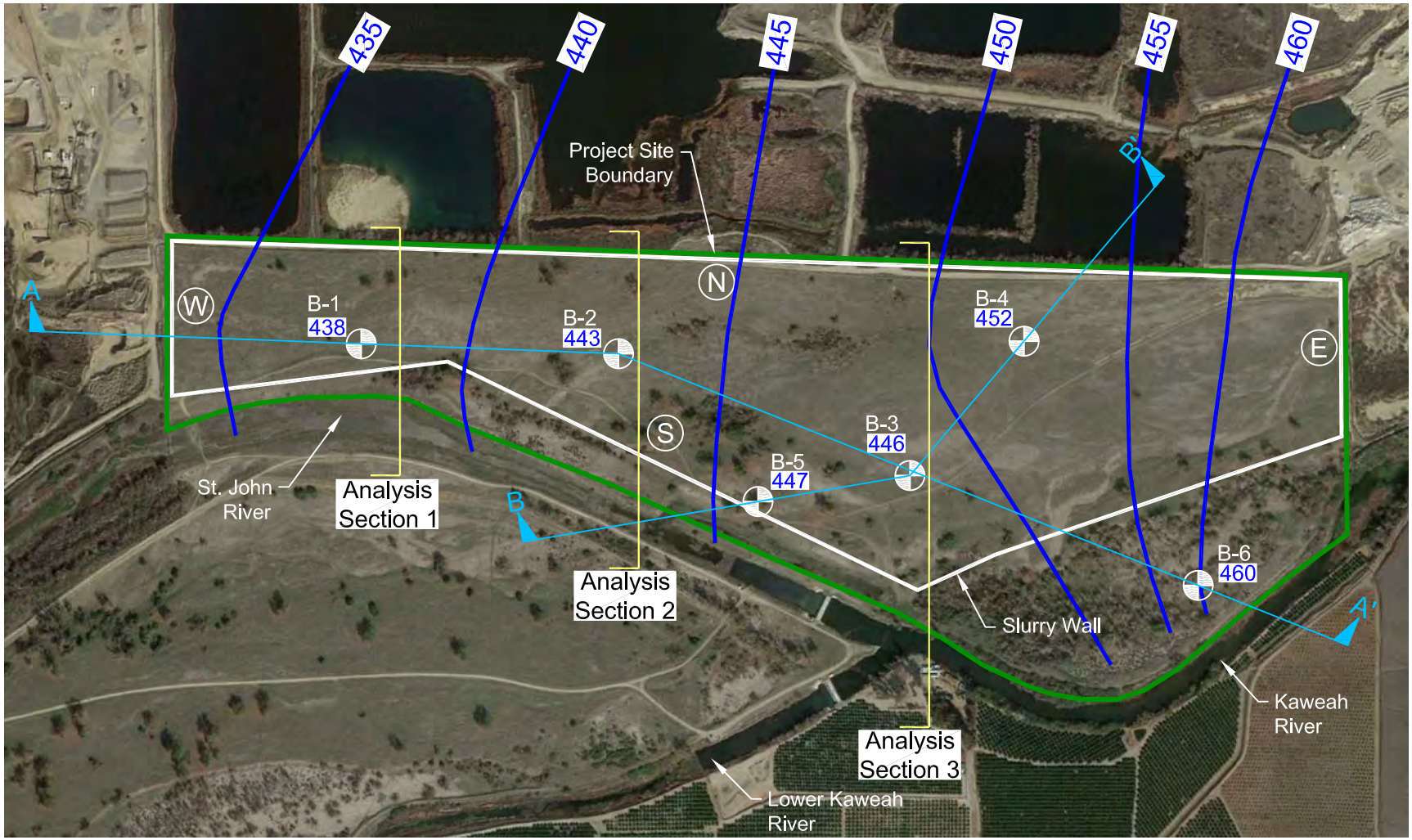
GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 1/16/12

SUBSURFACE CROSS-SECTIONS

(SLR, 2015)

(SES, 2012)

(SCHMIDT, 2012)



LEGEND

GEOLOGIC CROSS-SECTION A-A' & B-B'

ANALYSIS SECTION

N

0 800 1,600

SCALE (FEET)

Source: Image from Google Earth Pro

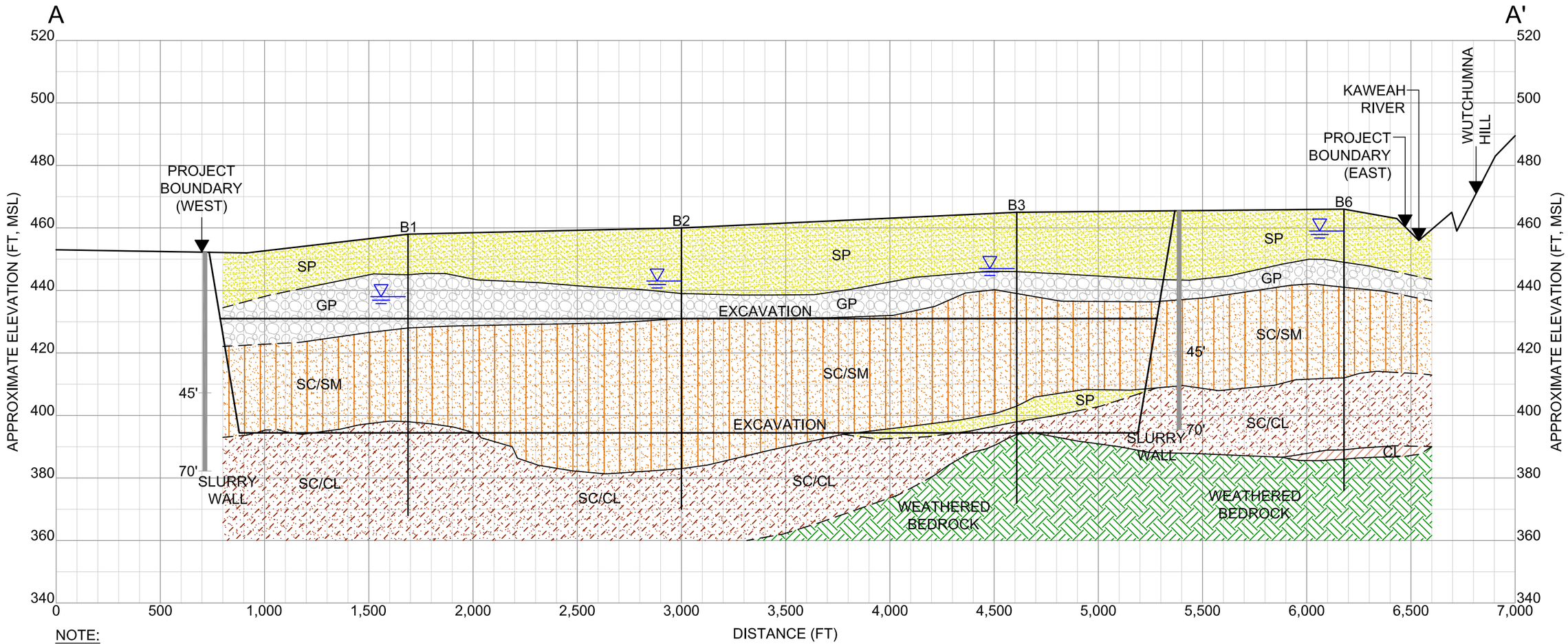
Seepage Analysis Section and Boring Location Map

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

January 2015

SLR Consulting USA Pty Ltd
Consulting Engineers & Scientists

N:\Irvine\CAD\0228-SESPE-McKay Point\04_REFERENCE\0228_Cross Sections.dwg 2/5/2015 3:24 PM



NOTE:
1. SANDOVAL DOMESTIC WELL LOCATED APPROXIMATELY 4,000 FEET WEST OF SECTION. WATER ELEVATION = 440.98

LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- CL: Clay
- GROUNDWATER ELEVATION DURING DRILLING

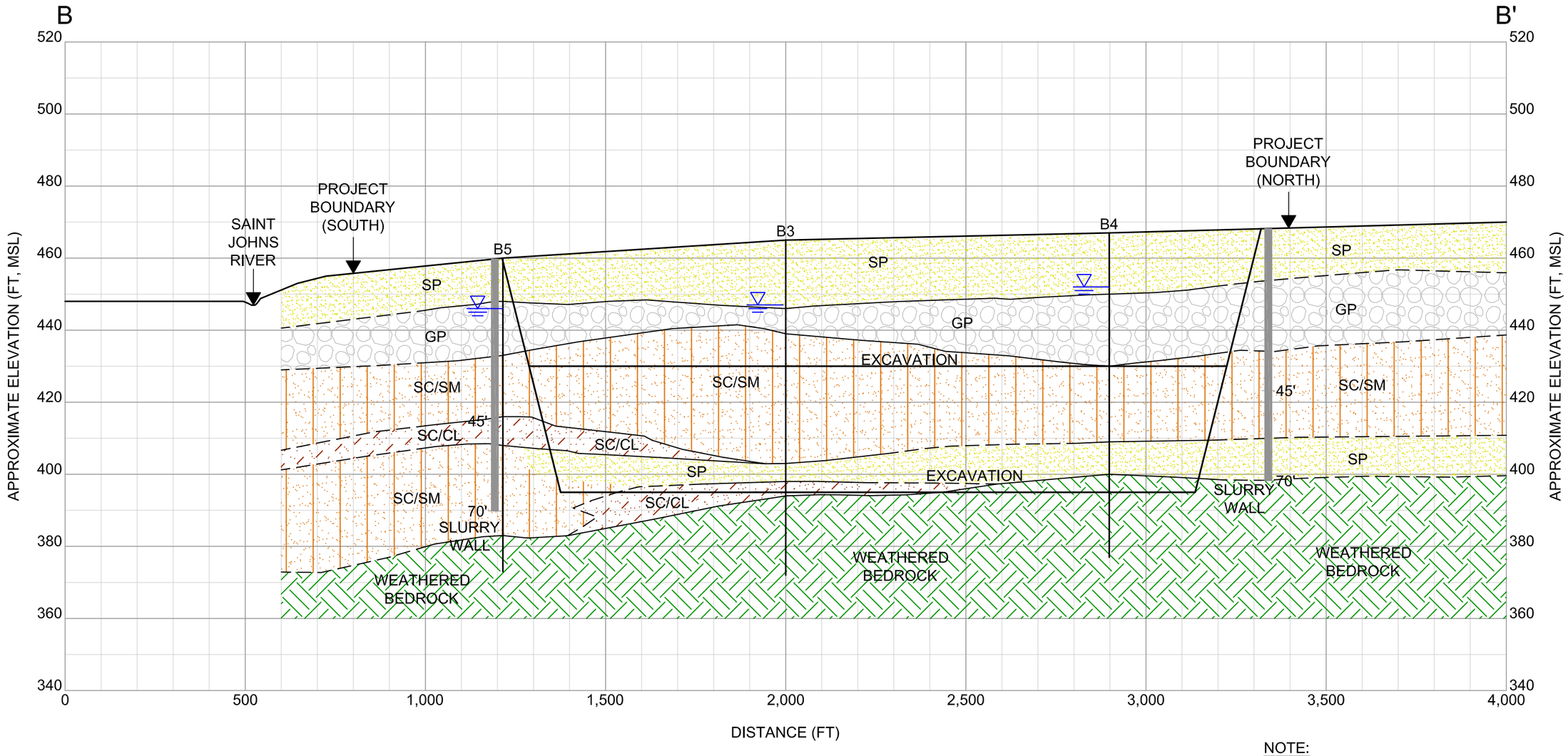
0 500 1,000
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x15

Cross Section A-A'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 2 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

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LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- GROUNDWATER ELEVATION DURING DRILLING

NOTE:
1. HEIDMAN WELL LOCATED APPROXIMATELY 2,600 FEET NORTH OF SECTION. WATER ELEVATION = 460.02

0 300 600
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x10

Cross Section B-B'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 3 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

P:\CAD\0228 McKay Point\0228_Cross Sections.dwg 7/11/12 13:13

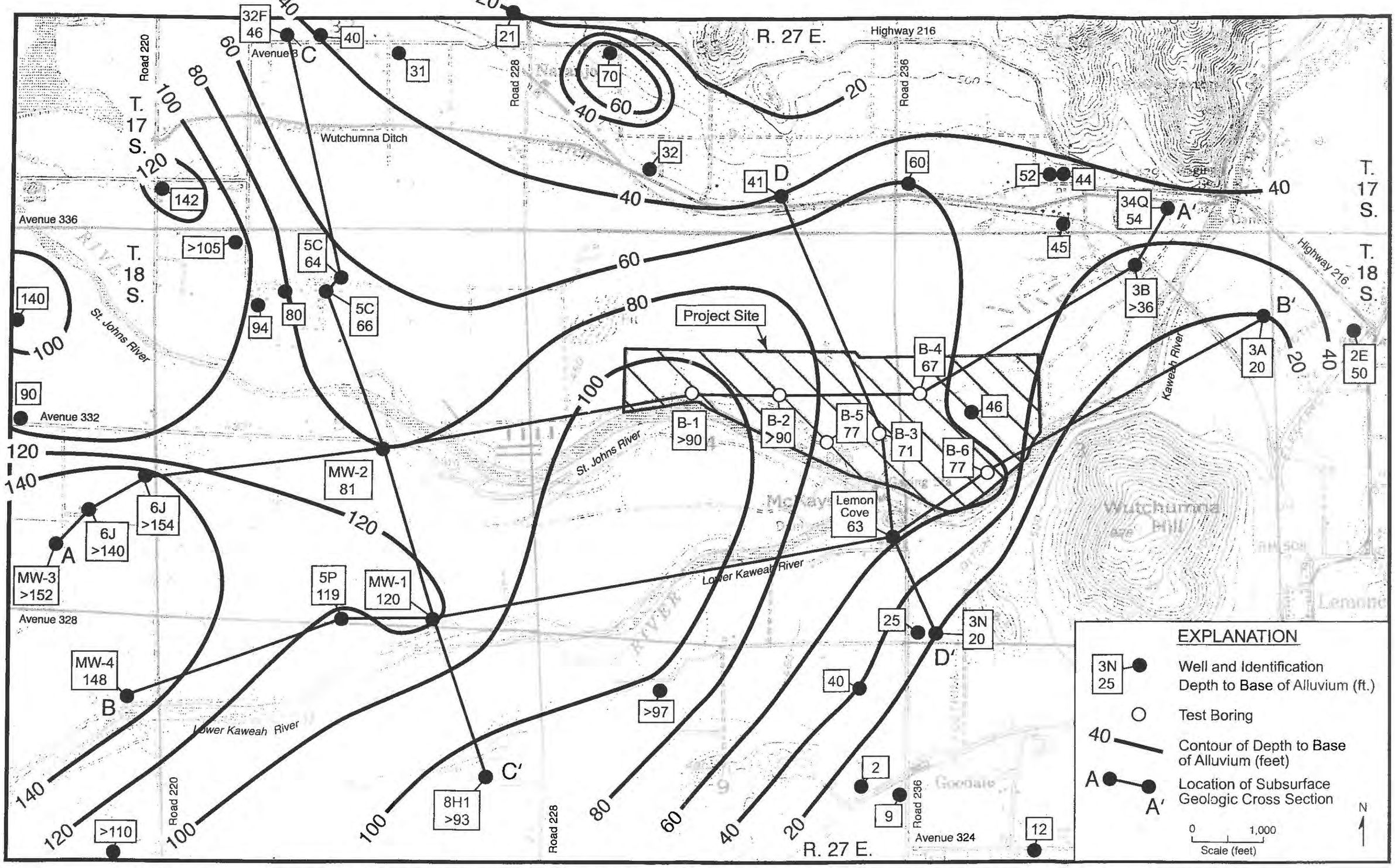


FIGURE 1 - LOCATION OF SELECTED WELLS, TEST HOLES, SUBSURFACE GEOLOGIC CROSS SECTIONS, AND DEPTH TO BASE OF ALLUVIUM

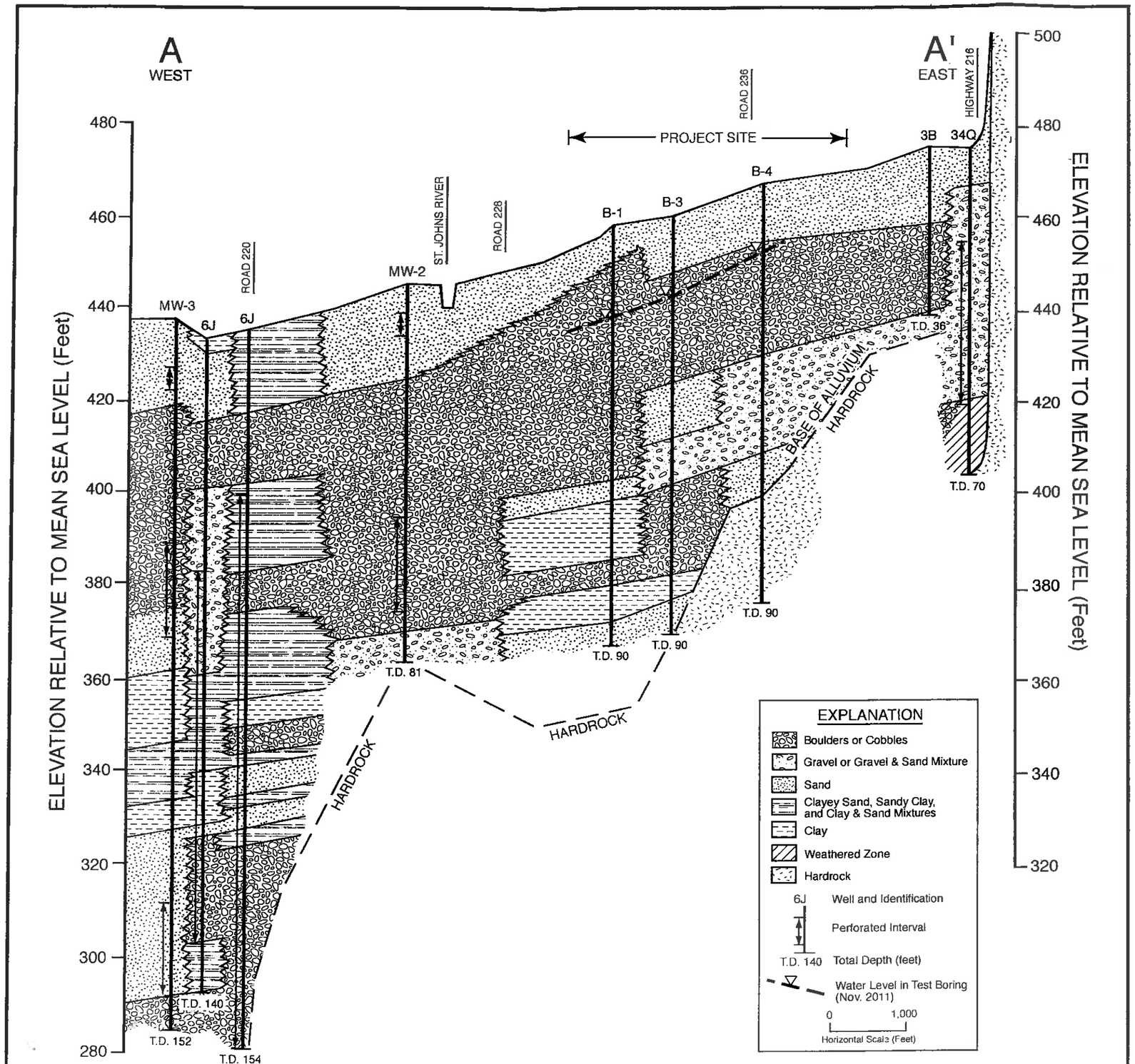


FIGURE 2 - SUBSURFACE GEOLOGIC CROSS SECTION A - A'

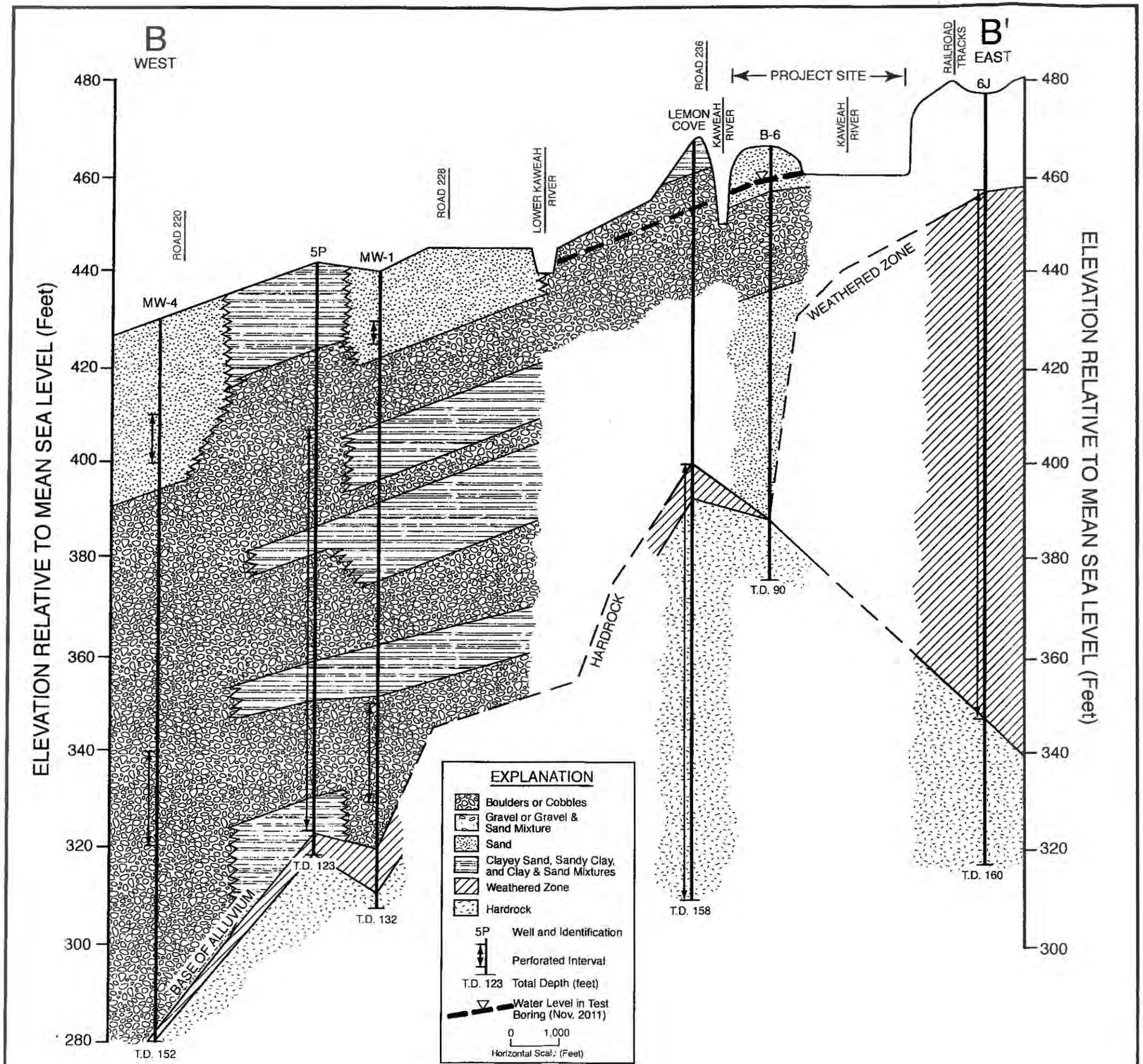


FIGURE 3 - SUBSURFACE GEOLOGIC CROSS SECTION B - B'

C
NORTH

C'
SOUTH

460
440
420
400
380
360
340
320
300
280
260

ELEVATION RELATIVE TO MEAN SEA LEVEL (Feet)

32F
WUTCHUMNA DITCH
ST. JOHNS RIVER
LOWER KAWEAH RIVER
5C 5C
MW-2
MW-1
8H1
BASE OF ALLUVIUM
TOP OF WEATHERED ZONE
TOP OF HARDROCK
WEATHERED ZONE
HARDROCK
T.D. 110
T.D. 130
T.D. 81
T.D. 93
T.D. 132
T.D. 190
O.H. 70

EXPLANATION

- Boulders or Cobbles
- Gravel or Gravel & Sand Mixture
- Sand
- Clayey Sand, Sandy Clay, and Clay & Sand Mixtures
- Clay
- Weathered Zone
- Hardrock
- 32F — Well and Identification
- Perforated Interval
- T.D. 110 — Total Depth (feet)

0 1,000
Horizontal Scale (Feet)

FIGURE 4 - SUBSURFACE GEOLOGIC CROSS SECTION C - C'

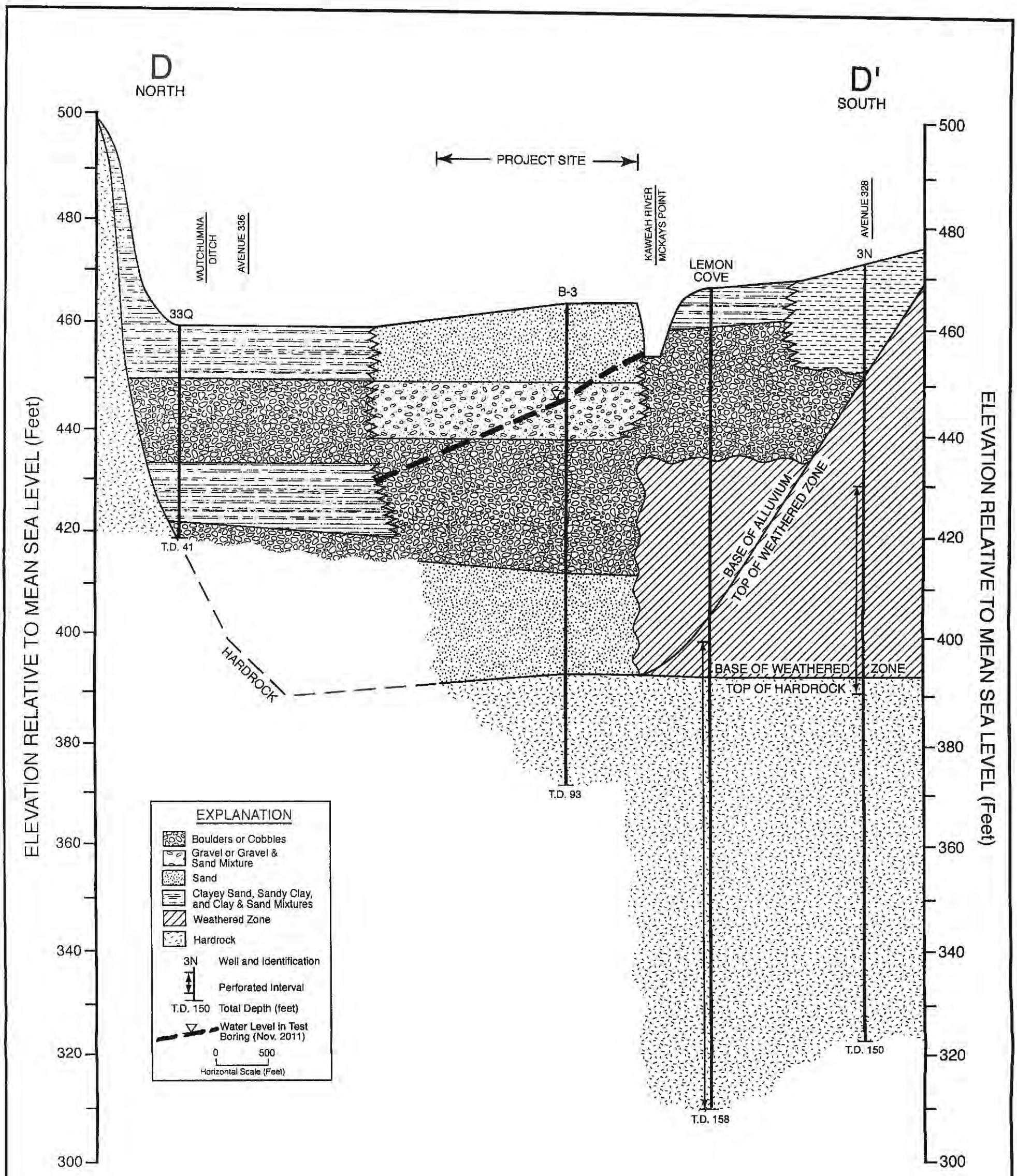
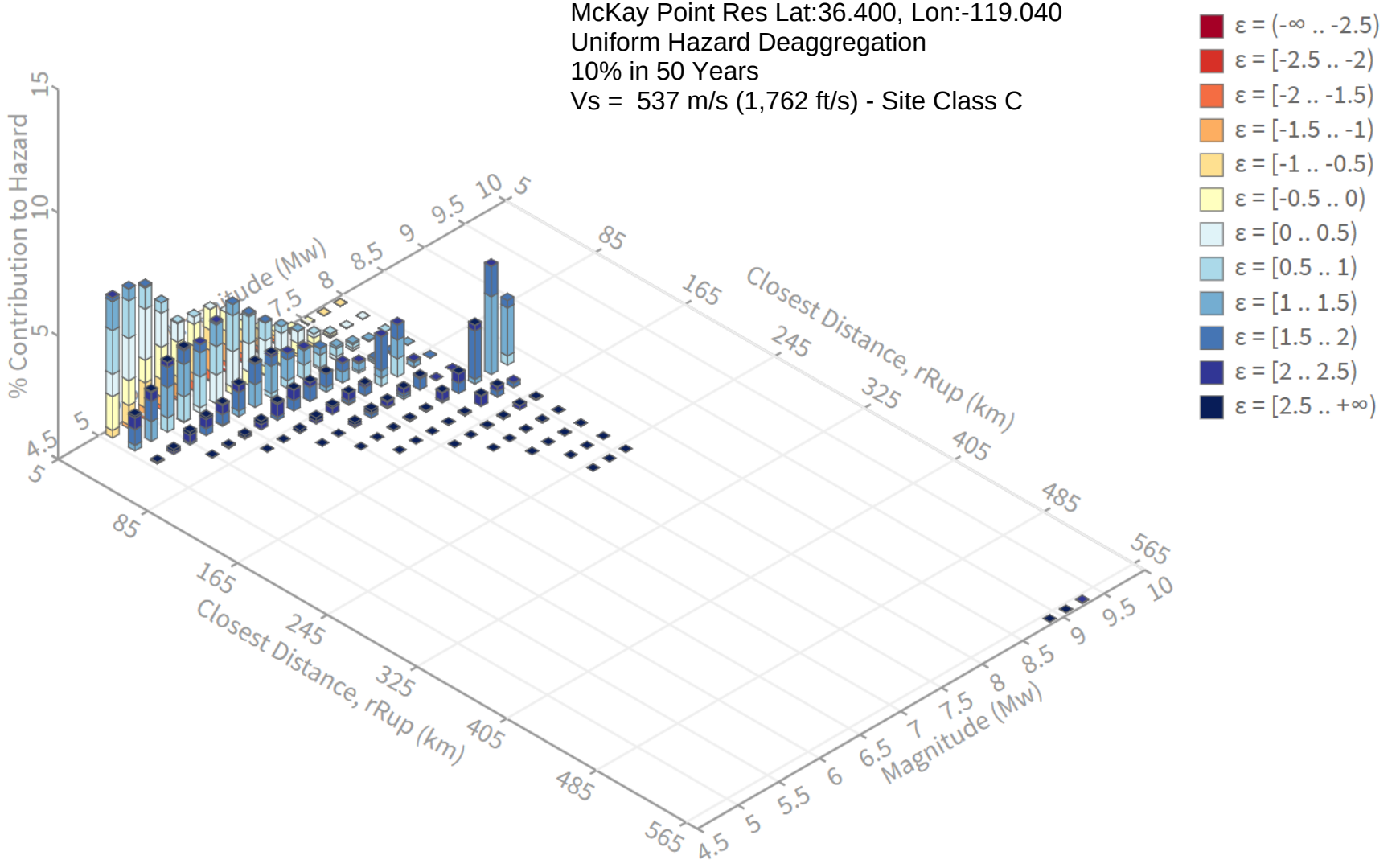


FIGURE 5 - SUBSURFACE GEOLOGIC CROSS SECTION D - D'

ATTACHMENT B

PROBABILISTIC SEISMIC HAZARD ANALYSIS (PHSA) OUTPUTS

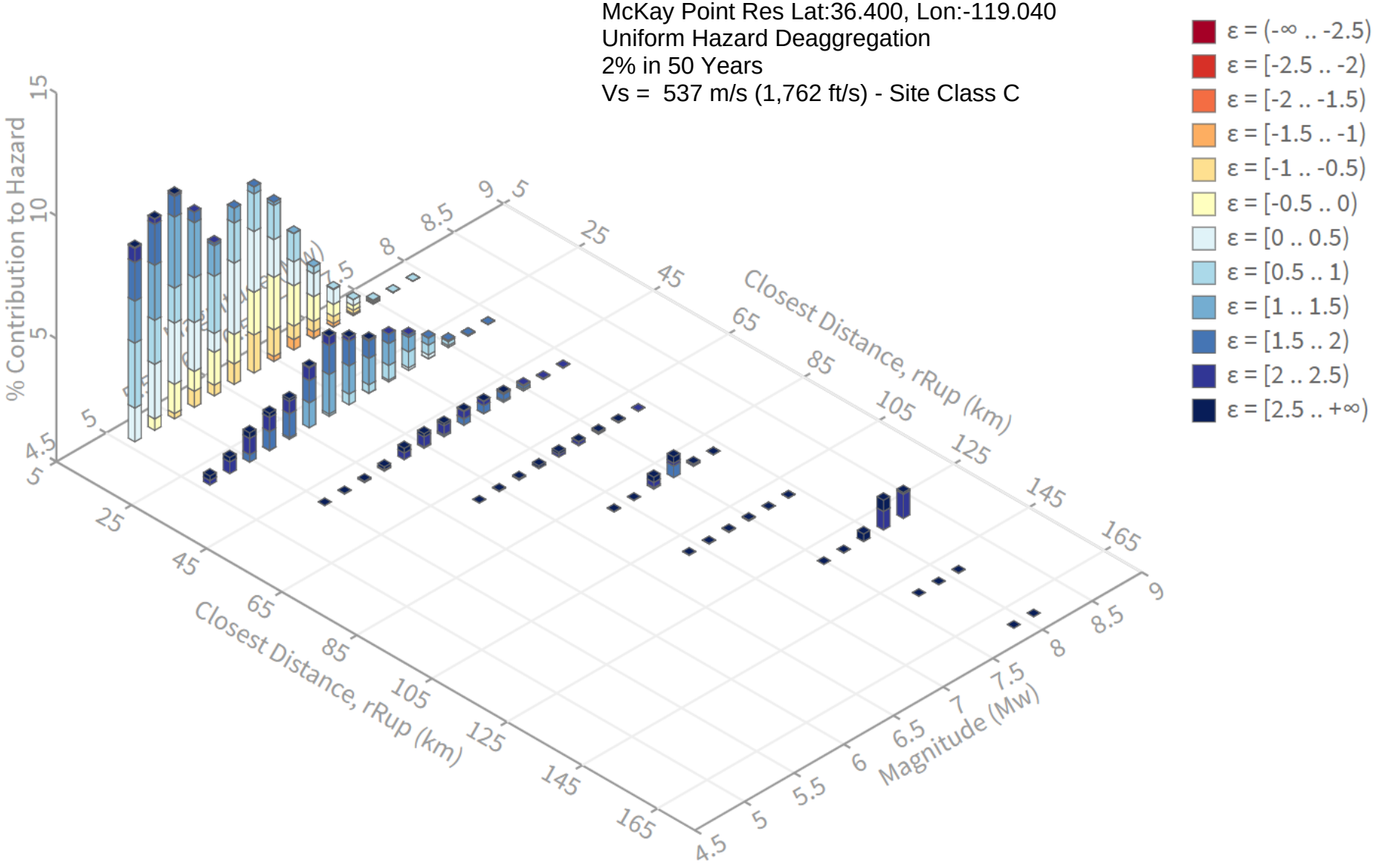
McKay Point Res Lat:36.400, Lon:-119.040
Uniform Hazard Deaggregation
10% in 50 Years
Vs = 537 m/s (1,762 ft/s) - Site Class C



Summary statistics for, Deaggregation: Total

Deaggregation targets	Recovered targets	Totals	Mean (over all sources)
Return period: 475 yrs	**Return period:** 508.96403 yrs	**Binned:** 100 %	**m:** 6.38
Exceedance rate: 0.0021052632 yr^{-1}	**Exceedance rate:** 0.0019647754 yr^{-1}	**Residual:** 0 %	**r:** 45.78 km
PGA ground motion: 0.1323948 g		**Trace:** 0.31 %	**ε_0:** 0.72 σ

McKay Point Res Lat:36.400, Lon:-119.040
Uniform Hazard Deaggregation
2% in 50 Years
Vs = 537 m/s (1,762 ft/s) - Site Class C



Summary statistics for, Deaggregation: Total

Deaggregation targets	Recovered targets	Totals	Mean (over all sources)
Return period: 2475 yrs	**Return period:** 2665.1582 yrs	**Binned:** 100 %	**m:** 6.13
Exceedance rate: 0.0004040404 yr^{-1}	**Exceedance rate:** 0.00037521225 yr^{-1}	**Residual:** 0 %	**r:** 20.52 km
PGA ground motion: 0.26089426 g		**Trace:** 0.18 %	**ε_0:** 0.83 σ

ATTACHMENT C

SLOPE AND SLURRY WALL STABILITY

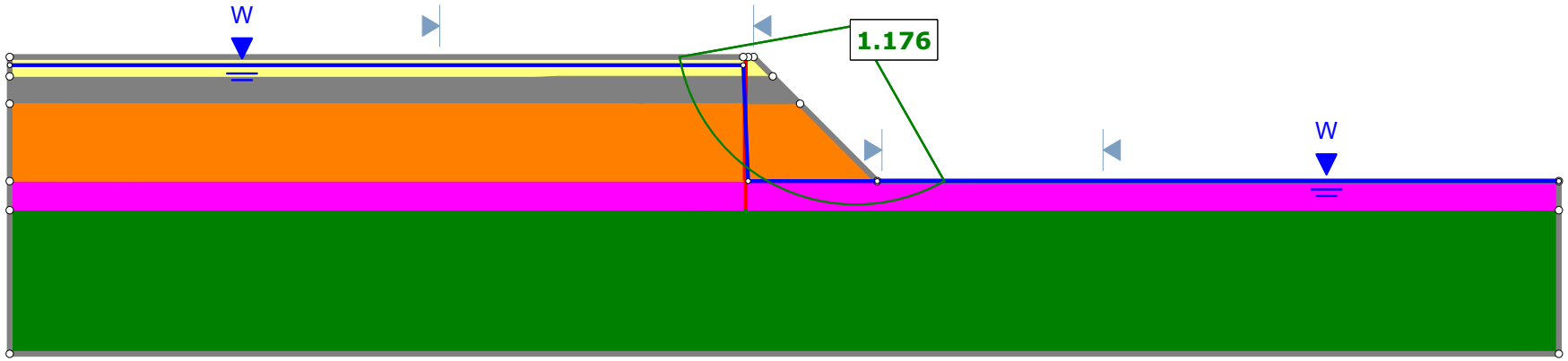
(LIMIT EQUILIBRIUM)

- **Temporary 1H:1V**
- **Temporary 1.25H:1V**
- **Temporary 1.5H:1V**
- **Permanent 3H:1V**
- **3H:1V Rapid Drawdown**
- **3H:1V Pseudostatic**

TEMPORARY

1H:1V

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1



REPORT - - - -

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Consulting Engineers & Scientists
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Tel: (949) 553-8417

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CLIENT: **SESPE CONSULTING, INC.**

PROJECT: **MCKAY POINT RESERVOIR PROJECT**

TITLE: **TEMPORARY 1:1 SLOPE**
FULLY DEWATERED
LOW STRENGTH SLURRY WALL

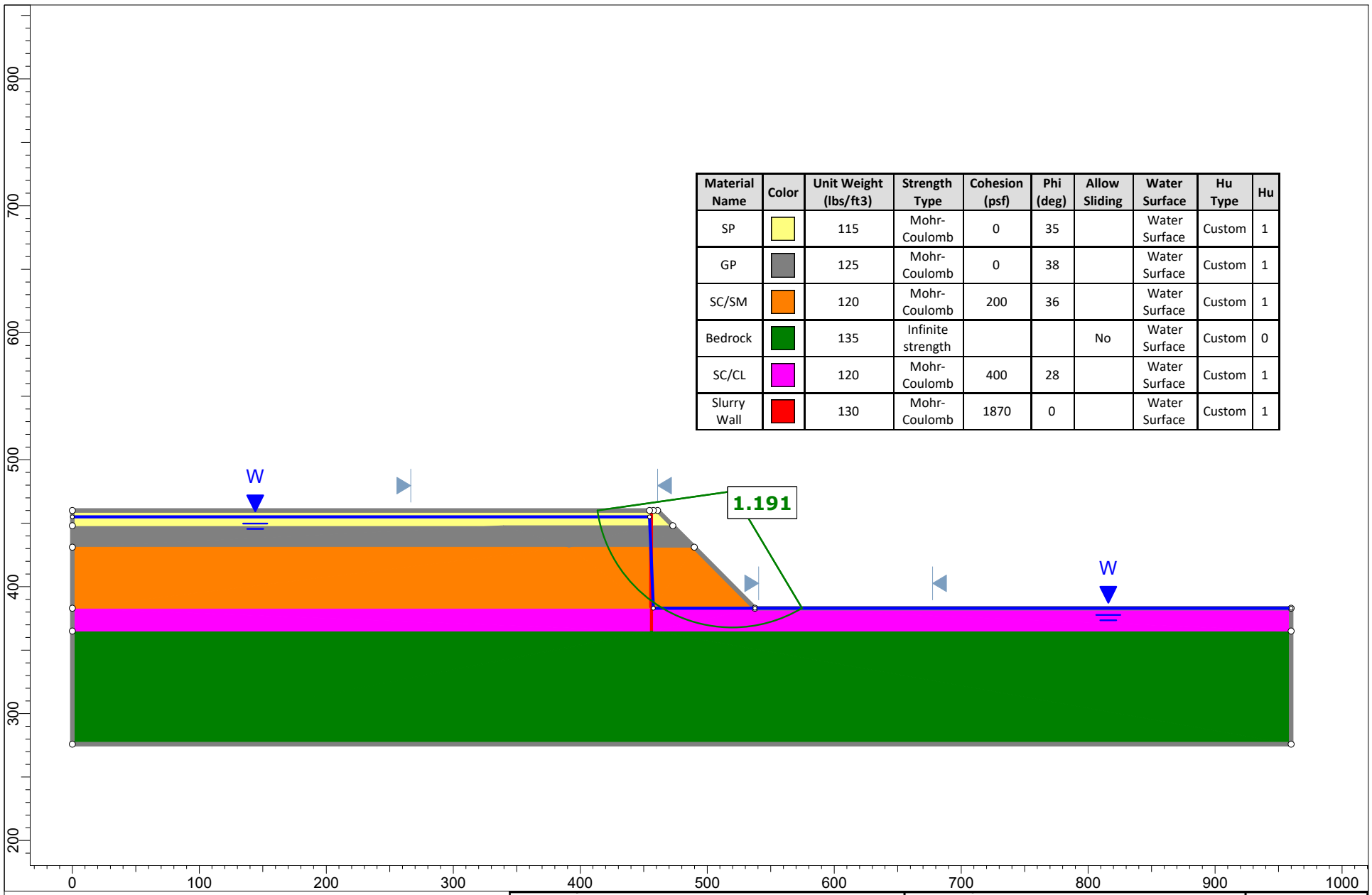
Date Issued: 9/20/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: **C-1**

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1



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CLIENT **SESPE CONSULTING, INC.**

PROJECT **MCKAY POINT RESERVOIR PROJECT**

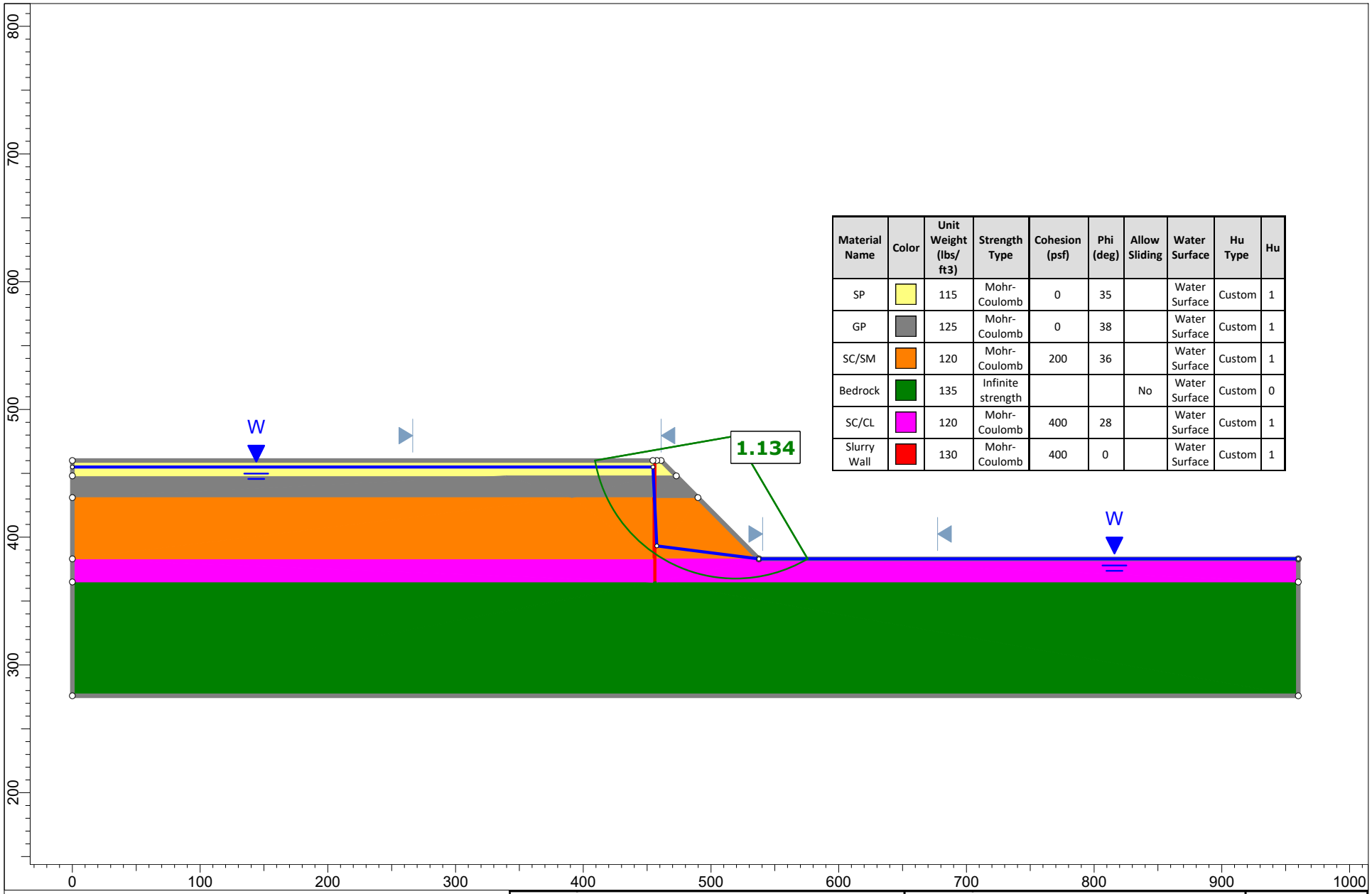
TITLE **TEMPORARY 1:1 SLOPE FULLY DEWATERED MODERATE STRENGTH SLURRY WALL**

Date Issued 9/20/2021

PROJECT NUMBER 117.02125.00002

DRAWING No. **C-2**

REV A



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

REPORT - - - -

CLIENT **SESPE CONSULTING, INC.**

Date Issued 9/20/2021

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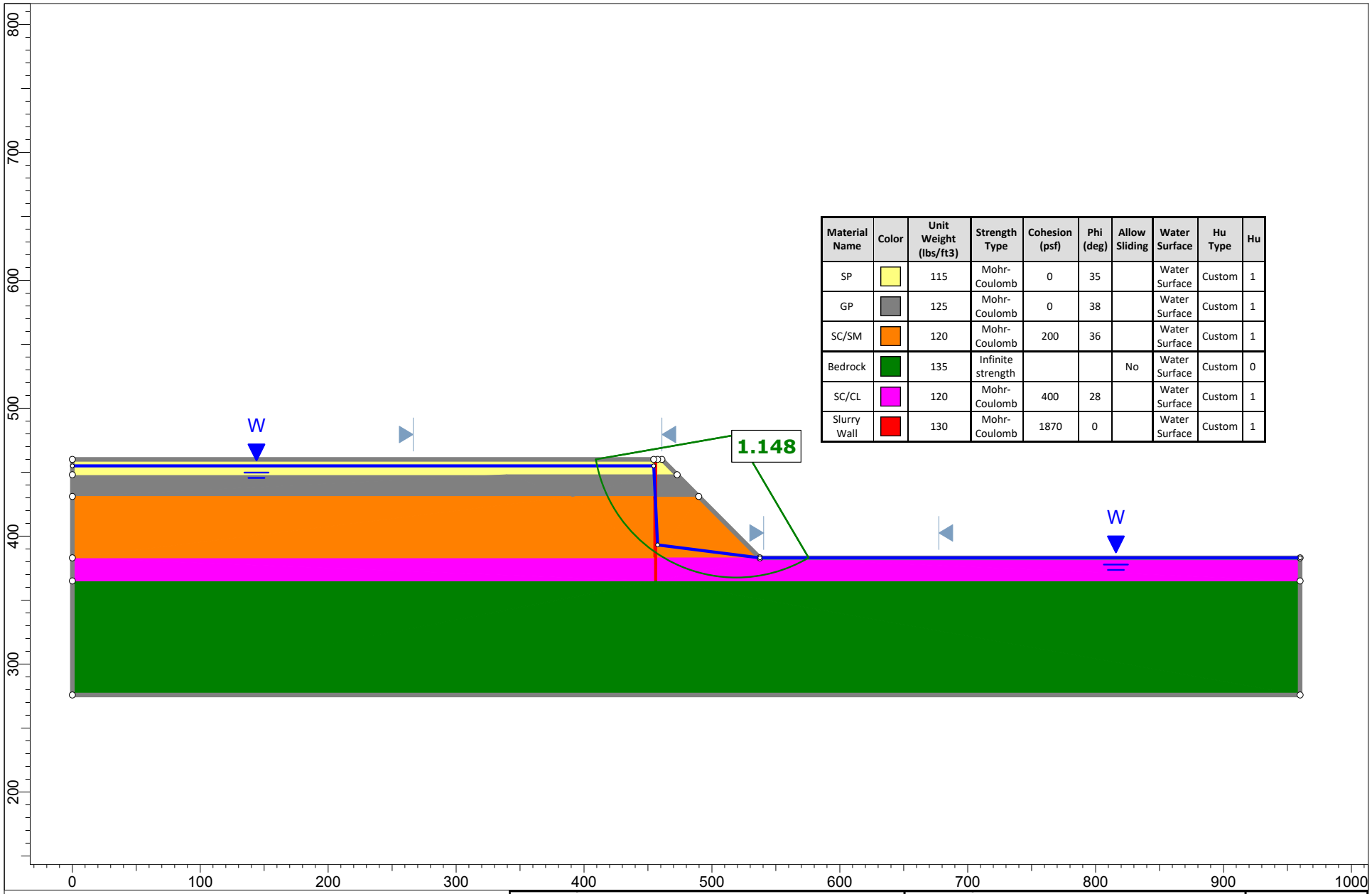
PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1:1 SLOPE PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-3**

REV **A**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

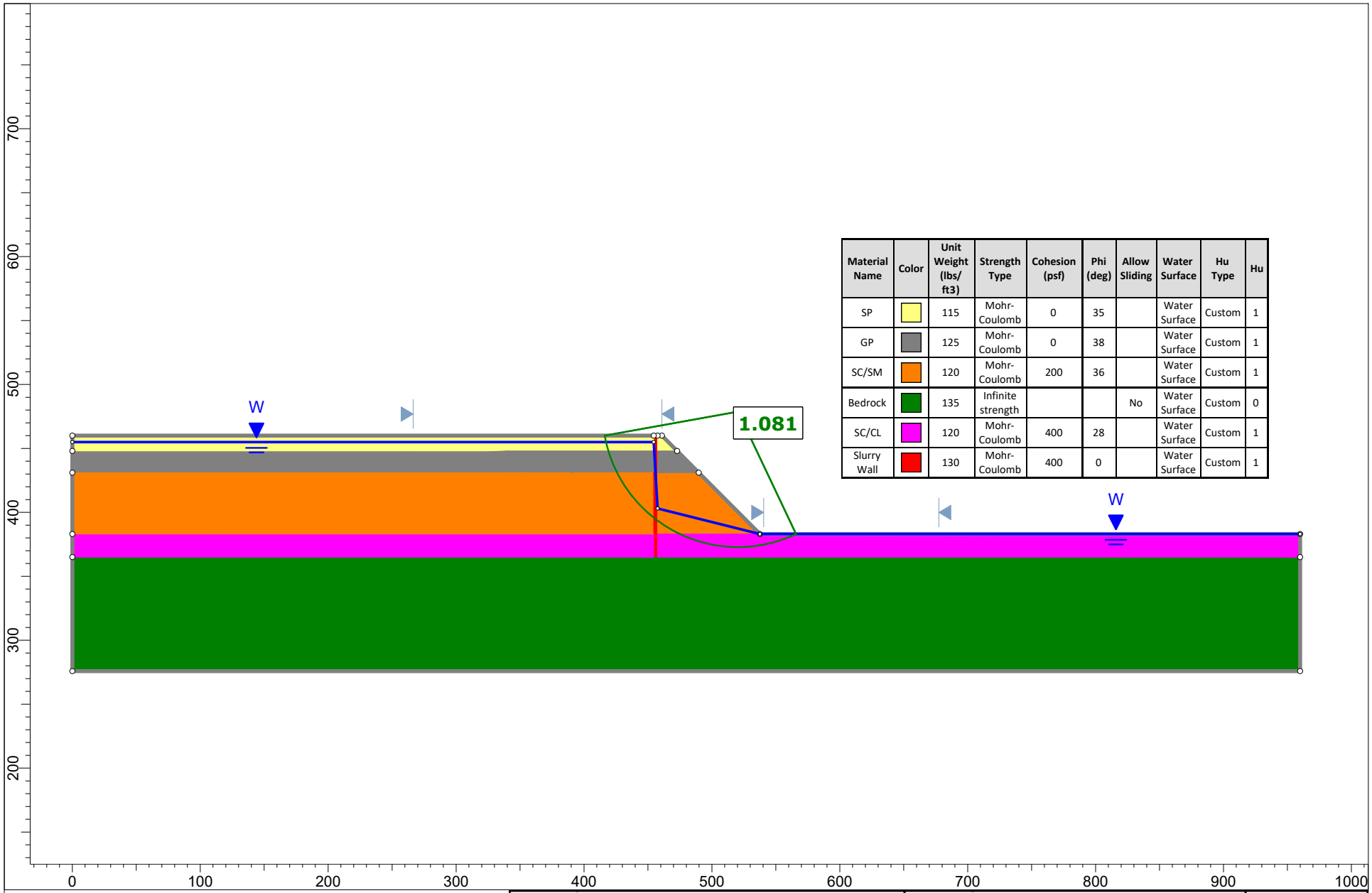
TITLE: TEMPORARY 1:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

Date Issued: 9/20/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-4

REV: A



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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CLIENT **SESPE CONSULTING, INC.**

Date Issued 9/20/2021

PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

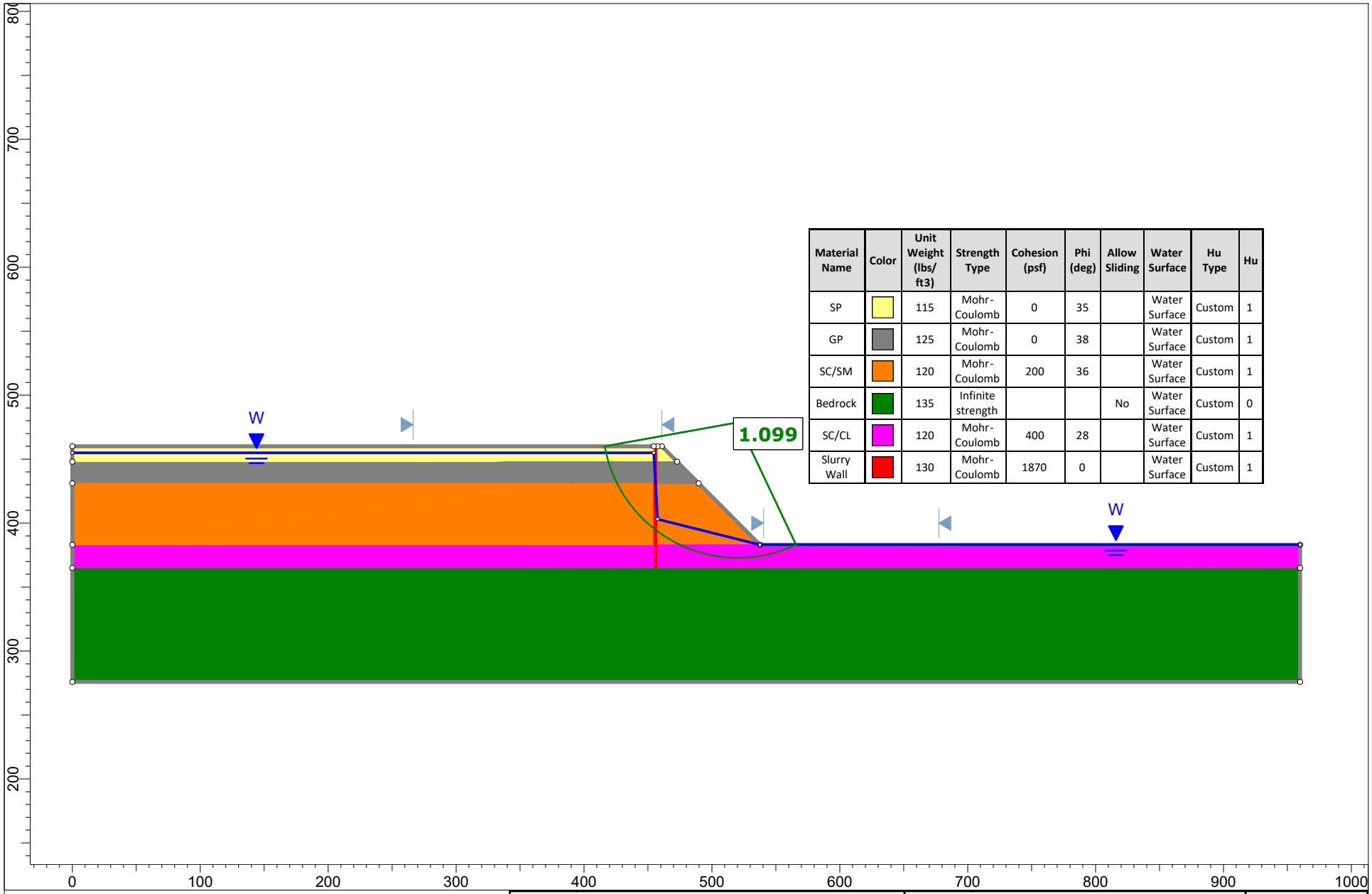
TITLE **TEMPORARY 1:1 SLOPE**
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

DRAWING No. **C-5**

REV **A**

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Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

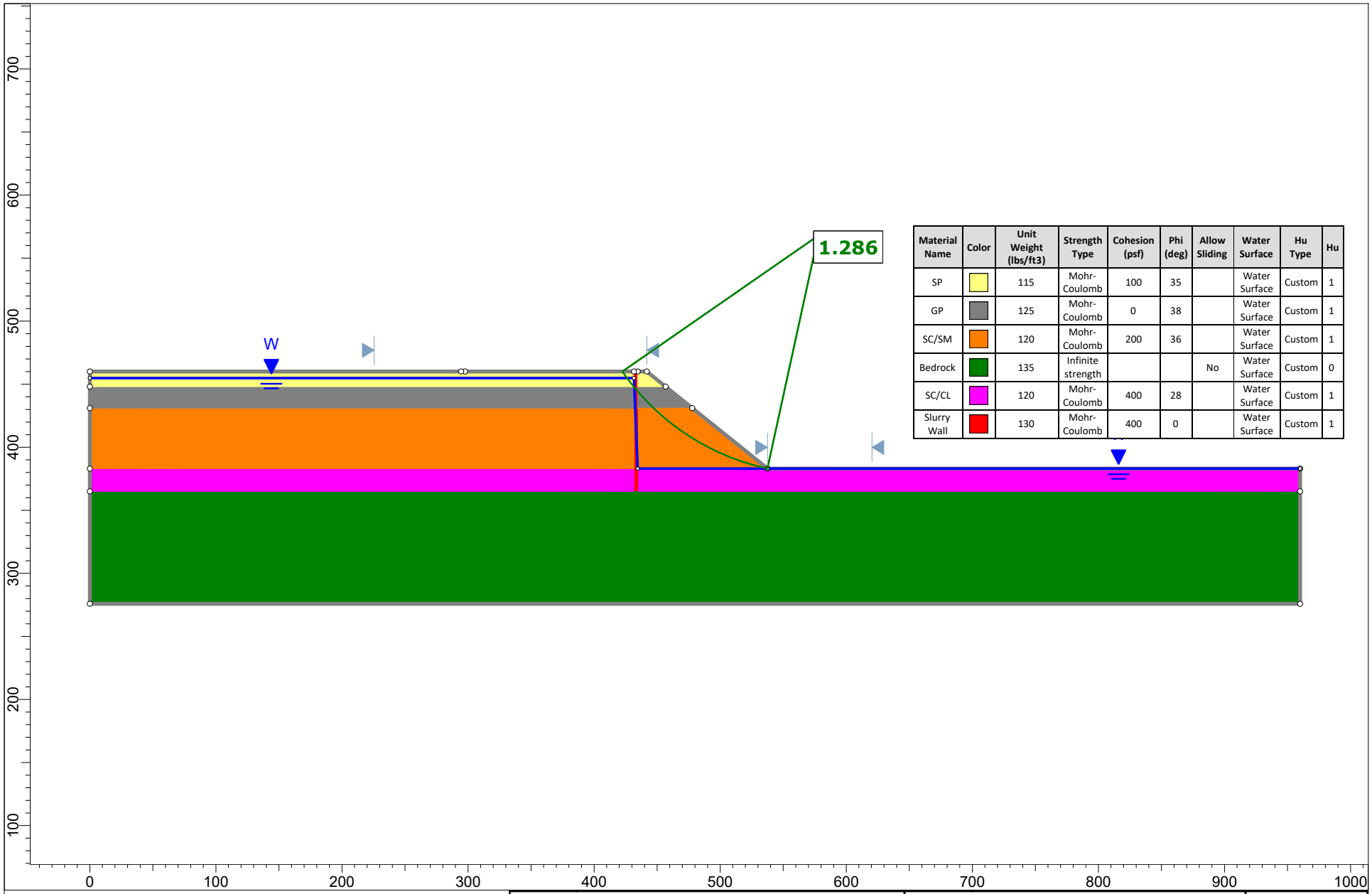
TITLE **TEMPORARY 1:1 SLOPE PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM MODERATE STRENGTH SLURRY WALL**

DRAWING No. **C-6**

REV **A**

TEMPORARY

1.25H:1V



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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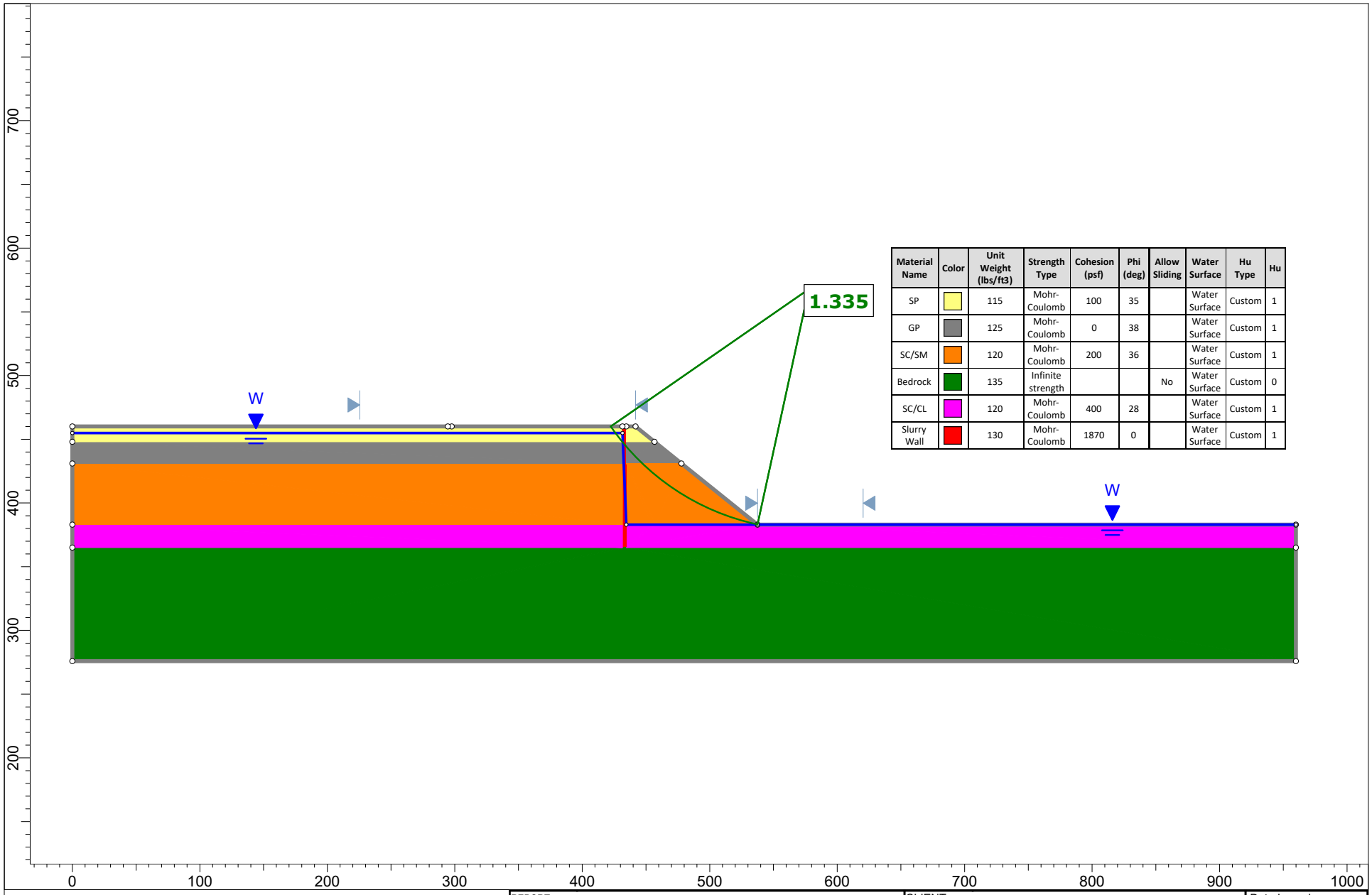
PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1.25:1 SLOPE FULLY DEWATERED LOW STRENGTH SLURRY WALL**

DRAWING No. **C-7**

REV **A**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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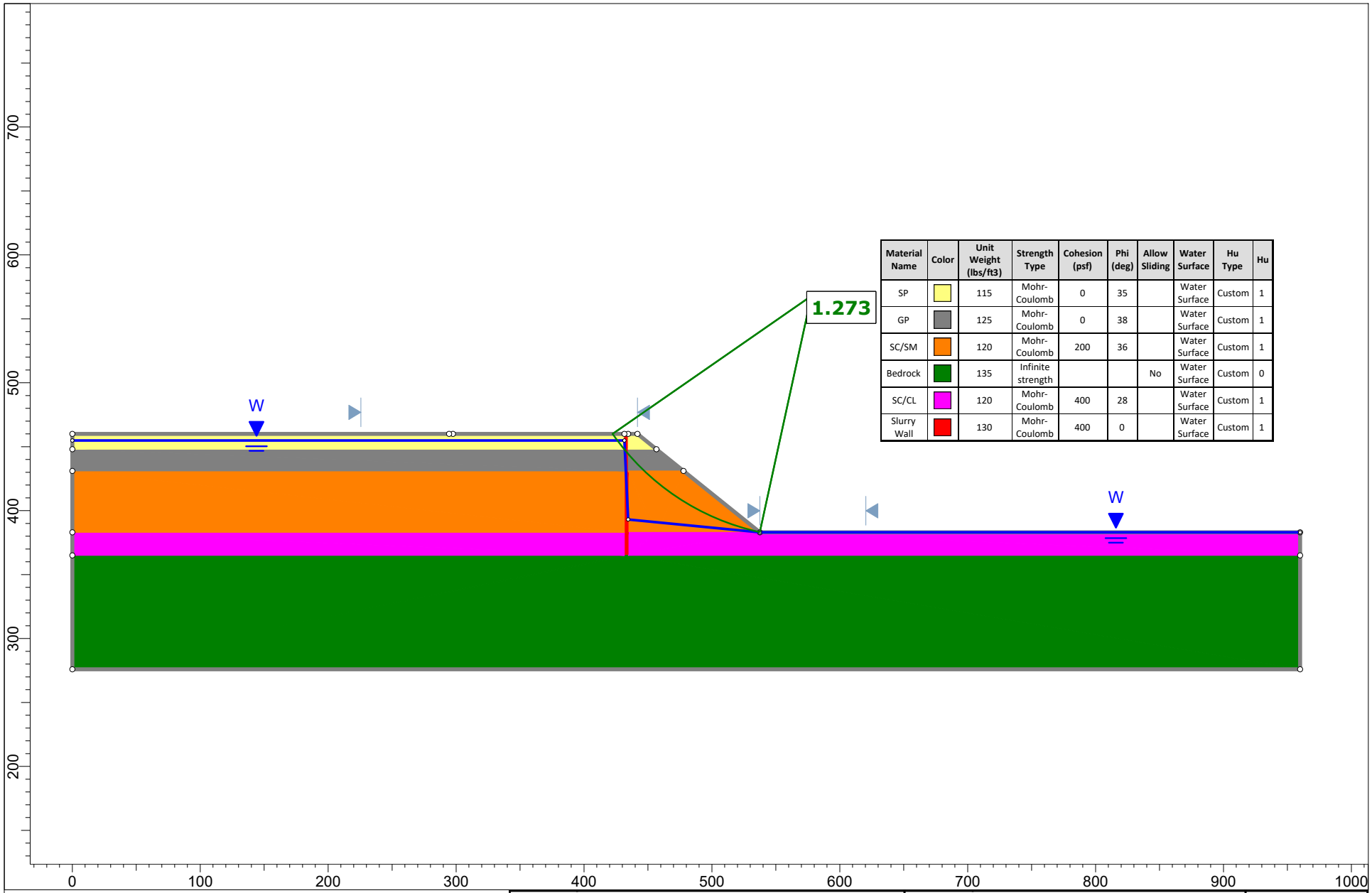
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
FULLY DEWATERED
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-8

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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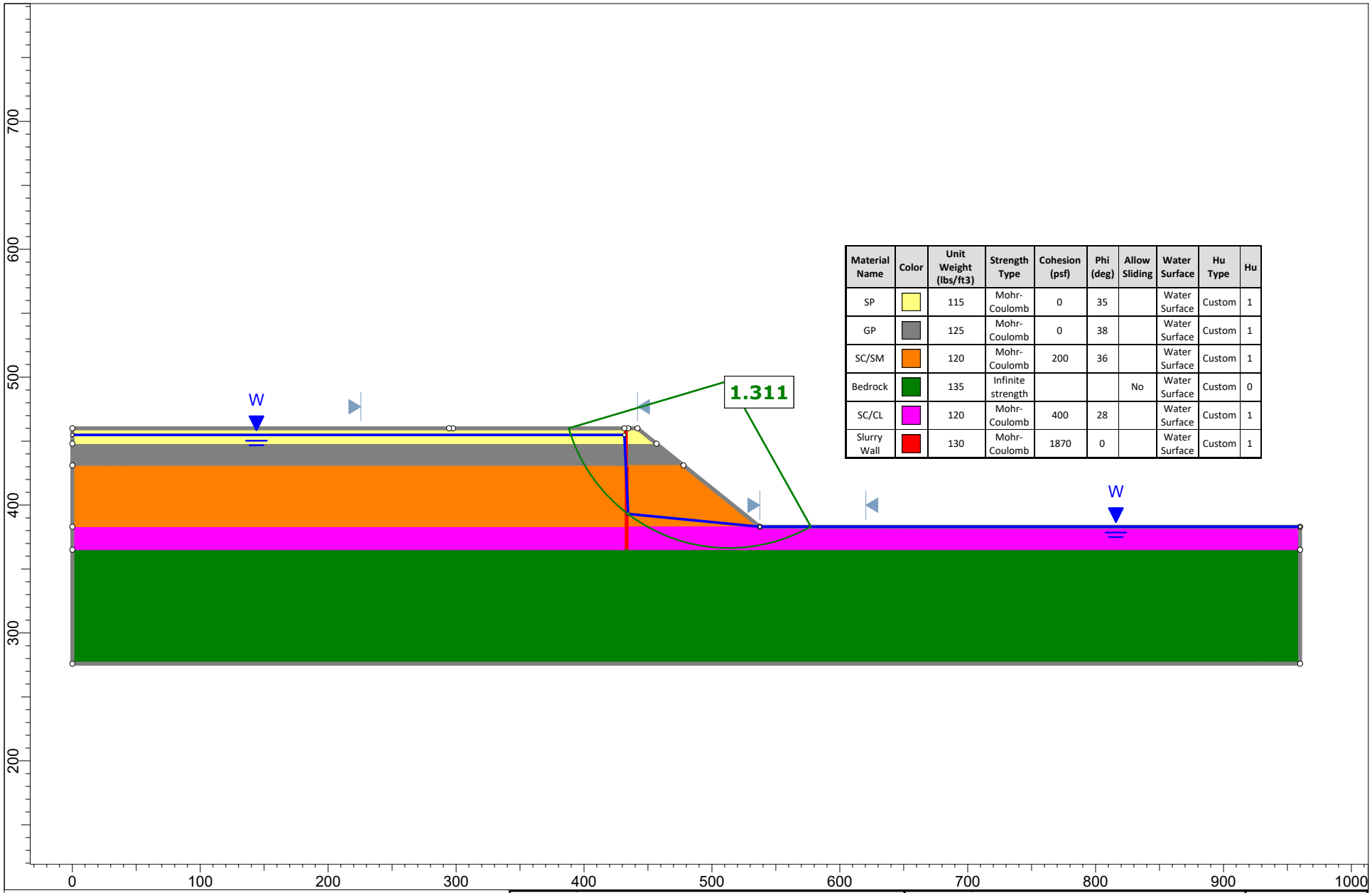
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

DRAWING No. C-9

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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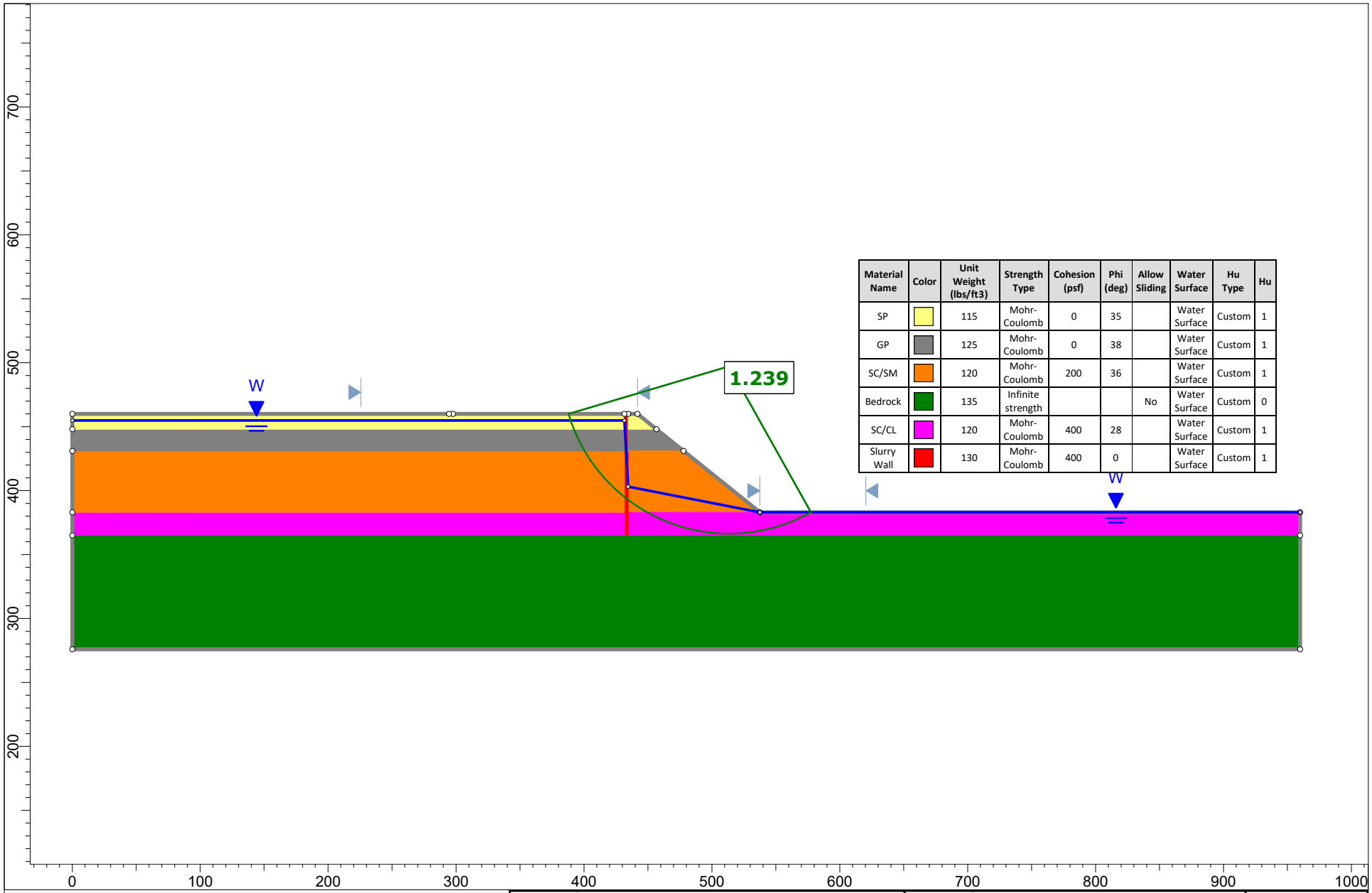
PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-10

REV A

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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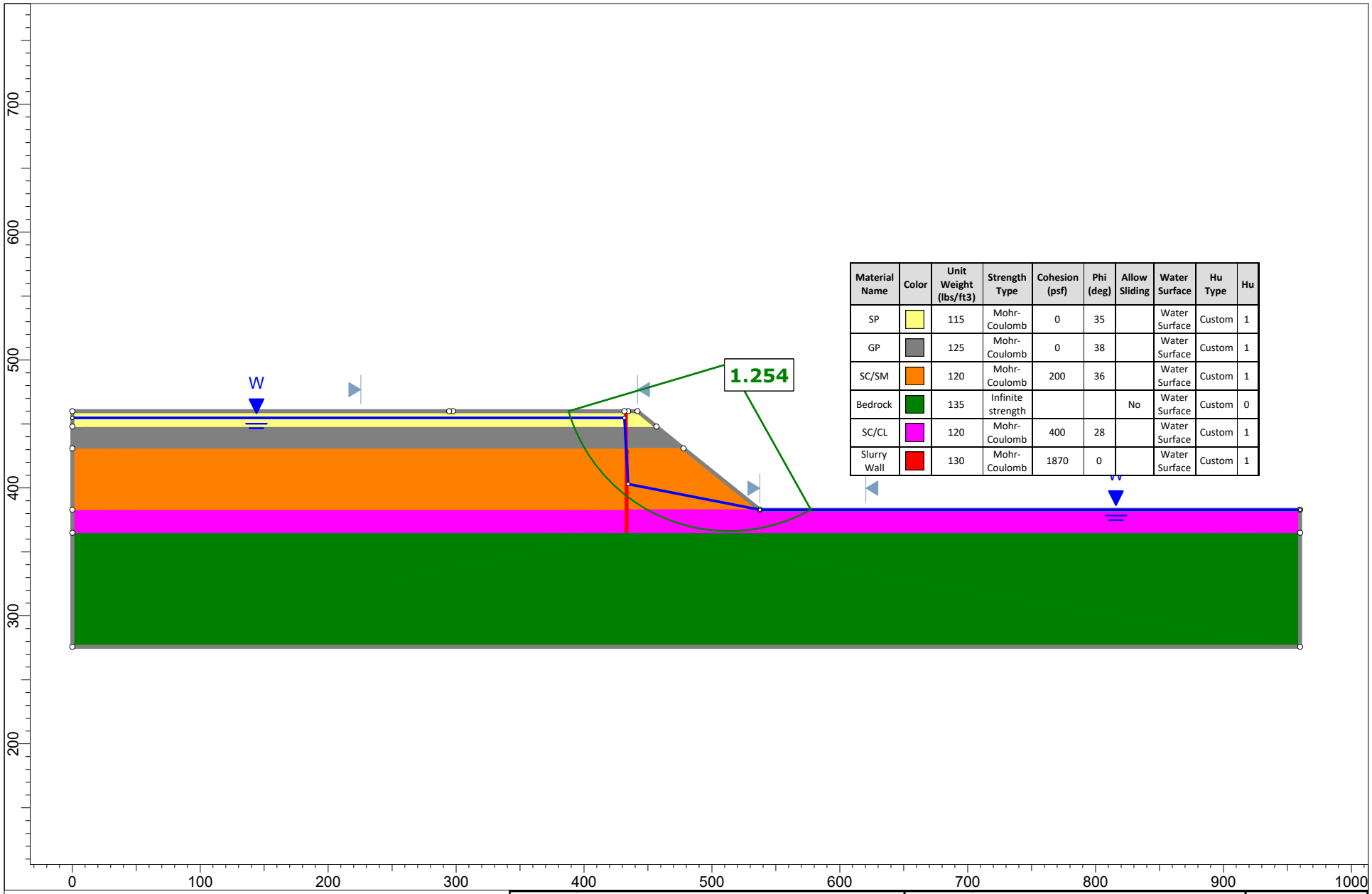
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
LOW STRENGTH SLURRY WALL

DRAWING No. C-11

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36		Water Surface	Custom	1
Bedrock		135	Infinite strength			No	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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PROJECT MCKAY POINT RESERVOIR PROJECT

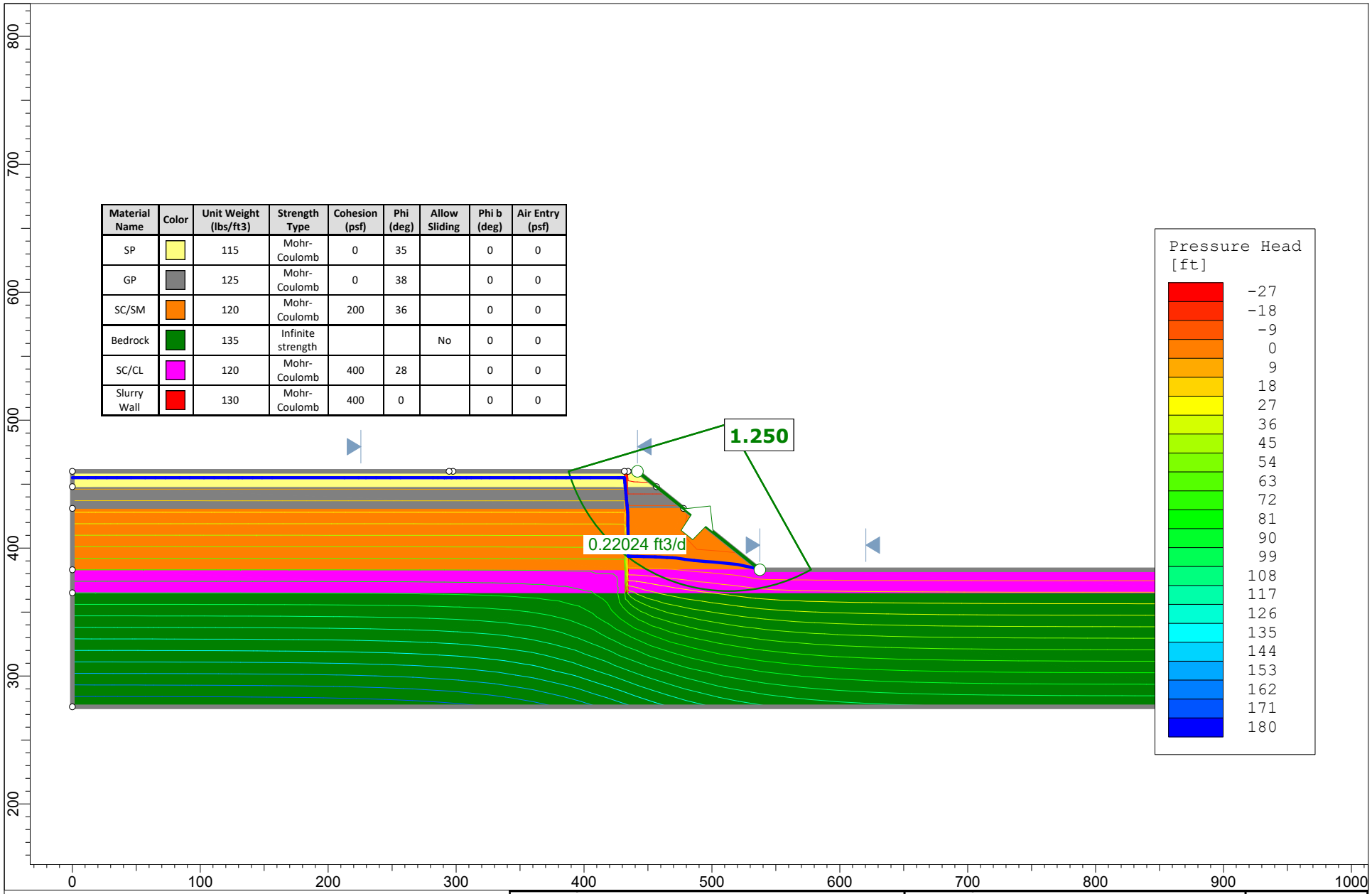
PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.25:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-12

REV A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35		0	0
GP		125	Mohr-Coulomb	0	38		0	0
SC/SM		120	Mohr-Coulomb	200	36		0	0
Bedrock		135	Infinite strength			No	0	0
SC/CL		120	Mohr-Coulomb	400	28		0	0
Slurry Wall		130	Mohr-Coulomb	400	0		0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: TEMPORARY 1.25:1 SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

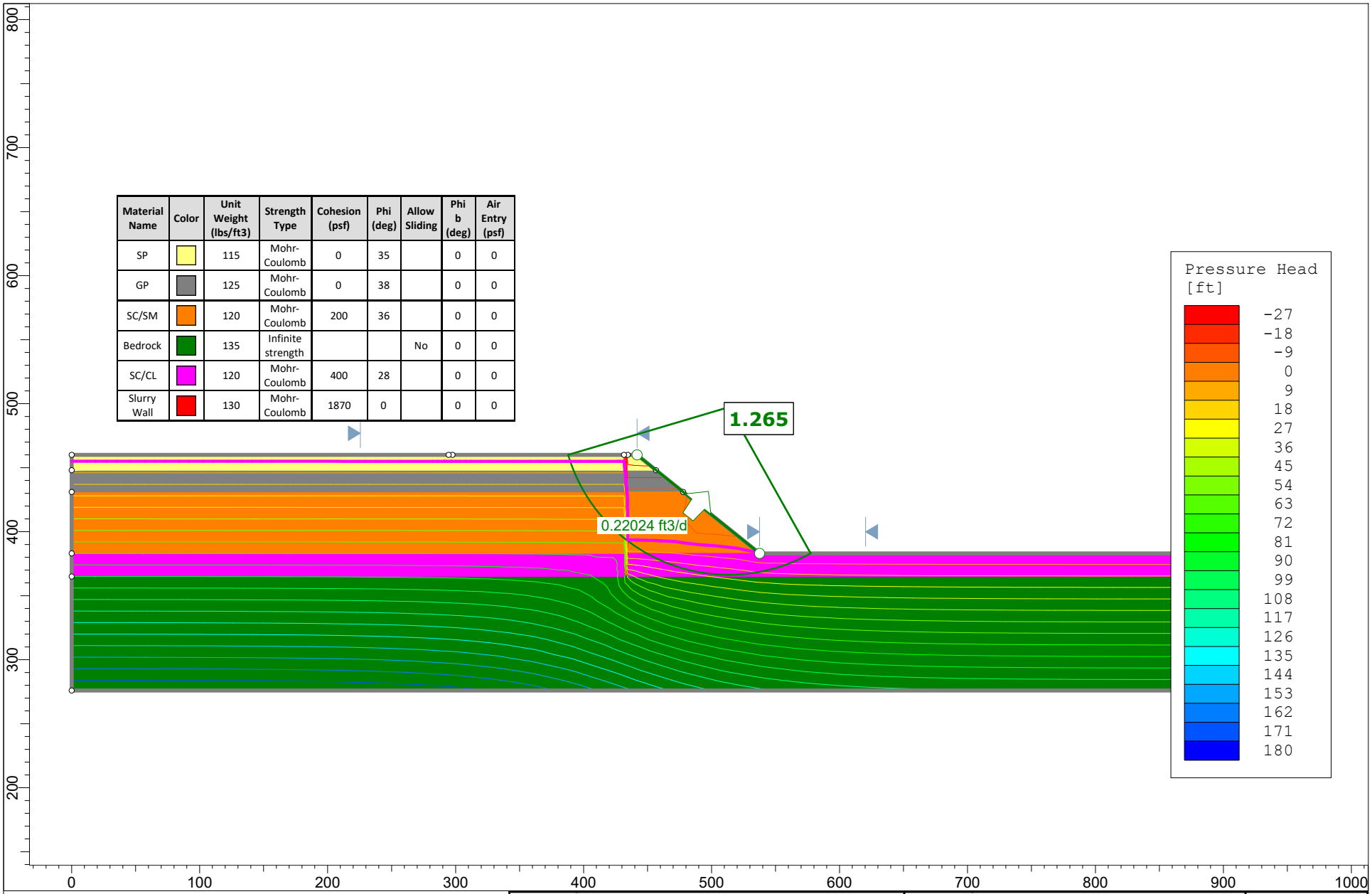
Date Issued: 9/20/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-13

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35		0	0
GP		125	Mohr-Coulomb	0	38		0	0
SC/SM		120	Mohr-Coulomb	200	36		0	0
Bedrock		135	Infinite strength			No	0	0
SC/CL		120	Mohr-Coulomb	400	28		0	0
Slurry Wall		130	Mohr-Coulomb	1870	0		0	0

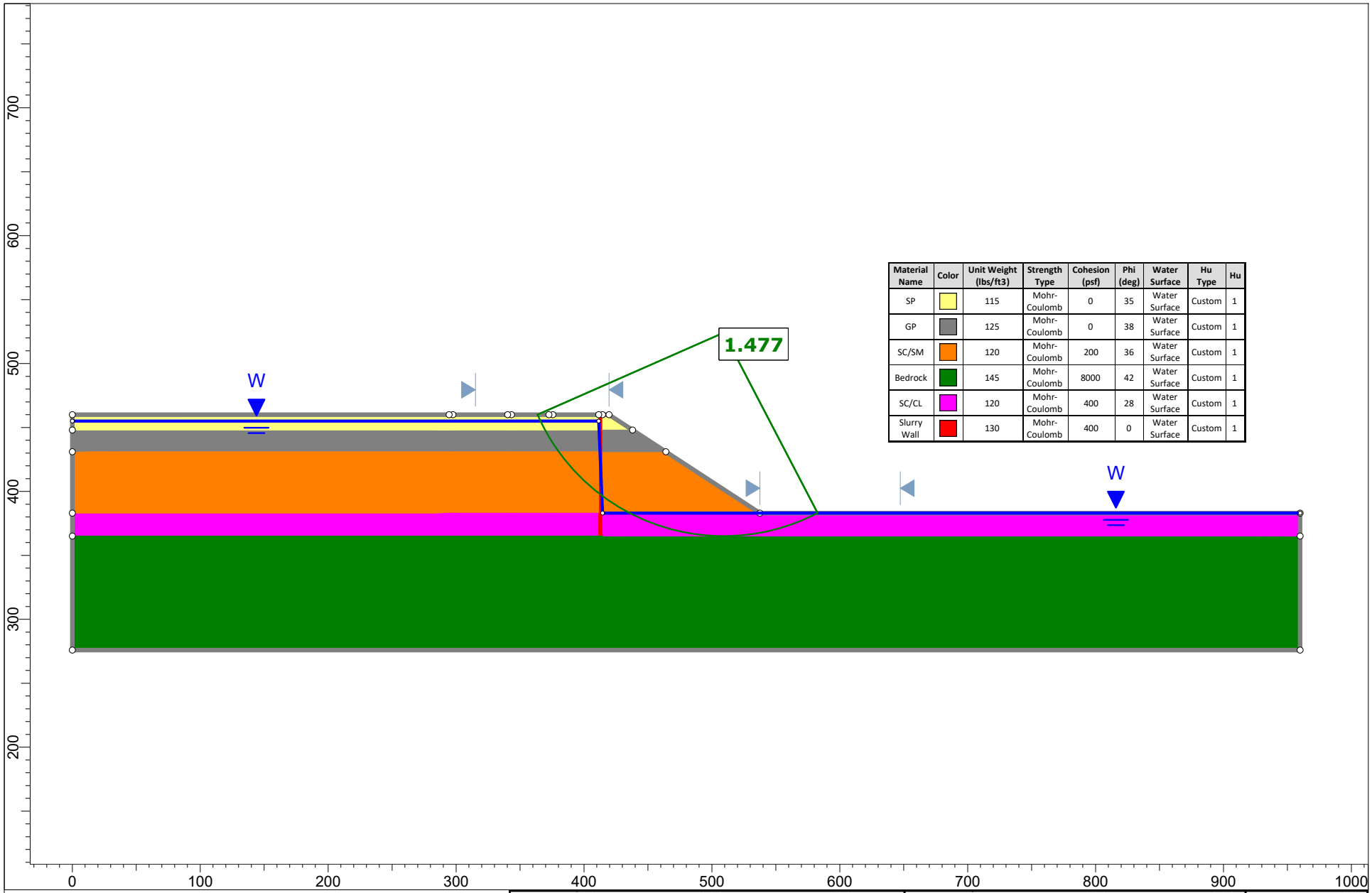


REPORT - - - -	CLIENT SESPE CONSULTING, INC.		Date Issued 9/20/2021
PROVIDED BY SLR INTERNATIONAL CORPORATION Consulting Engineers & Scientists 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT MCKAY POINT RESERVOIR PROJECT		PROJECT NUMBER 117.02125.00002
	TITLE TEMPORARY 1.25:1 SLOPE DEWATERED STEADY STATE CONDITIONS MODERATE STRENGTH SLURRY WALL	DRAWING No. C-14	REV A

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TEMPORARY

1.5H:1V



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1

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CLIENT **SESPE CONSULTING, INC.**

PROJECT **MCKAY POINT RESERVOIR PROJECT**

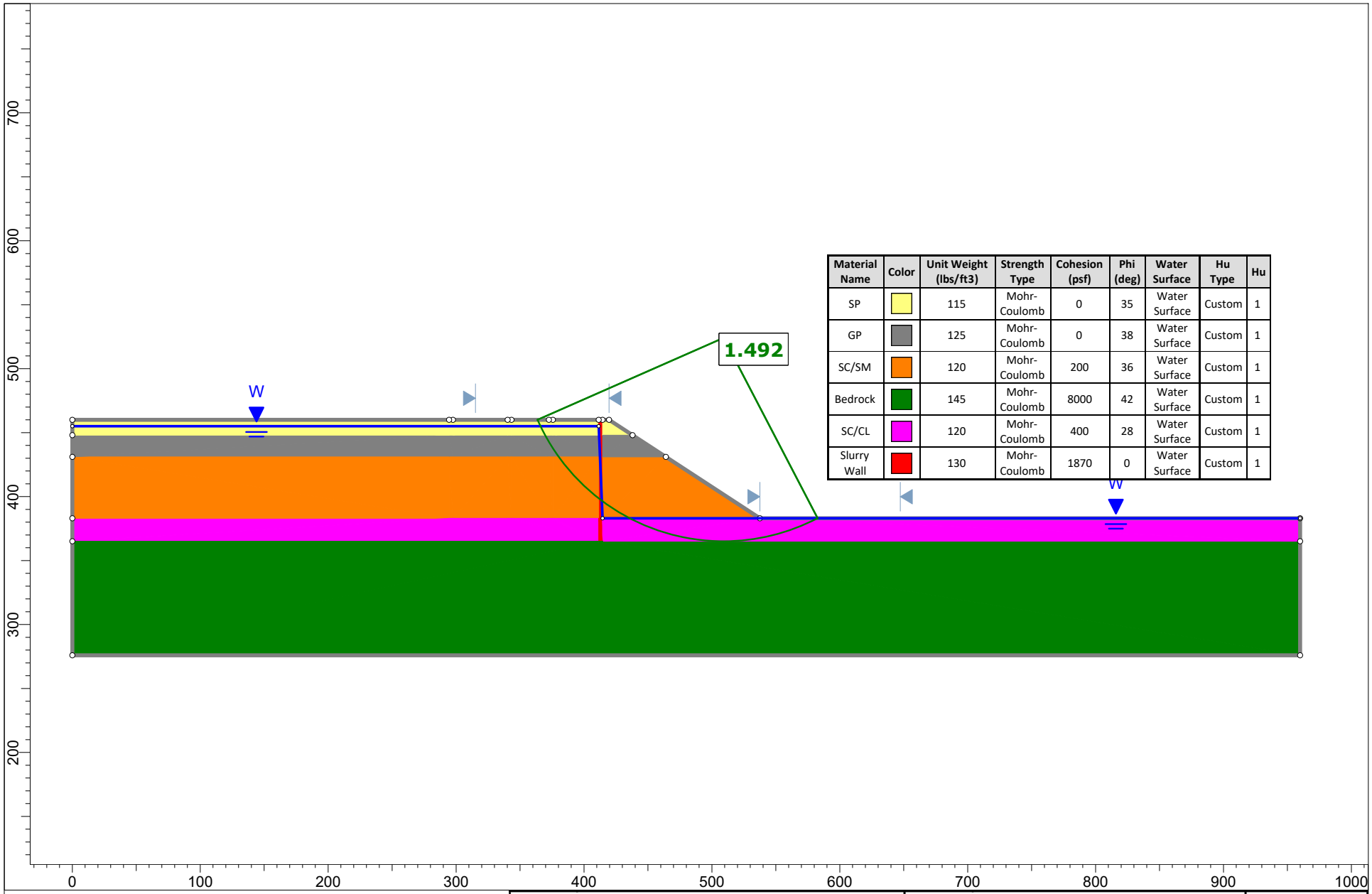
TITLE **TEMPORARY 1.5:1 SLOPE**
FULLY DEWATERED
LOW STRENGTH SLURRY WALL

Date Issued 10/1/2021

PROJECT NUMBER 117.02125.00002

DRAWING No. **C-15**

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1

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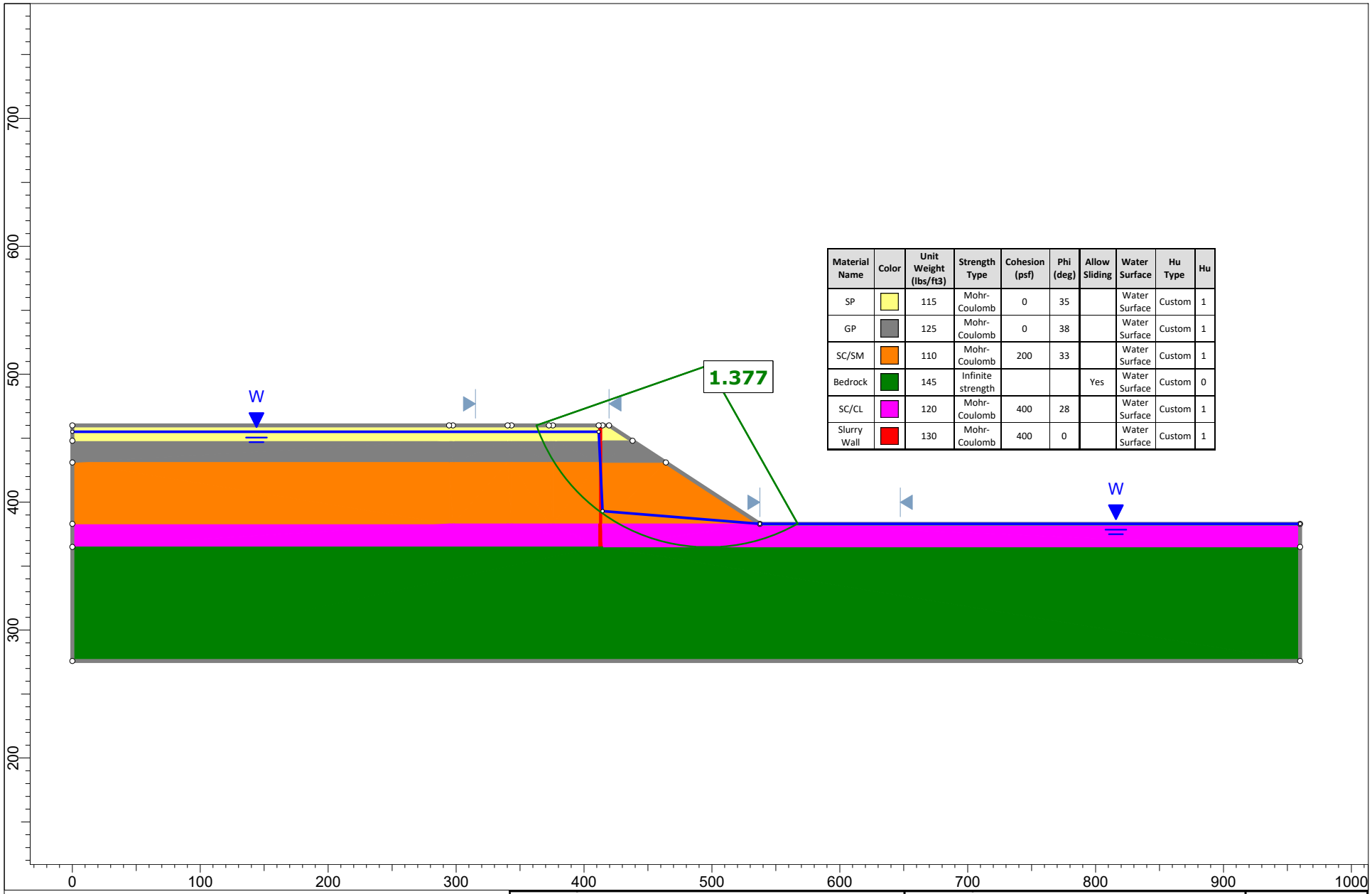
PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.5:1 SLOPE
FULLY DEWATERED
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-16

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		110	Mohr-Coulomb	200	33		Water Surface	Custom	1
Bedrock		145	Infinite strength			Yes	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0		Water Surface	Custom	1

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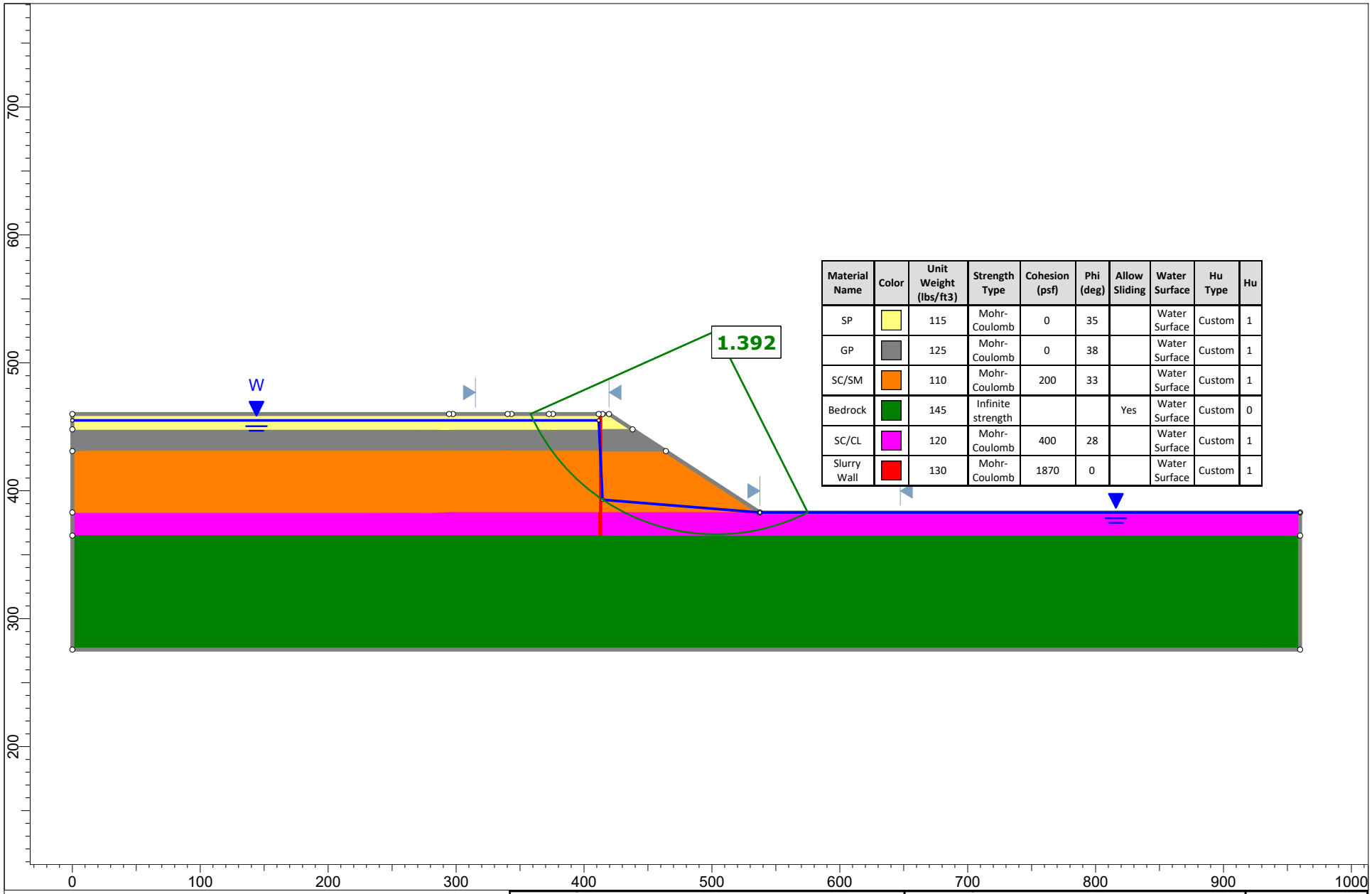
PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1.5:1 SLOPE PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-17**

REV **A**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Allow Sliding	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	0	35		Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38		Water Surface	Custom	1
SC/SM		110	Mohr-Coulomb	200	33		Water Surface	Custom	1
Bedrock		145	Infinite strength			Yes	Water Surface	Custom	0
SC/CL		120	Mohr-Coulomb	400	28		Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0		Water Surface	Custom	1

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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

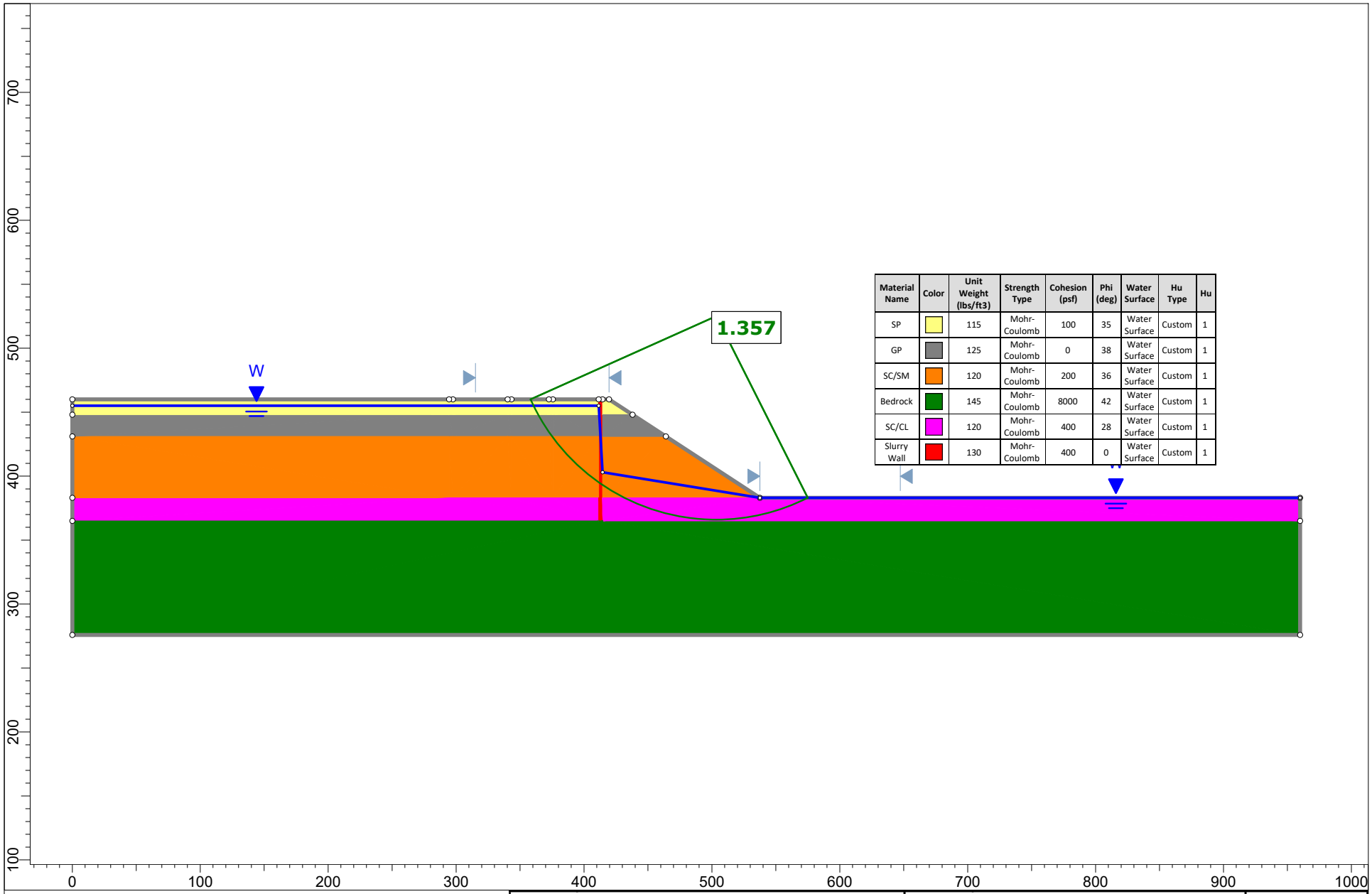
TITLE: TEMPORARY 1.5:1 SLOPE
PARTIALLY DEWATERED 10 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

Date Issued: 9/30/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-18

REV: A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1

REPORT - - - -

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Date Issued 10/1/2021

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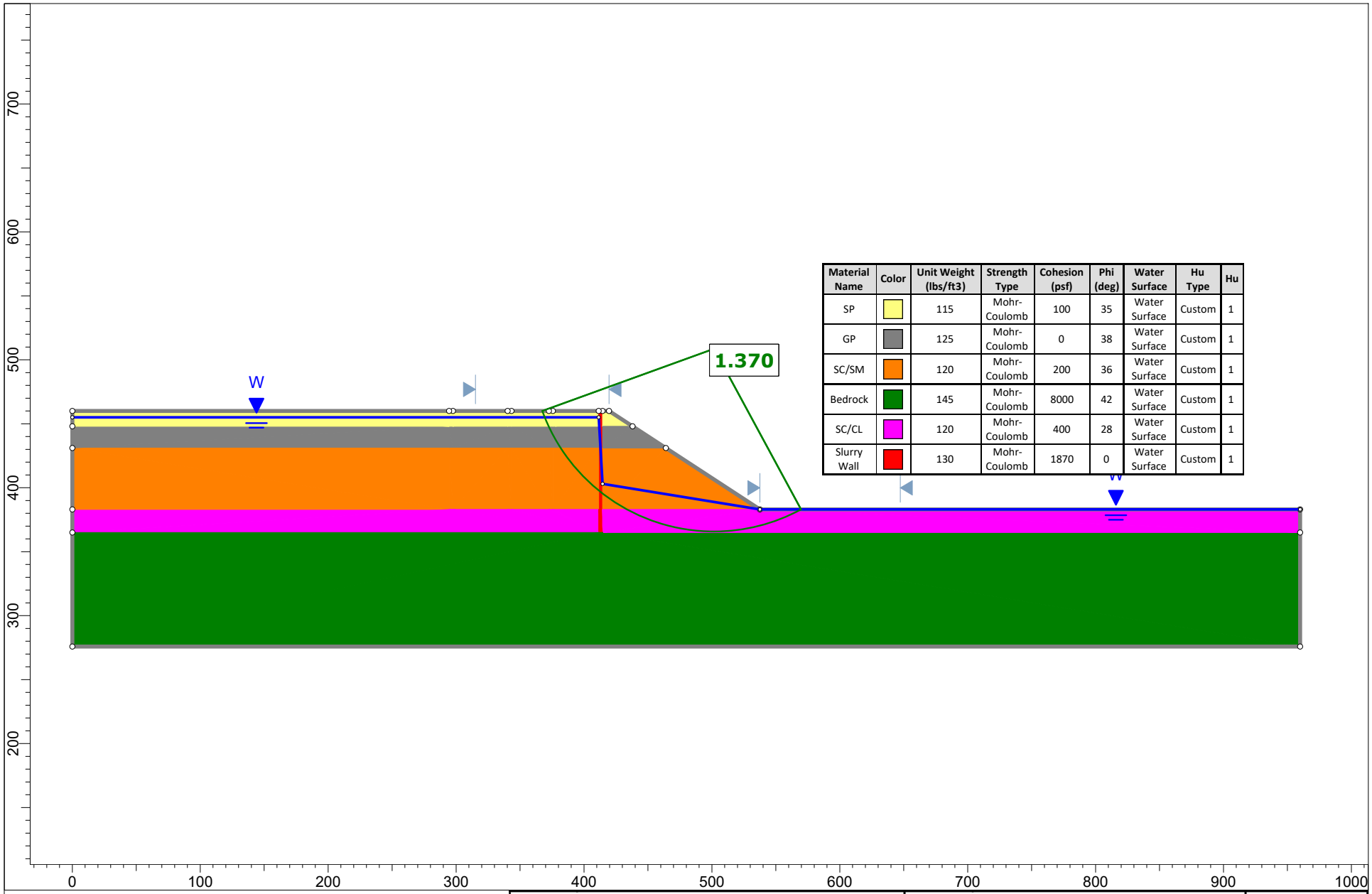
PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **TEMPORARY 1.5:1 SLOPE PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM LOW STRENGTH SLURRY WALL**

DRAWING No. **C-19**

REV **A**



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1

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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

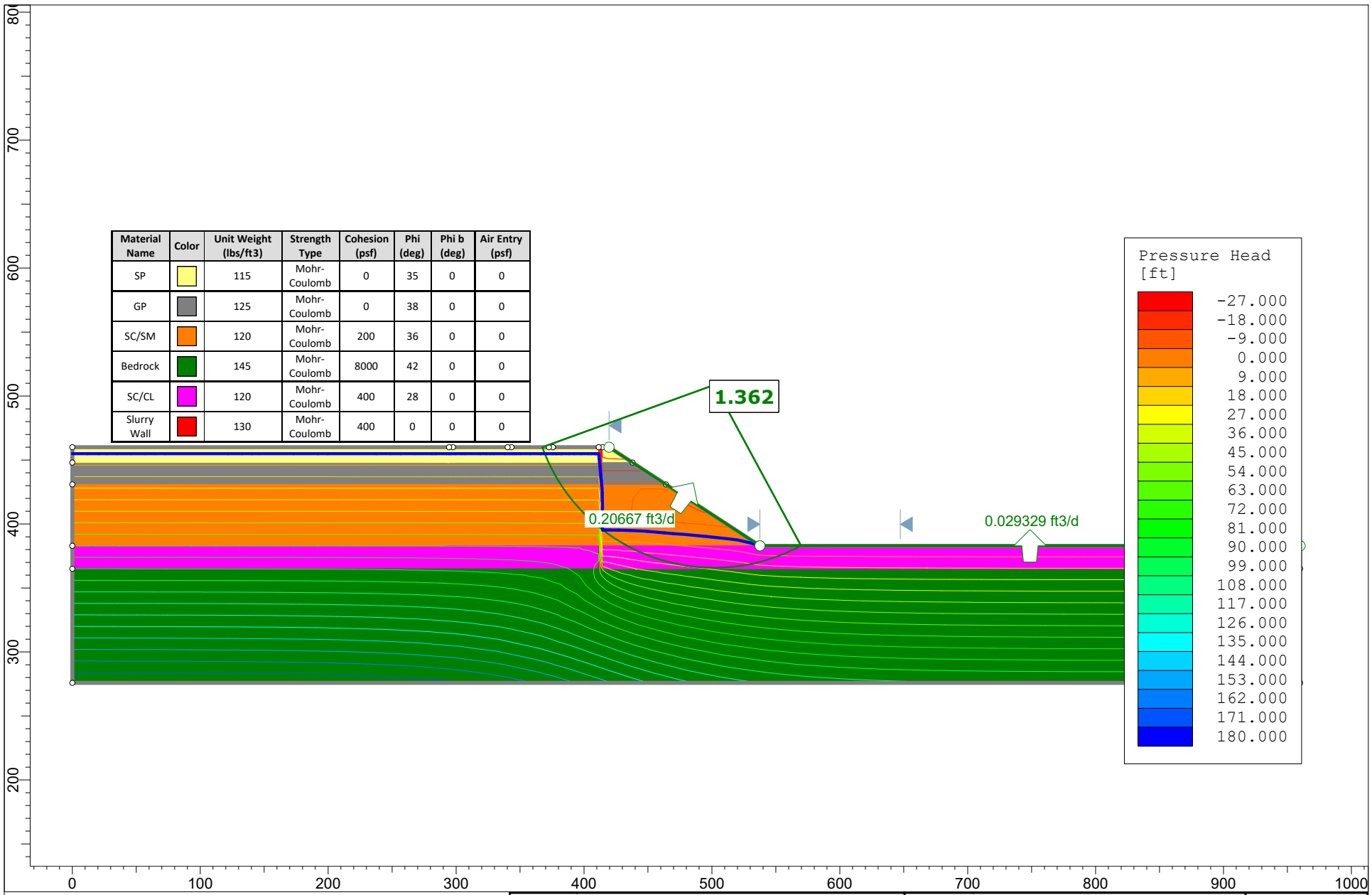
TITLE
TEMPORARY 1.5:1 SLOPE
PARTIALLY DEWATERED 20 FT ABOVE EX. BOTTOM
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-20

REV A

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Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

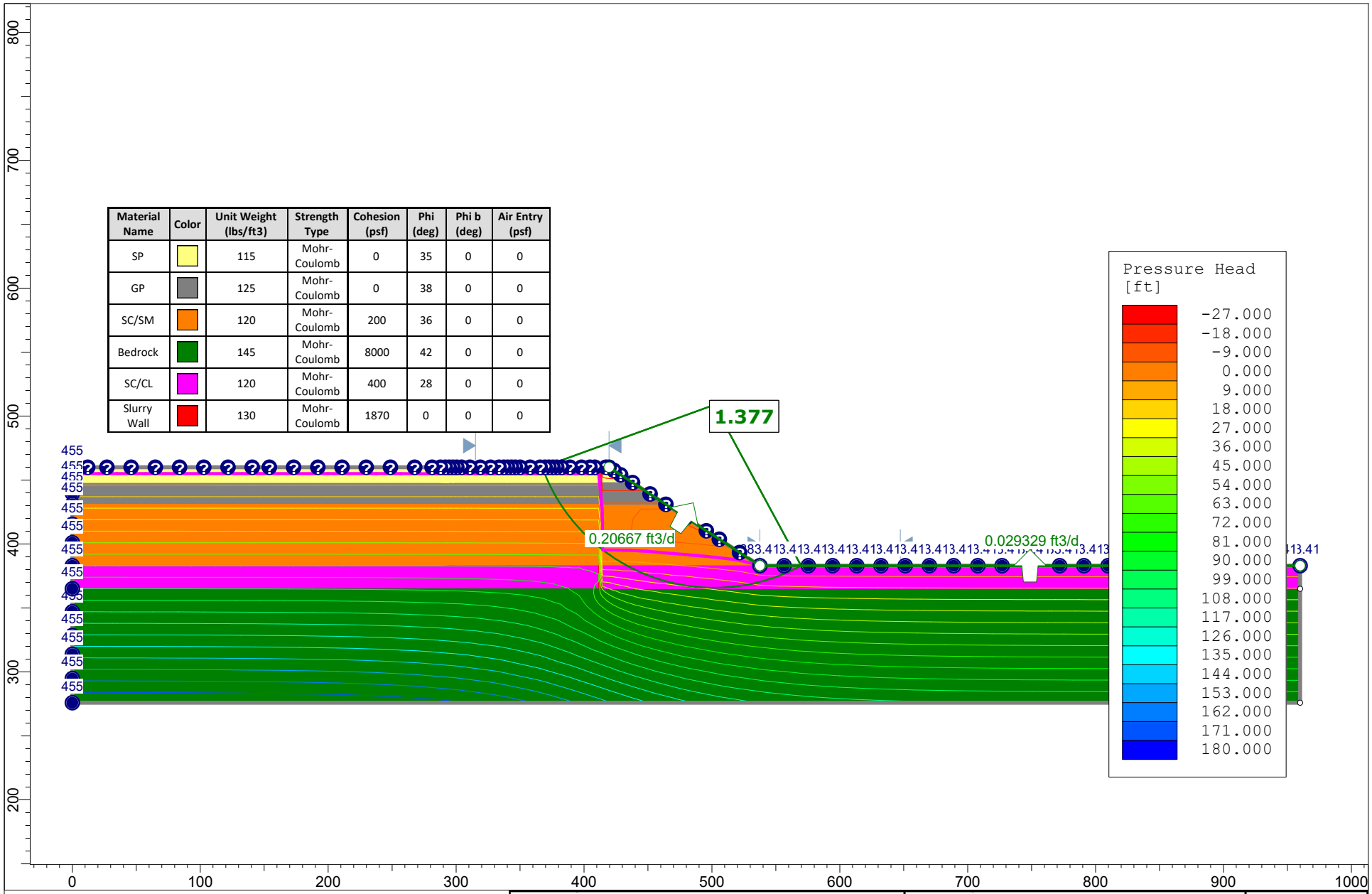
PROJECT NUMBER 117.02125.00002

TITLE
TEMPORARY 1.5:1 SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

DRAWING No. C-21

REV A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	0	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE TEMPORARY 1.5:1 SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-22

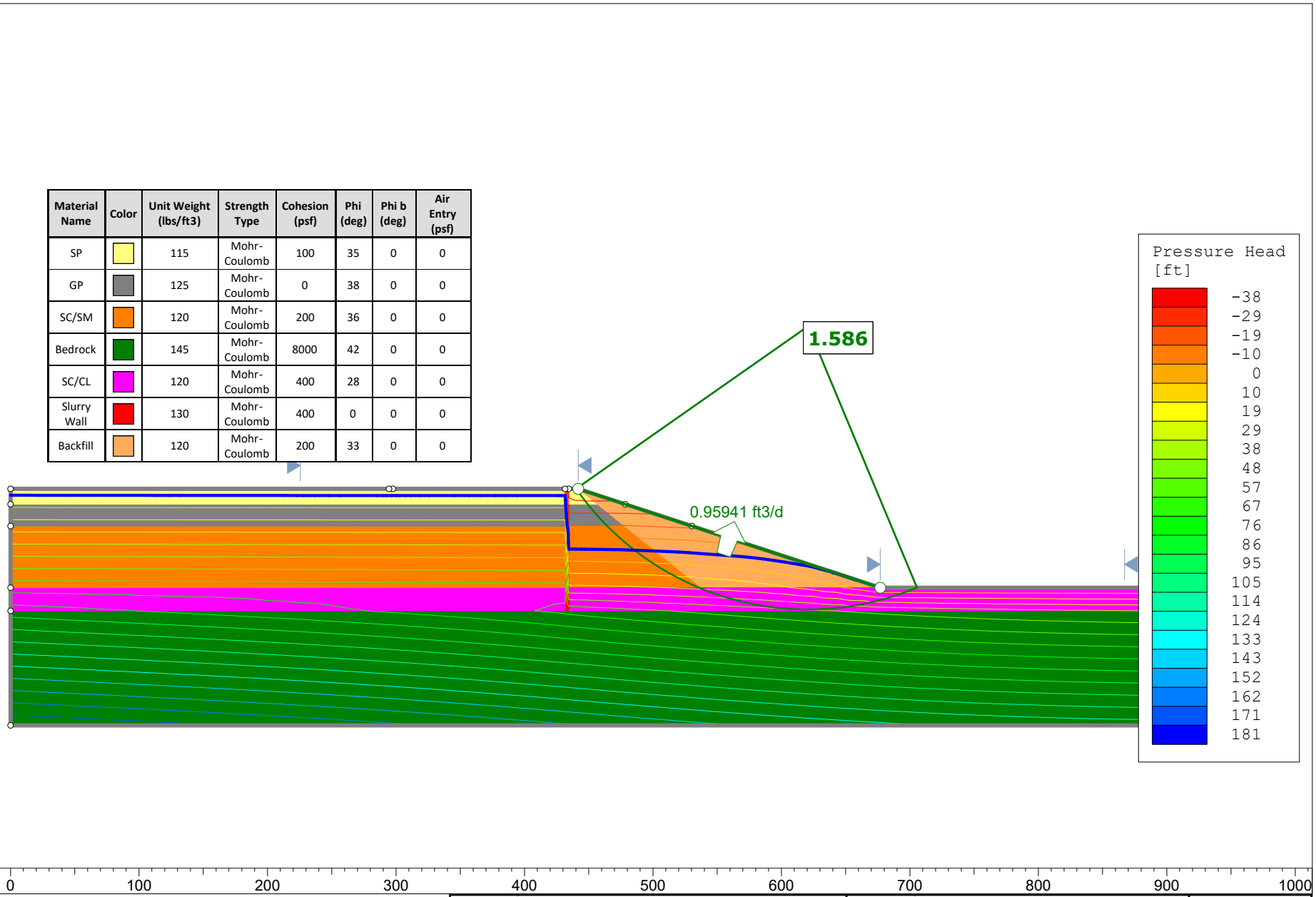
REV A

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PERMANENT

3H:1V

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.25:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

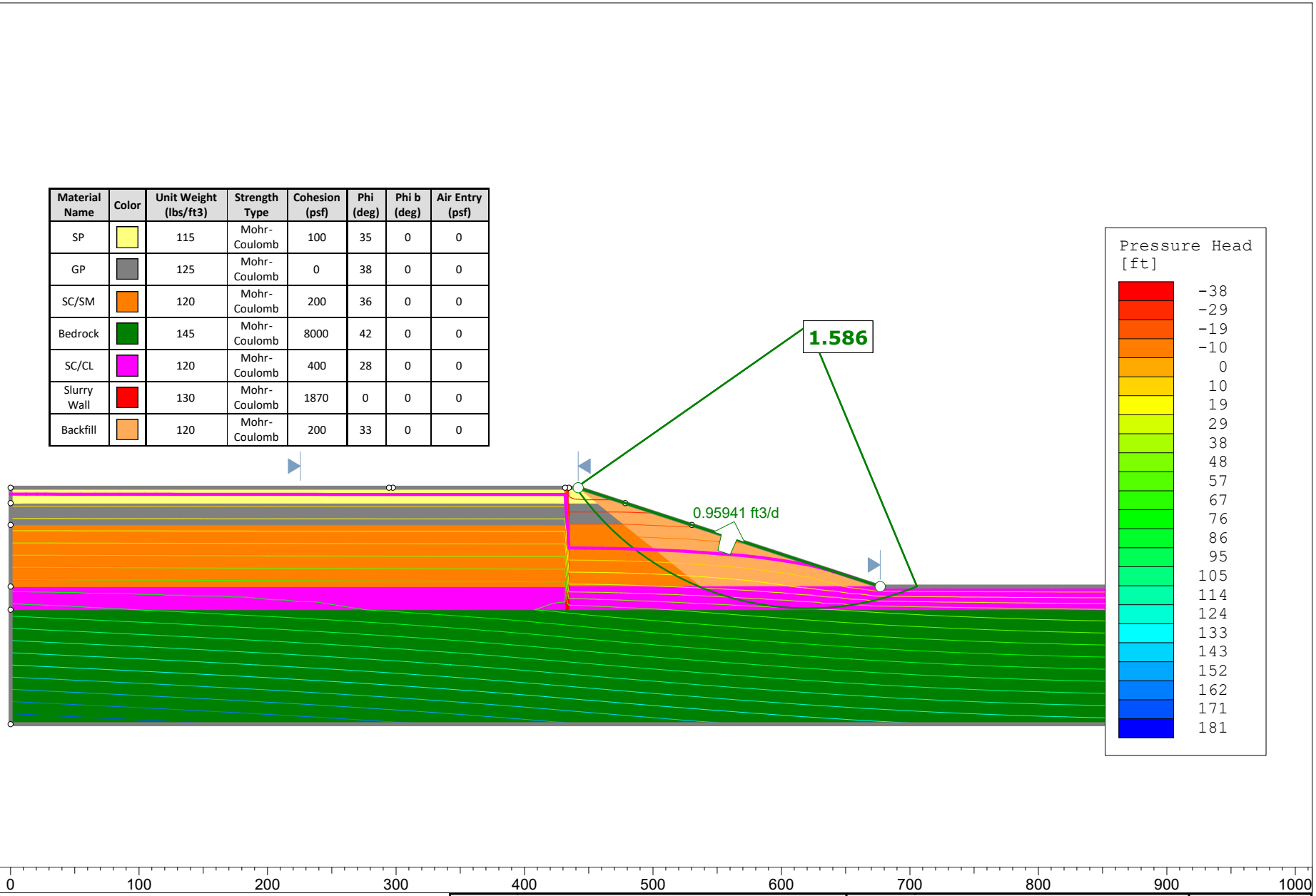
Date Issued: 9/20/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-23

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.25:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

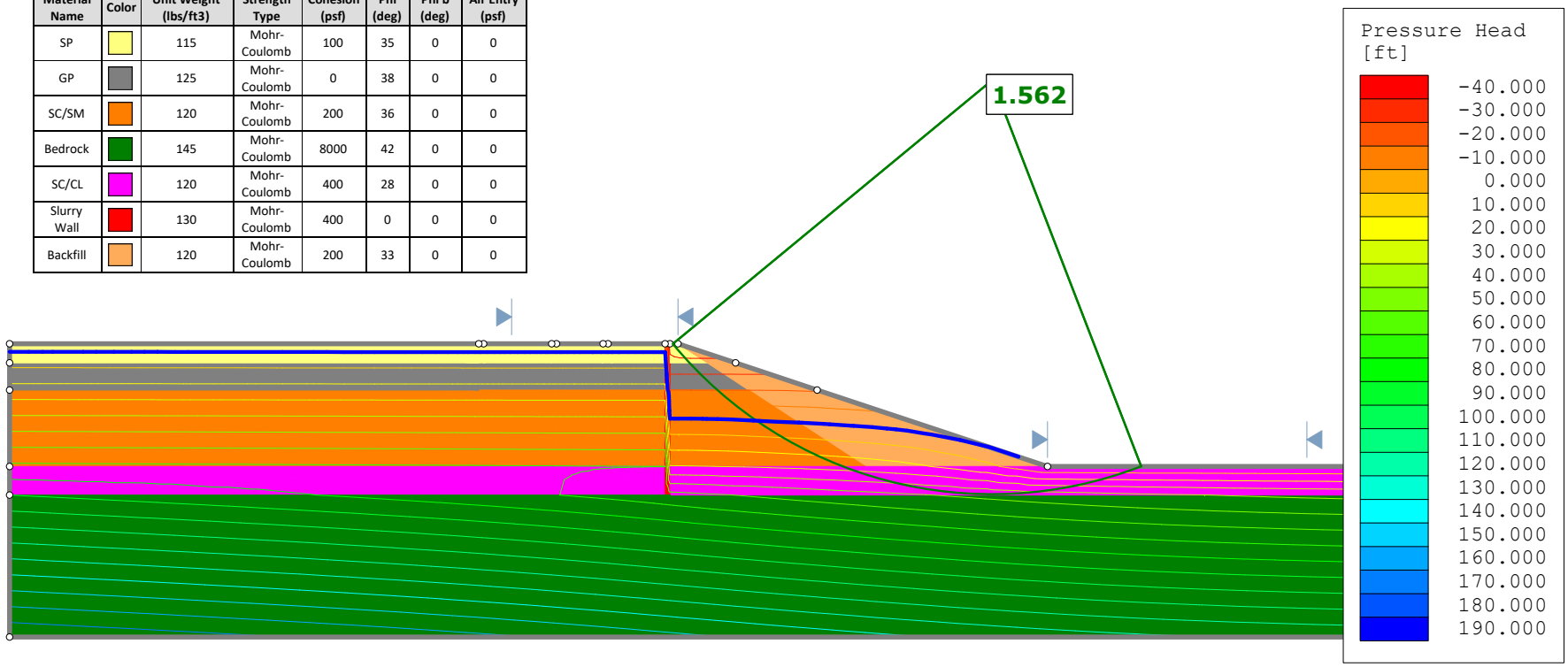
Date Issued: 9/20/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-24

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
LOW STRENGTH SLURRY WALL

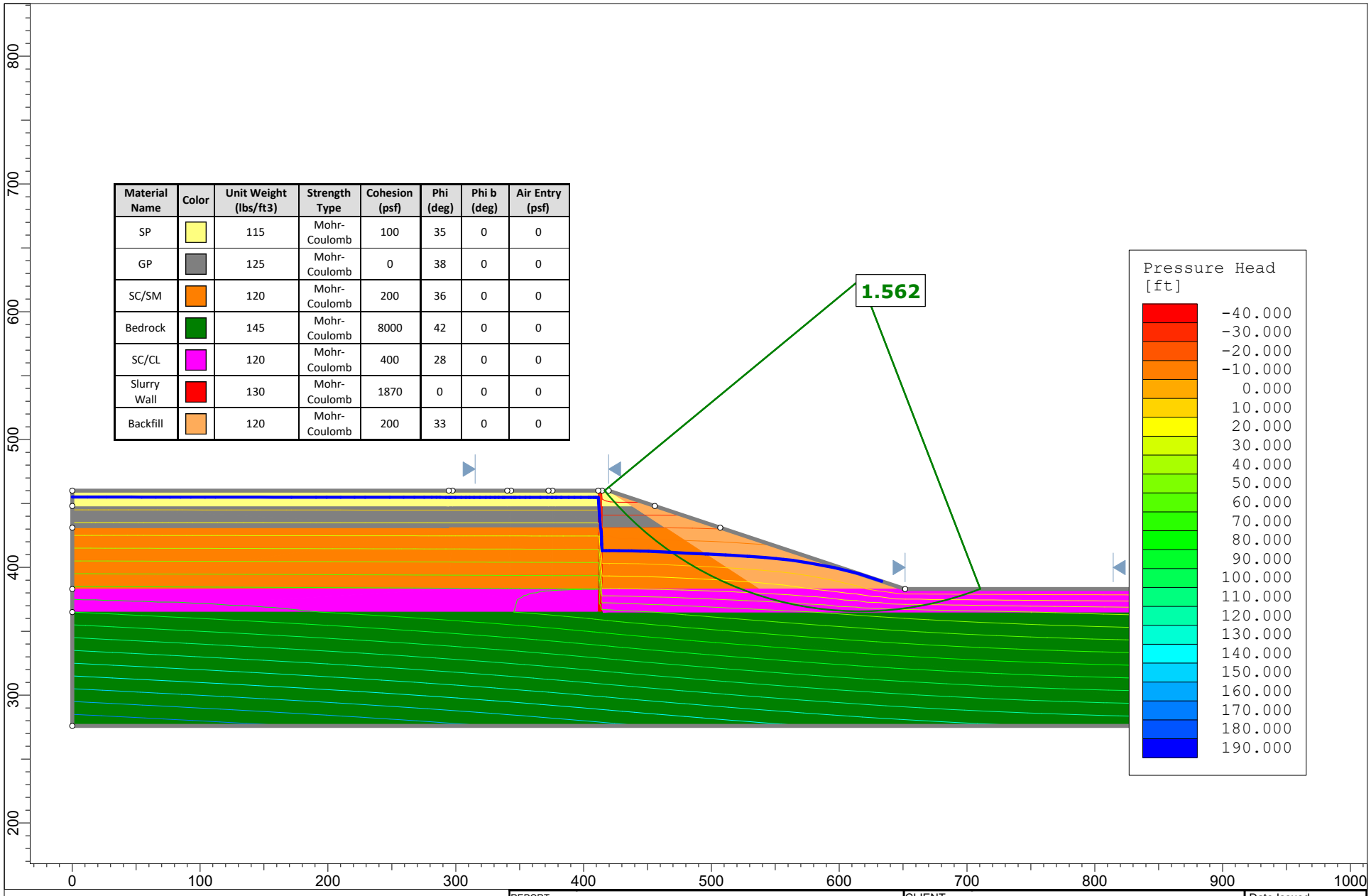
Date Issued: 10/1/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-25

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE

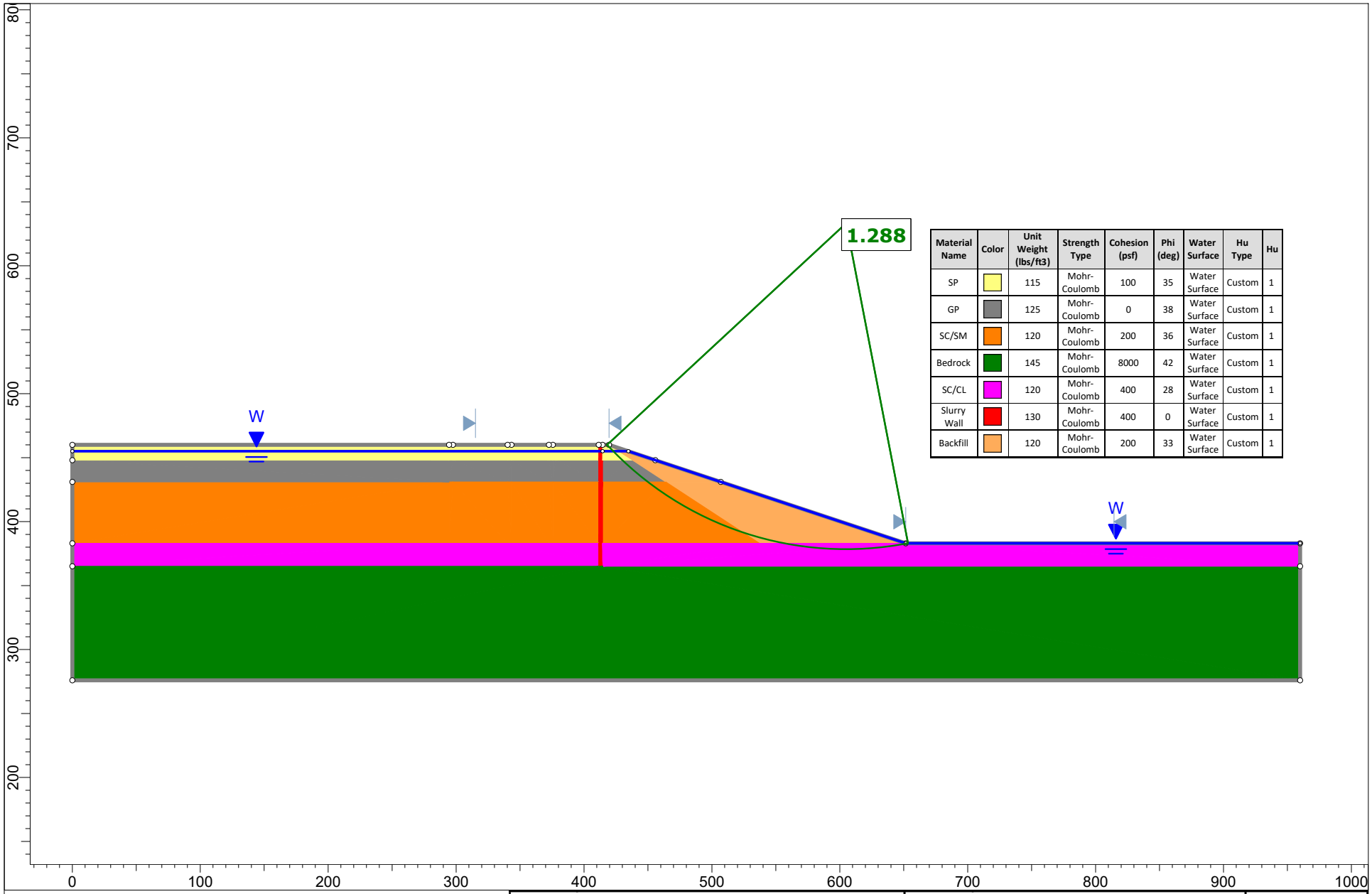
PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
DEWATERED STEADY STATE CONDITIONS
MODERATE STRENGTH SLURRY WALL

DRAWING No. C-26

REV A

3H:1V

RAPID DRAWDOWN



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	400	0	Water Surface	Custom	1
Backfill		120	Mohr-Coulomb	200	33	Water Surface	Custom	1

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PROJECT MCKAY POINT RESERVOIR PROJECT

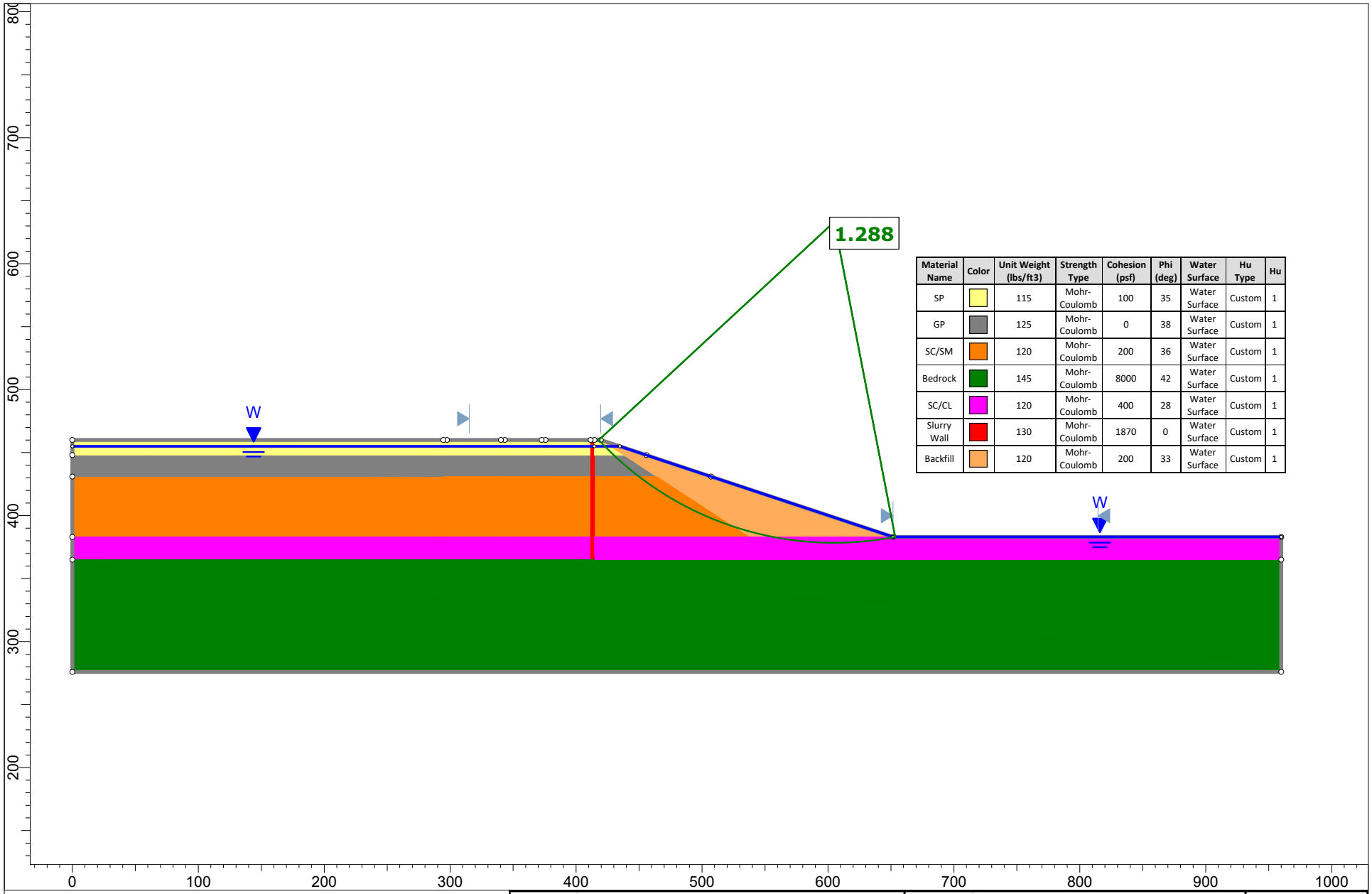
PROJECT NUMBER 117.02125.00002

TITLE

PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
RAPID DRAWDOWN
LOW STRENGTH SLURRY WALL

DRAWING No. C-27

REV A



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Hu Type	Hu
SP		115	Mohr-Coulomb	100	35	Water Surface	Custom	1
GP		125	Mohr-Coulomb	0	38	Water Surface	Custom	1
SC/SM		120	Mohr-Coulomb	200	36	Water Surface	Custom	1
Bedrock		145	Mohr-Coulomb	8000	42	Water Surface	Custom	1
SC/CL		120	Mohr-Coulomb	400	28	Water Surface	Custom	1
Slurry Wall		130	Mohr-Coulomb	1870	0	Water Surface	Custom	1
Backfill		120	Mohr-Coulomb	200	33	Water Surface	Custom	1

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PROJECT **MCKAY POINT RESERVOIR PROJECT**

PROJECT NUMBER 117.02125.00002

TITLE **PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE RAPID DRAWDOWN MODERATE STRENGTH SLURRY WALL**

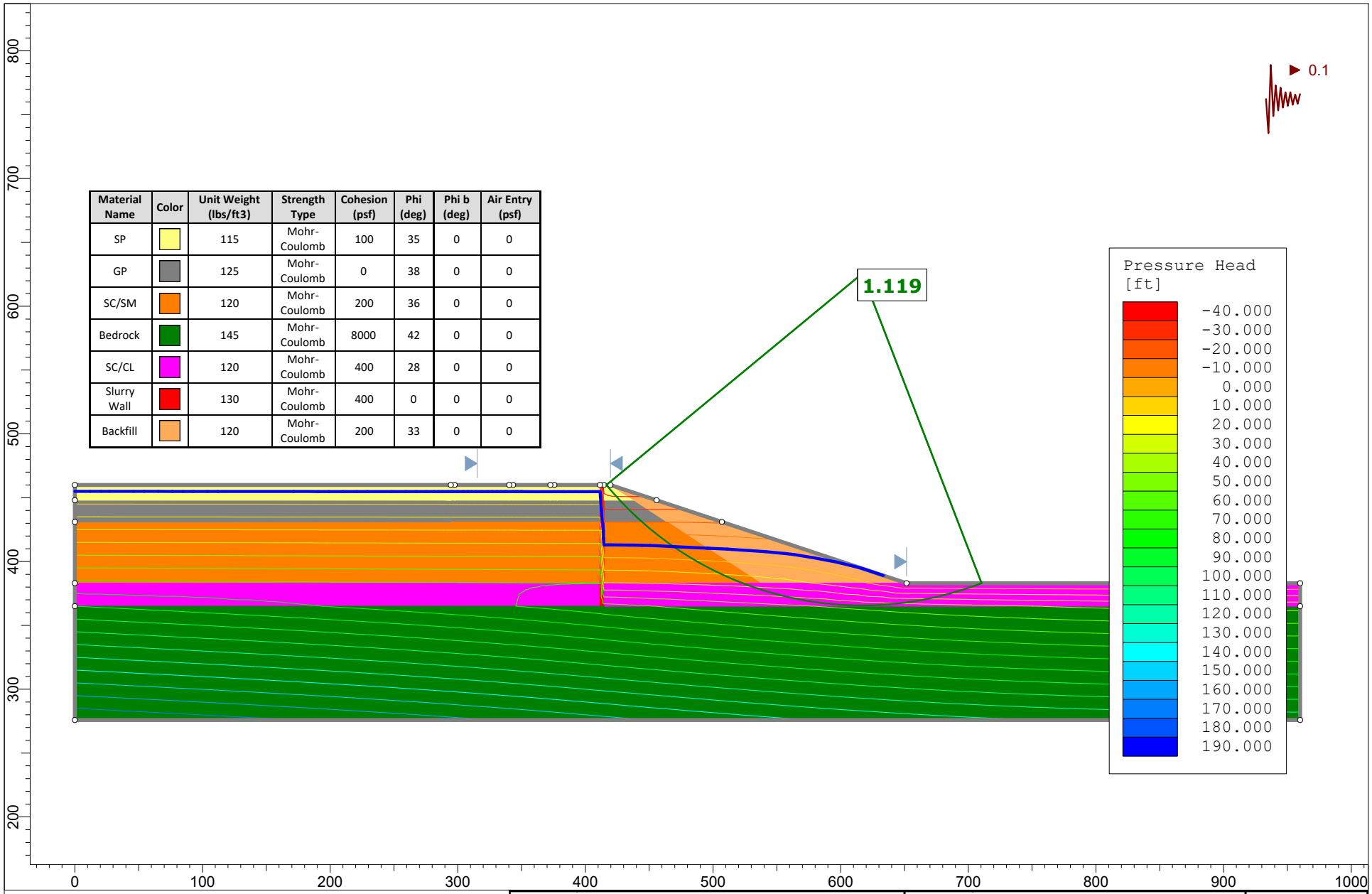
DRAWING No. **C-28**

REV **A**

3H:1V

PSEUDOSTATIC

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	400	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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CLIENT: SESPE CONSULTING, INC.

PROJECT: MCKAY POINT RESERVOIR PROJECT

TITLE: PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE
STEADY STATE PSUDO-STATIC SEISMIC LOADING
LOW STRENGTH SLURRY WALL

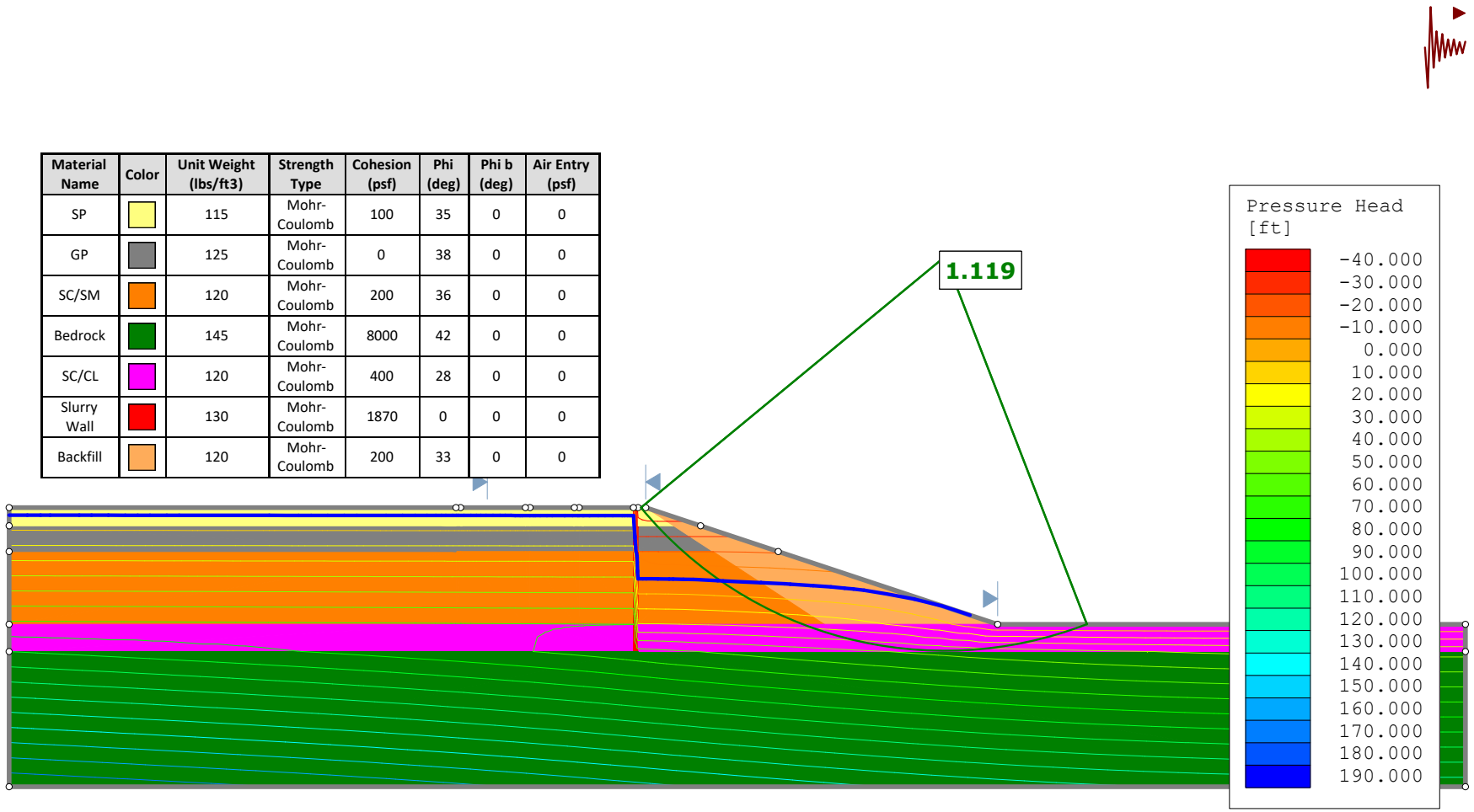
Date Issued: 10/1/2021

PROJECT NUMBER: 117.02125.00002

DRAWING No.: C-29

REV: A

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Phi b (deg)	Air Entry (psf)
SP		115	Mohr-Coulomb	100	35	0	0
GP		125	Mohr-Coulomb	0	38	0	0
SC/SM		120	Mohr-Coulomb	200	36	0	0
Bedrock		145	Mohr-Coulomb	8000	42	0	0
SC/CL		120	Mohr-Coulomb	400	28	0	0
Slurry Wall		130	Mohr-Coulomb	1870	0	0	0
Backfill		120	Mohr-Coulomb	200	33	0	0



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PROJECT MCKAY POINT RESERVOIR PROJECT

PROJECT NUMBER 117.02125.00002

TITLE PERMANENT 3:1 SLOPE OVER 1.5:1 TEMP. SLOPE STEADY STATE PSUDO-STATIC SEISMIC LOADING MODERATE STRENGTH SLURRY WALL

DRAWING No. C-30

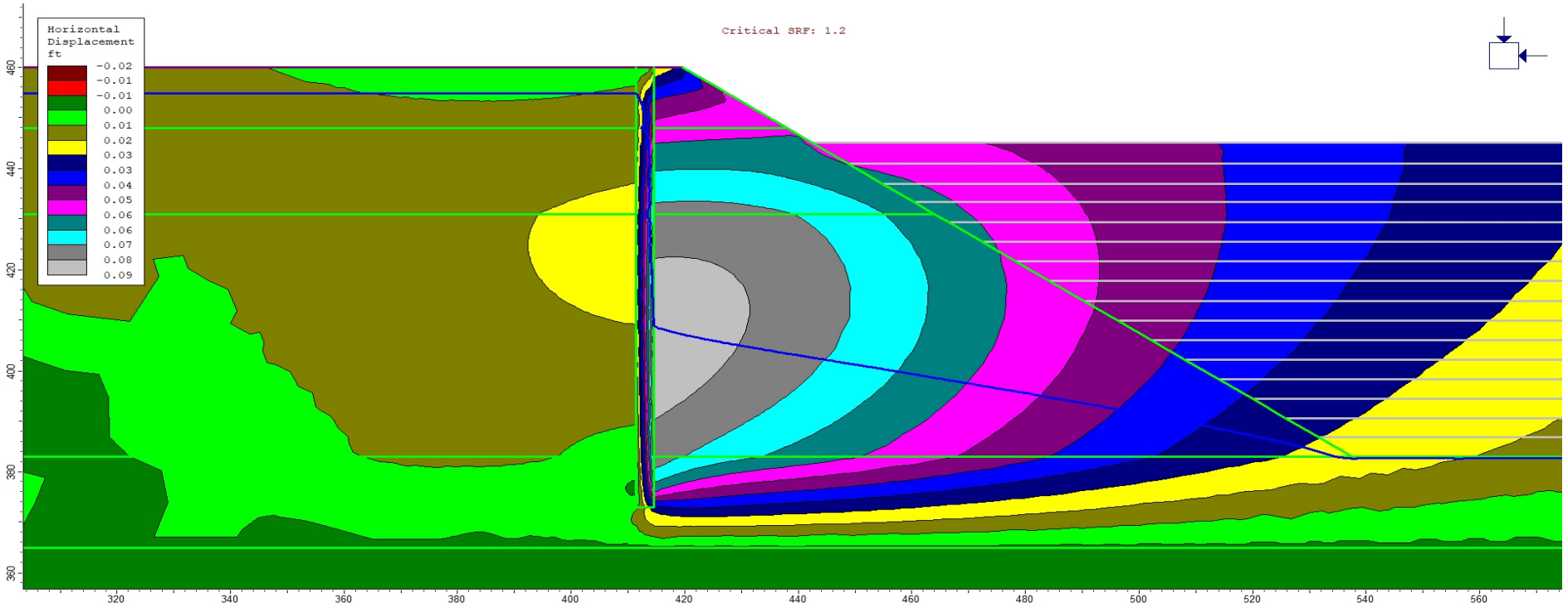
REV A

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ATTACHMENT D

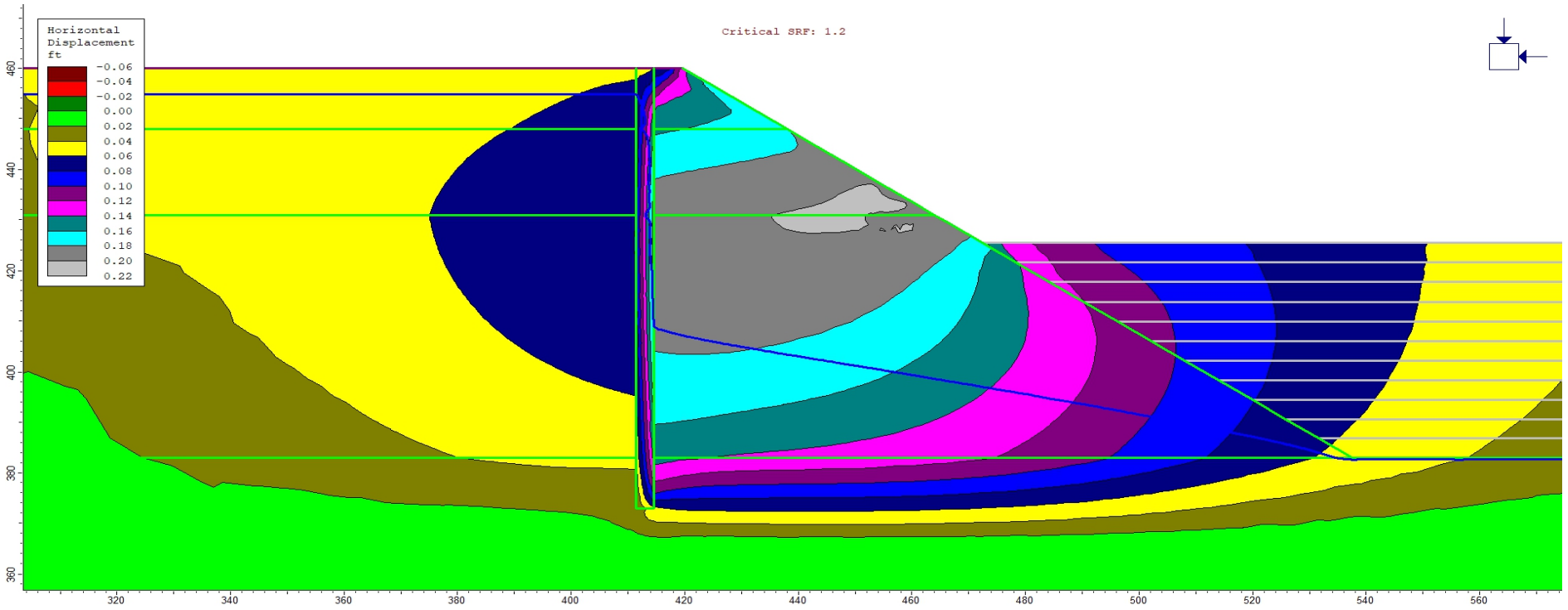
SLOPE AND SLURRY WALL STABILITY

(FINITE ELEMENT ANALYSIS)



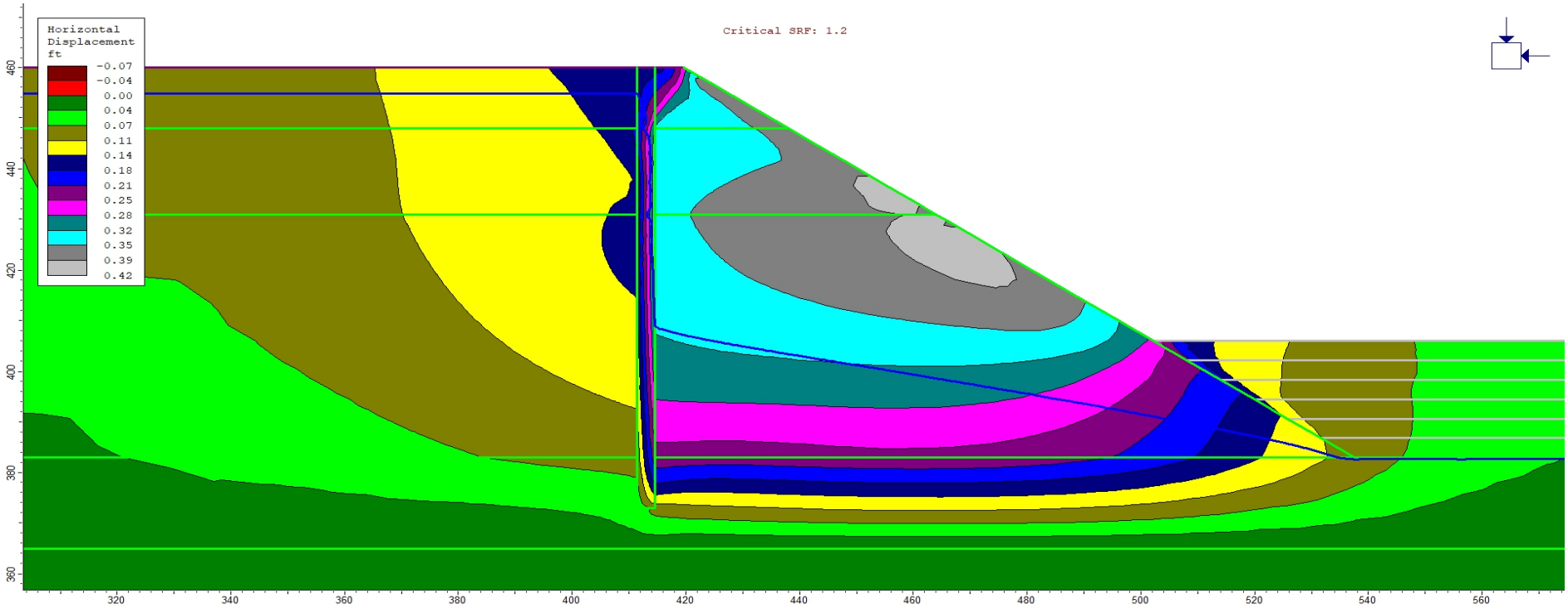
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **1.5H:1V SLOPE 15' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-1**	

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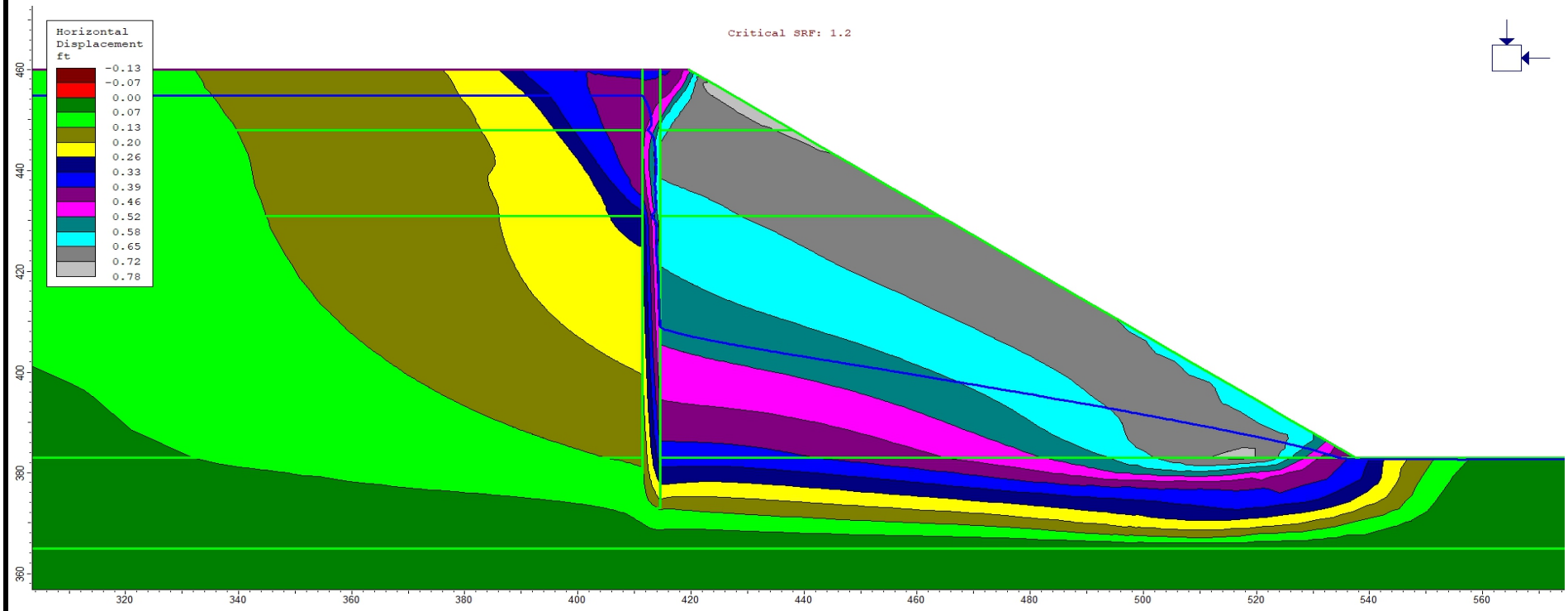
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **1.5H:1V SLOPE 33' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-2**	

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REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **1.5H:1V SLOPE 53' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-3**

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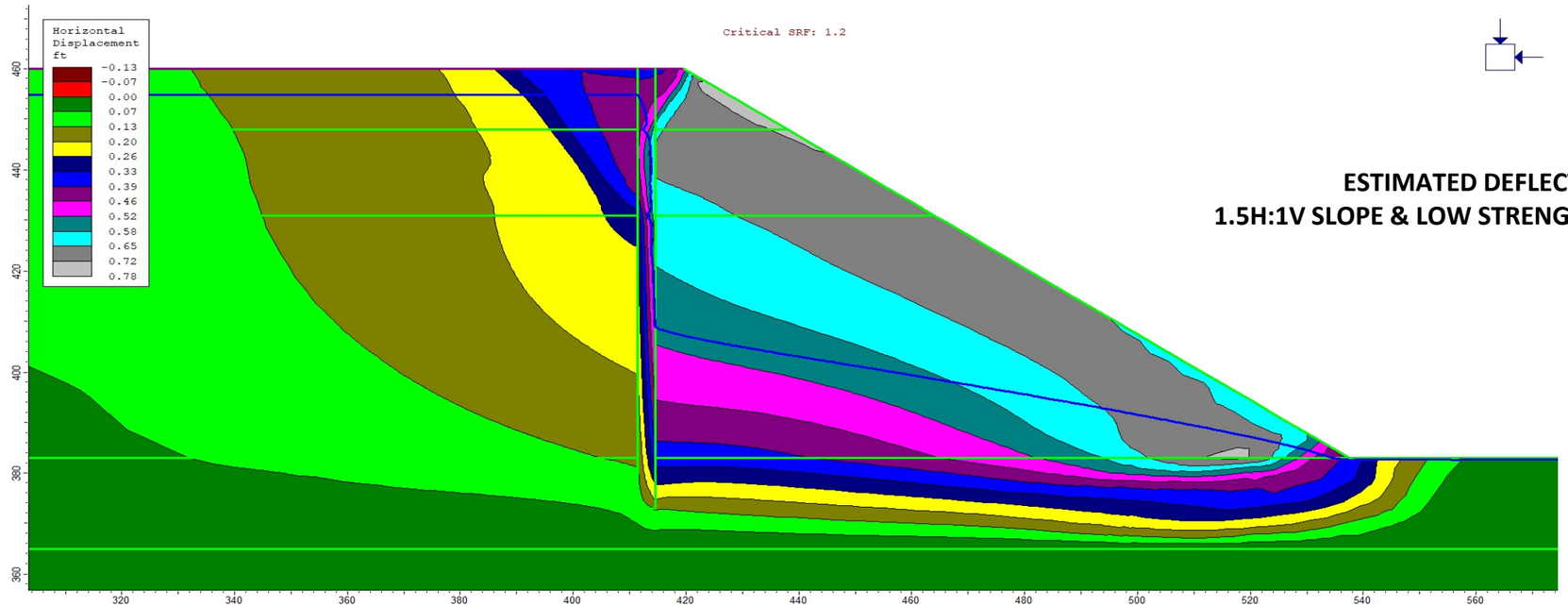
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **1.5H:1V SLOPE 76' EXCAVATION LOW STRENGTH SLURRY WALL**	DRAWING No. **D-4**	

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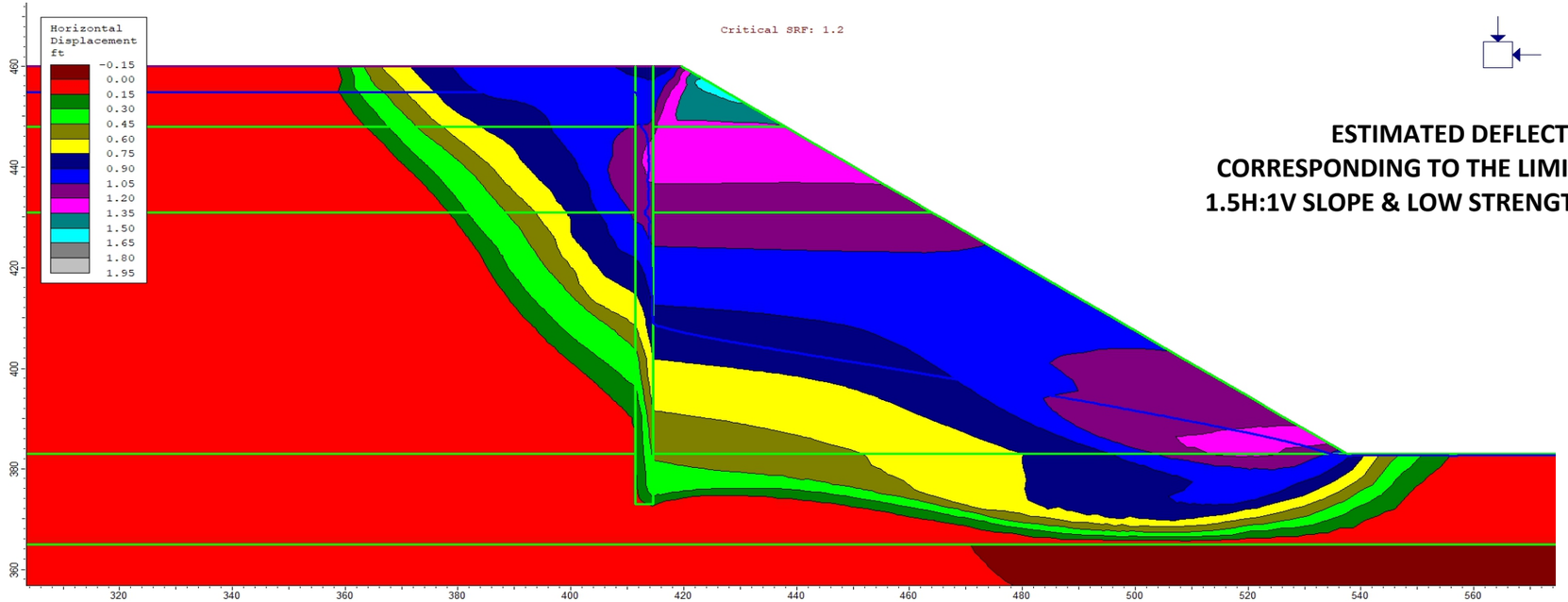
NOTES:

1. Deflection levels (ft) are color coded separately in each plot as shown in the insets.

2. The difference between the deflections under normal conditions (upper plot) and the simulated failure conditions (lower plot) is indicative of the safety margin.



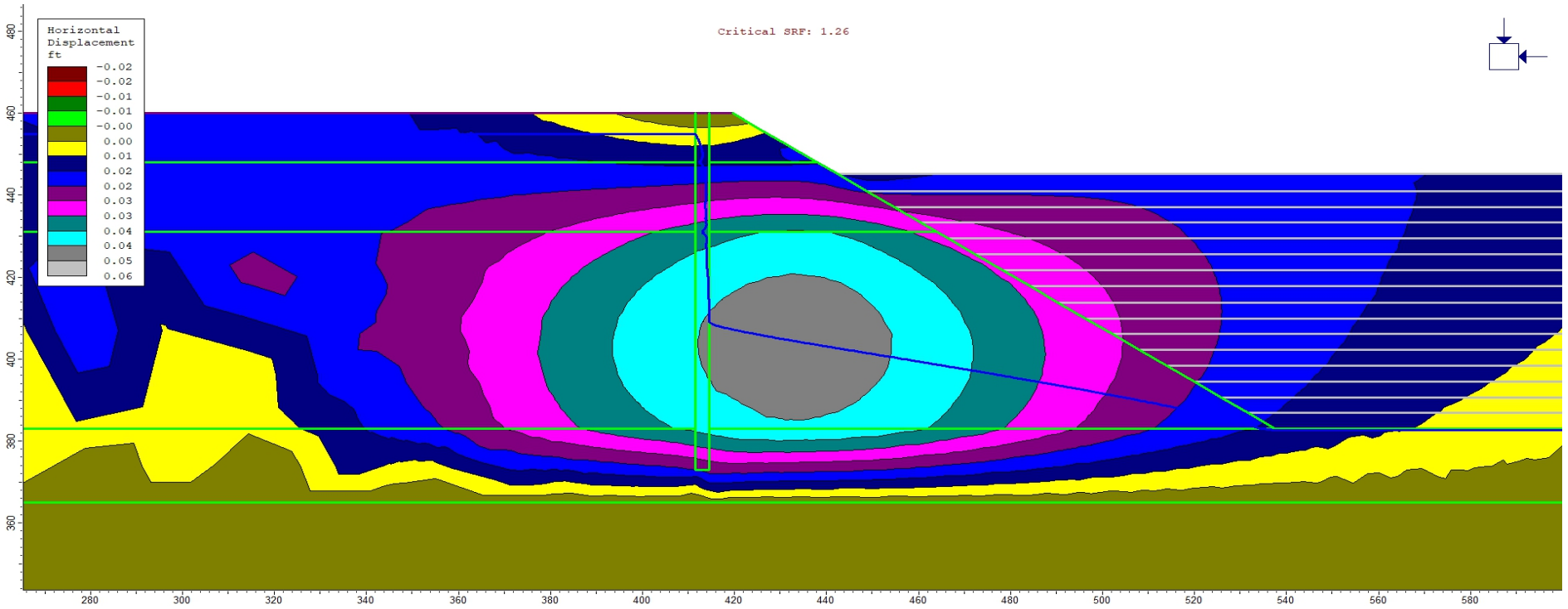
ESTIMATED DEFLECTIONS
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL



ESTIMATED DEFLECTIONS
CORRESPONDING TO THE LIMIT OF STABILITY
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL

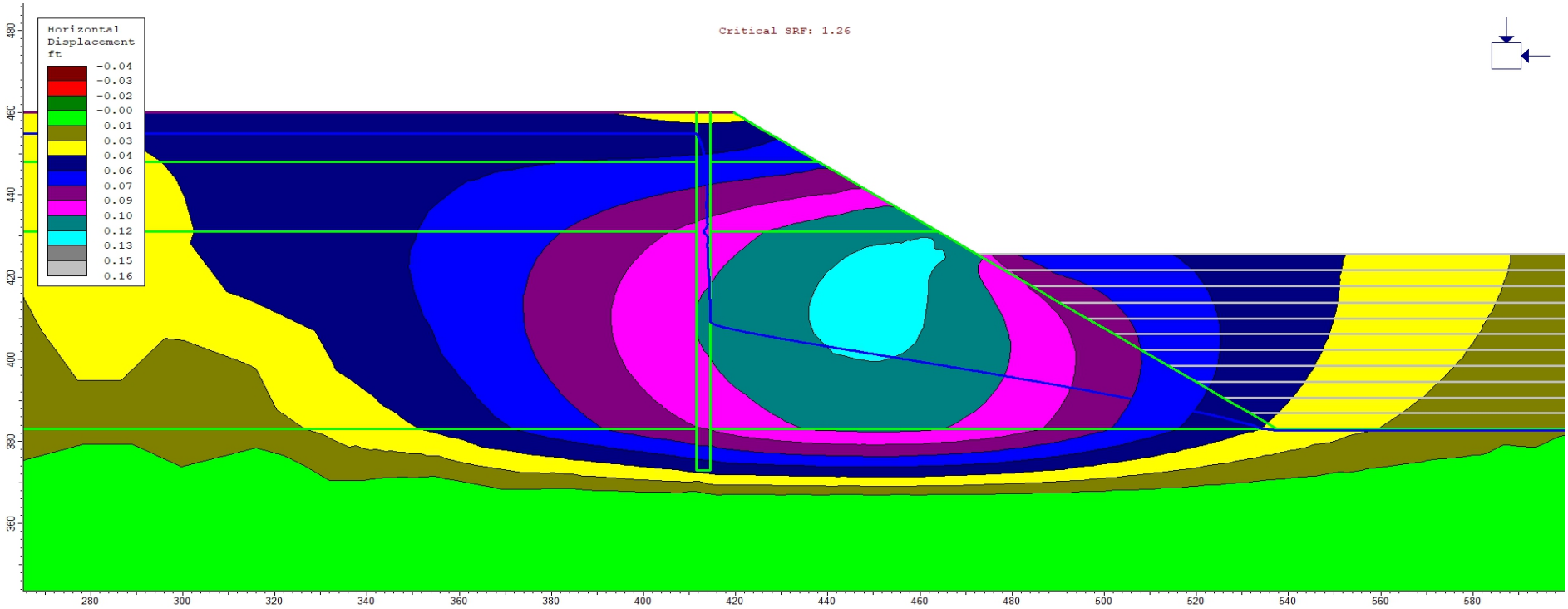
REPORT: **GEOLOGY AND SOILS**	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: 2/28/21
PROVIDED BY: SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE: **1.5H:1V DEFLECTION MARGIN LOW STRENGTH SLURRY WALL**	DRAWING No. **D-5**

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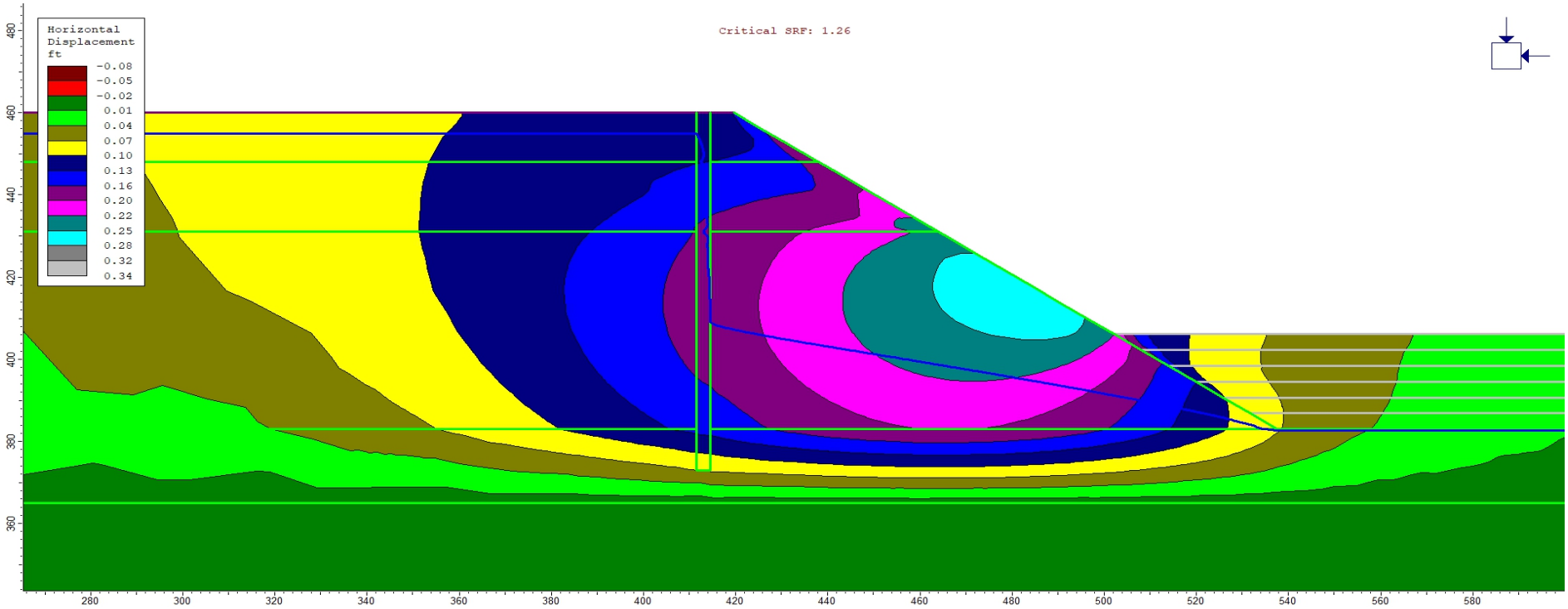
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **1.5H:1V SLOPE 15' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-6**	

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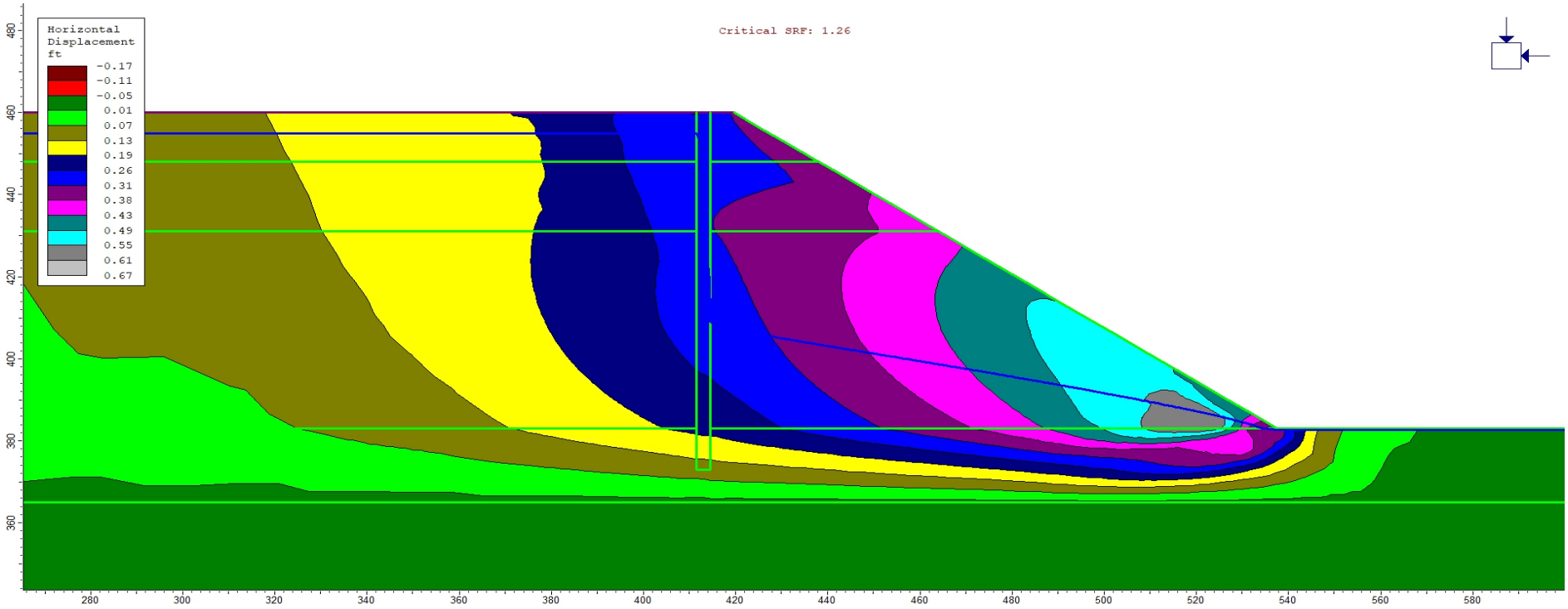
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **1.5H:1V SLOPE 33' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-7**

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		TITLE **1.5H:1V SLOPE 53' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-8**

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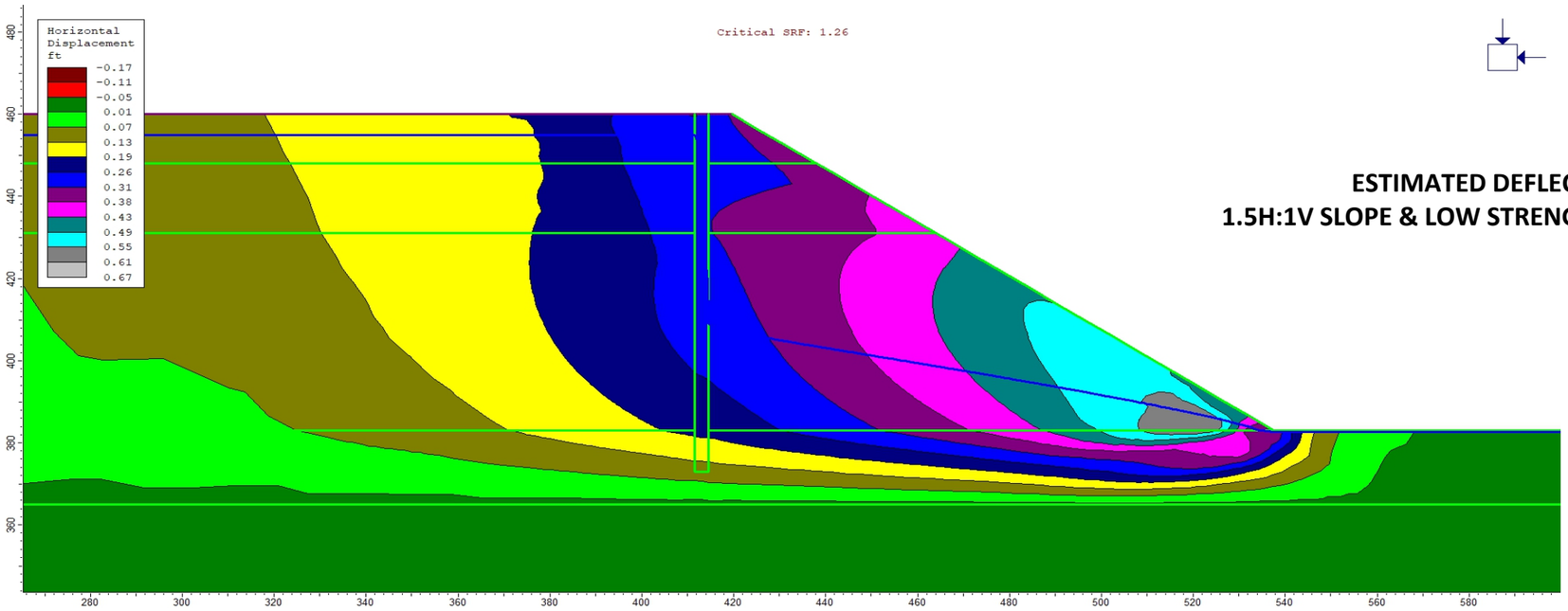
REPORT **GEOLOGY AND SOILS**	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21	
PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **1.5H:1V SLOPE 76' EXCAVATION MID-STRENGTH SLURRY WALL**	DRAWING No. **D-9**	

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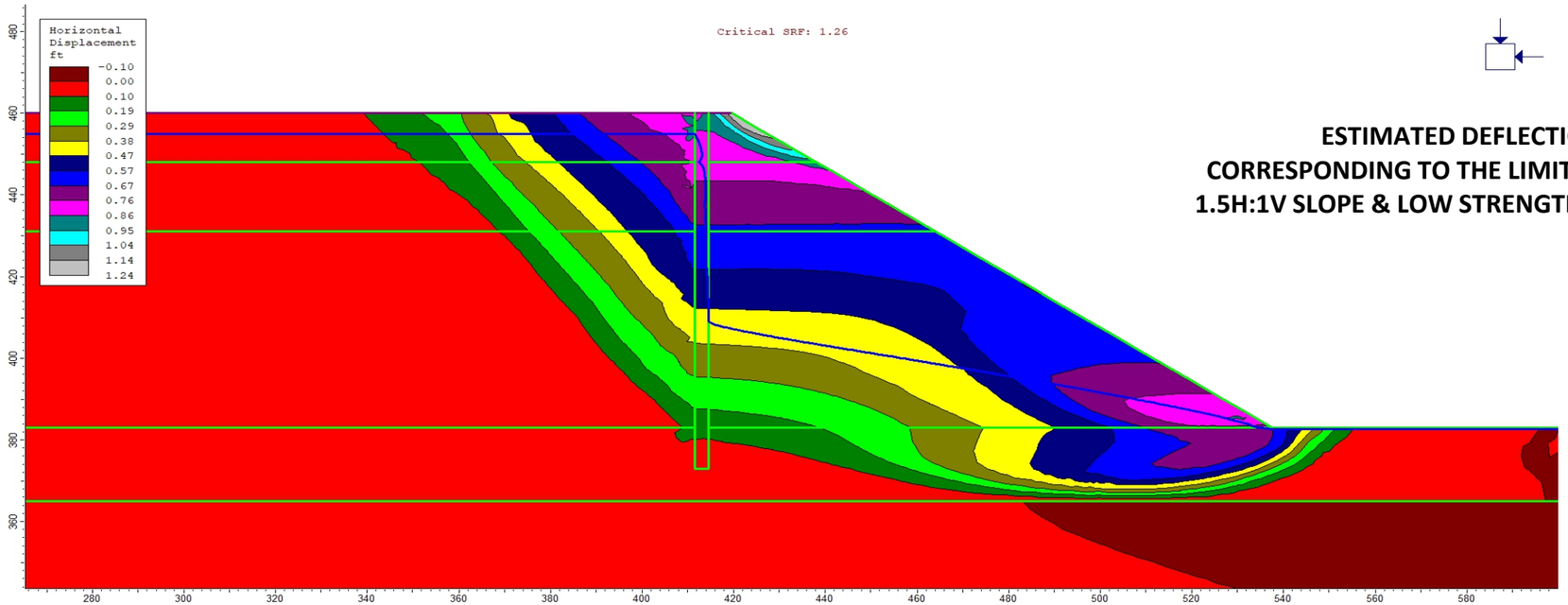
NOTES:

1. Deflection levels (ft) are color coded separately in each plot as shown in the insets.

2. The difference between the deflections under normal conditions (upper plot) and the simulated failure conditions (lower plot) is indicative of the safety margin.



ESTIMATED DEFLECTIONS
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL



ESTIMATED DEFLECTIONS
CORRESPONDING TO THE LIMIT OF STABILITY
1.5H:1V SLOPE & LOW STRENGTH SLURRY WALL

REPORT: **GEOLOGY AND SOILS**	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: 2/28/21
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	TITLE: **1.5H:1V DEFLECTION MARGIN MID-STRENGTH SLURRY WALL**	DRAWING No.: **D-10**

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APPENDIX F-2

Geotechnical Engineering Investigation Report, Proposed McKay Point Reservoir Project, Phase 1: Summary of Field Exploration and Boring Logs
(BSK Associates Engineering & Laboratories, 2011)

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GEOTECHNICAL ENGINEERING INVESTIGATION REPORT PROPOSED MCKAY POINT RESERVOIR PROJECT PHASE 1: SUMMARY OF FIELD EXPLORATION AND BORING LOGS TULARE IRRIGATION DISTRICT TULARE COUNTY, CALIFORNIA

BSK G11-108-11B

Prepared for:

Sespe Consulting Group
468 Poli St., 2E
Ventura, CA 93301

December 19, 2011

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VIA US MAIL & E-MAIL

December 19, 2011 **BSK G11-108-11B**

Mr. Lou Merzario
Sespe Consulting Group
468 Poli St., 2E
Ventura, CA 93301

SUBJECT: Geotechnical Engineering Investigation Report
Proposed McKay Point Reservoir Project
Phase 1: Summary of Field Exploration and Boring Logs
Tulare Irrigation District
Tulare County, California

Dear Mr. Merzario:

BSK Associates (BSK) has completed Phase 1 of the geotechnical investigation for the proposed McKay Point Reservoir Project in Tulare County, California. The enclosed report provides a summary of the geotechnical exploration undertaken at the site starting November 16, 2011 and ending November 20, 2011. BSK logged the samples as they were extracted from the ground during coring. We also performed soil and rock classification per ASTM D2487 and ASTM D2488 on the samples in our Bakersfield lab. The information provided in the enclosed report does not address geotechnical parameters for design of the reservoirs. A more thorough exploration with respect to preliminary recommendations for site preparation and for plans and specifications for the reservoir project will be performed in the future.

We appreciate the opportunity to assist you during the design phase of your project and look forward to continuing our relationship on this project through construction. If you have any questions, please contact us.

Respectfully submitted,
BSK ASSOCIATES

On Man Lau, P.E., G.E.
Bakersfield Branch Manager
California Geotechnical Engineer 2644

REGISTERED PROFESSIONAL ENGINEER
ON MAN LAU
No. 2644
Exp. 12/31/13
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Karl Schwartz, P.E.
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Distribution: Client (3 Originals)
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Figure A2: Boring Location Map
Figure A3: Boring Log Legend
Boring Logs: Borings B-1 through B-6

Appendix B: Laboratory Testing
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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED MCKAY POINT RESERVOIR PROJECT
PHASE 1: SUMMARY OF FIELD EXPLORATION AND BORING LOGS
TULARE IRRIGATION DISTRICT
TULARE COUNTY, CALIFORNIA

1.0 INTRODUCTION

This report presents the results of a Geotechnical Engineering Investigation conducted by BSK Associates (BSK) for the proposed Site located in unincorporated Tulare County, California. The site is located between Lemon Cove and Woodlake as shown on the Site Vicinity Map, Figure A1. This report provides a preliminary geotechnical description of the subsurface conditions at the site. We understand that the locations of the reservoirs as well as the locations of the associated control structures have not yet been determined. Therefore, we do not recommend that the data included in this report be used to generate any kind of geotechnical design parameters. We understand that Phase 2 of this investigation will include a full scale sampling and testing program to determine recommendations for site preparation and geotechnical design parameters for the proposed reservoirs. This report's conclusions and recommendations will not be considered valid unless the Phase 2 of the site investigation is performed by BSK Associates. We recommend that BSK be retained to perform geotechnical review of the design drawings and construction documents throughout the development phase of the reservoir project.

1.1 PLANNED CONSTRUCTION

Based on the information provided by Sespe Consulting Group and Tulare Irrigation District, the proposed reservoirs will be developed to optimize water released during peak power enhancement flows from the Terminus Dam, retain water during periods of high flows, and time releases based on downstream needs. We understand that the site area is approximately 200 acres. The proposed reservoir project includes three reservoirs which will be constructed by excavation. The capacities of the reservoirs range from 700 to 2,500 acre-feet. The proposed depth of the reservoirs is approximately 60 feet below the existing ground surface (bgs).

1.2 PURPOSE AND SCOPE OF SERVICES

The objective of this geotechnical investigation was to characterize the subsurface conditions in the areas of the proposed reservoir areas. The scope of the investigation included a field exploration, laboratory testing, engineering analyses, and preparation of this report.

2.0 FIELD INVESTIGATION AND LABORATORY TESTING

2.1 FIELD EXPLORATION

The field exploration for this investigation was conducted under the oversight of a BSK Staff. Six (6) borings were cored at the site starting on November 16, 2011 and concluding on November 20, 2011. The site was cored using a 600T Full Sonic Truck Sonic Core rig with a 4 inch core barrel using wet and dry coring, as well as high and low frequency vibration and bit rotation speeds. The drilling contractor was Boart Longyear from Upland, California. The borings were cored to depths

ranging from 87 to 93 feet bgs. The locations of the borings are indicated on the Boring Location Map, Figure A2. Details of the field exploration and the boring logs are provided in Appendix A.

2.2 LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate particle size analysis. A description of the laboratory test method and results are presented in Appendix B.

3.0 SITE CONDITIONS

The following sections address the site description, surface and subsurface conditions, and groundwater conditions at the Site. This information is based on BSK's field exploration, and published maps and reports.

3.1 SITE DESCRIPTION AND SURFACE CONDITIONS

The Site is located between Lemon Cove and Woodlake California in Tulare County, California. The site is located in Sections 3 and 4, Township 26 South, Range 20 East. The GPS coordinates for the site location are 36.392° North latitude and -119.046° West longitude. The site is currently an existing cattle pasture. The surface of the site is generally flat with a depression in the southeast "wildlife area". The surface soil at the site primarily consists of loose, medium grained sand with occasional gravel and cobbles. Native grasses and trees are present and they increase in density with proximity to the nearby rivers.

3.2 SUBSURFACE CONDITIONS

Based on the soil boring data, the upper 15 feet of the on-site soil consist of loose clean poorly graded sand with increasing gravel. Below 15 feet, the soil consists of sandy and silty gravel of increasing size and rounded cobbles to approximately 30 to 35 feet bgs. Below 35 feet, particularly on the west side of the site, the soil consists of clayey sand with cobbles. It should be noted that, in the cobble layers, the maximum observed particle size of the cobbles was 4 inches, which is the inside diameter of the core barrel. However, we believe based upon examination of broken cobble fragments in the samples and observation of the surrounding off-site cut-slopes, that the cobble particle size exceeds 4 inches and likely approaches 10 to 16 inches. The cobbles tend to dominate the soil strata at depths ranging from 15 to 65 feet on the west side of the site and 15 to 40 feet on the east side of the site. The depth of the clayey sand with cobbles varied from approximately 65 feet at Boring B-1 to 40 feet at Boring B-4. Below 35 feet on the east side of the side, the soil type was observed to be primarily silty sand with gravel and 3-4 inch cobbles and highly weathered granite silty sand. Below 65 and 40 feet, respectively, the soil consists of multiple layers of silty and clayey sand, highly weathered granite silty sand with gravel, and moderately weathered granite cobbles. At Boring B-4, large unweathered granite boulders were encountered starting at approximately 72 feet. The fracture spacing of the unweathered granite boulders ranged from 4 inches to 3 feet.

The boring logs in Appendix A provide a more detailed description of the materials encountered, including the applicable Unified Soil Classification System symbols.

3.3 GROUNDWATER CONDITIONS

Groundwater was encountered in all of our borings at the site starting on November 16, 2011 and concluding November 20, 2011. Based on field observations of the groundwater conditions at the site, we estimate that the groundwater depth varies from 7 feet bgs at Boring B-6 to 20 feet bgs at Boring B-1.

4.0 LIMITATIONS

The summary submitted in this report is based upon the data obtained from the test borings performed at the locations shown on the Boring Location Map, Figure A2. The report does not reflect variations which may occur between or beyond the borings. The nature and extent of such variations may not become evident until further investigation is initiated. If variations then appear, a re-evaluation of the summary contained in this report will be necessary after performing on-site observations and laboratory testing during future exploration work and noting the characteristics of the variations.

The findings of this report are valid as of the present. However, changes in the conditions of the Site can occur with the passage of time, whether caused by natural processes or the work of man, on this property or adjacent property. In addition, changes in applicable or appropriate standards may occur, whether they result from legislation, governmental policy or the broadening of knowledge.

BSK has prepared this report for the exclusive use of the Client and members of the project design team. The report has been prepared in accordance with generally accepted geotechnical engineering practices which existed in Tulare County at the time the report was written. No other warranties either expressed or implied are made as to the professional advice provided under the terms of BSK's agreement with Client and included in this report.

Respectfully submitted

BSK Associates

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APPENDIX A

Field Exploration

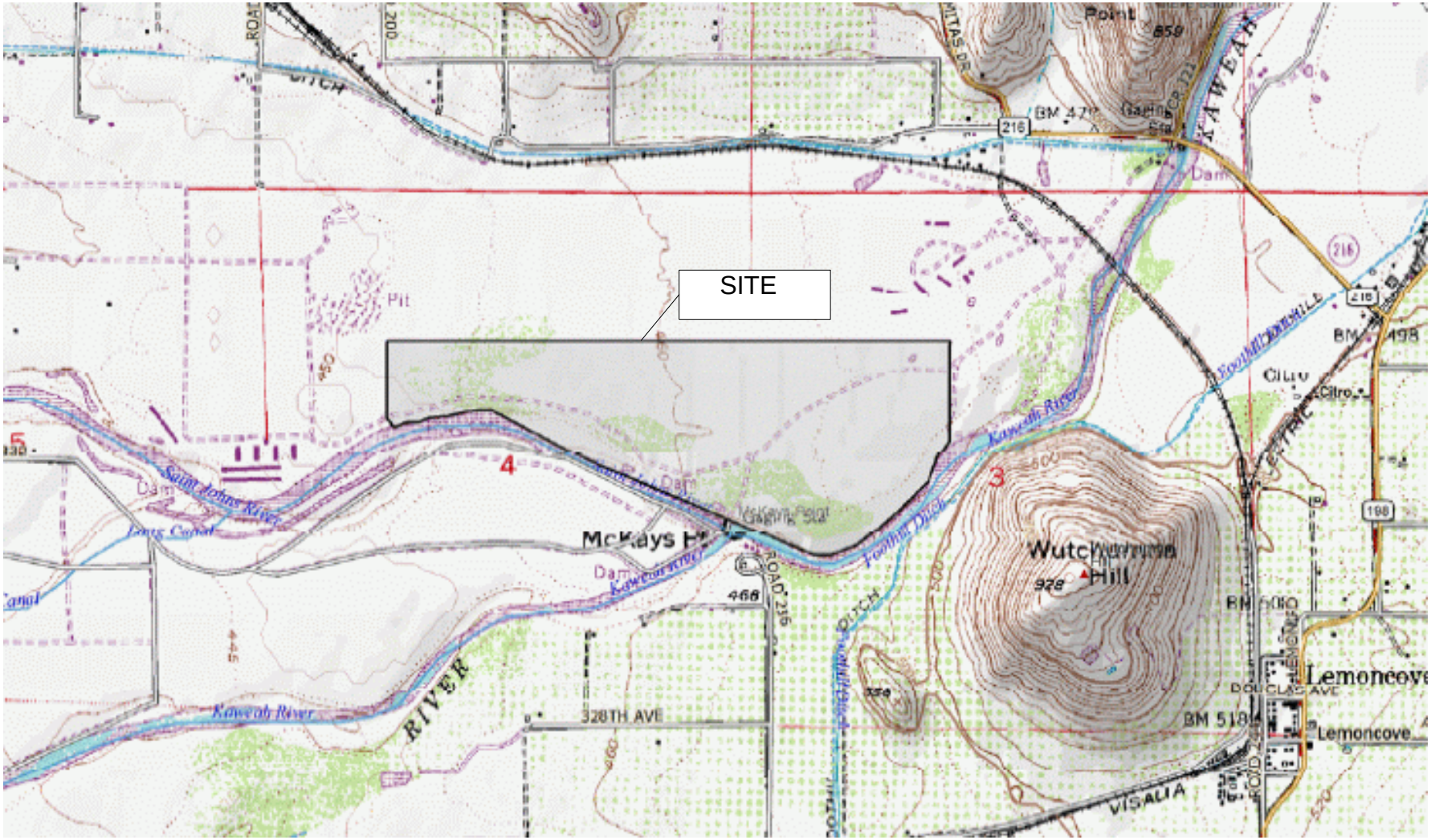
APPENDIX A

FIELD EXPLORATION

The field exploration for this investigation was conducted under the oversight of a BSK Staff. Six (6) borings were cored at the site starting on November 16, 2011 and concluding on November 20, 2011. The site was cored using a 600T Full Sonic Truck Sonic Core rig with a 4 inch core barrel using wet and dry coring, as well as high and low frequency vibration and bit rotation speeds. The drilling contractor was Boart Longyear from Upland, California. The borings were cored to depths ranging from 87 to 93 feet bgs. The locations of the borings are indicated on the Boring Location Map, Figure A2.

The soil materials encountered in the test borings were visually classified in the field, and BSK Staff recorded logs during the drilling and sampling operations. Visual classification of the materials encountered in the test borings was made in general accordance with the Unified Soil Classification System (ASTM D 2488). A soil classification chart is presented herein. Boring logs are presented herein and should be consulted for more details concerning subsurface conditions. Stratification lines were approximated by the field staff based on observations made at the time of drilling, while the actual boundaries between soil types may be gradual and soil conditions may vary at other locations.

Subsurface samples were obtained at the successive depths shown on the boring logs by advancing the sonic core samplers which consisted of a 4-inch inside diameter (I.D.) core barrel sampler. The sampler was advanced using low to high frequency vibration, depending on the material encountered. Water was also added to the system to cool the bit and reduce side friction of the core barrel. The samples were extracted and bagged by the driller and placed in core boxes by BSK Staff. The times, as well as the advancement depths, were recorded for a determination of the penetration rate of the Sonic Core rig during drilling. The penetration rates were observed in the field as an approximate indicator of the strength of the subsurface soil (i.e. fast drilling = loose material, slow drilling = dense material). No formal attempt was made to quantify the relative density of the site soils.



Map Reference:. Delorme Topo North America and USGS Topo Quads

N

Approximate Scale

0 1660 Feet

1 inch = 1660 Feet

SITE VICINITY MAP

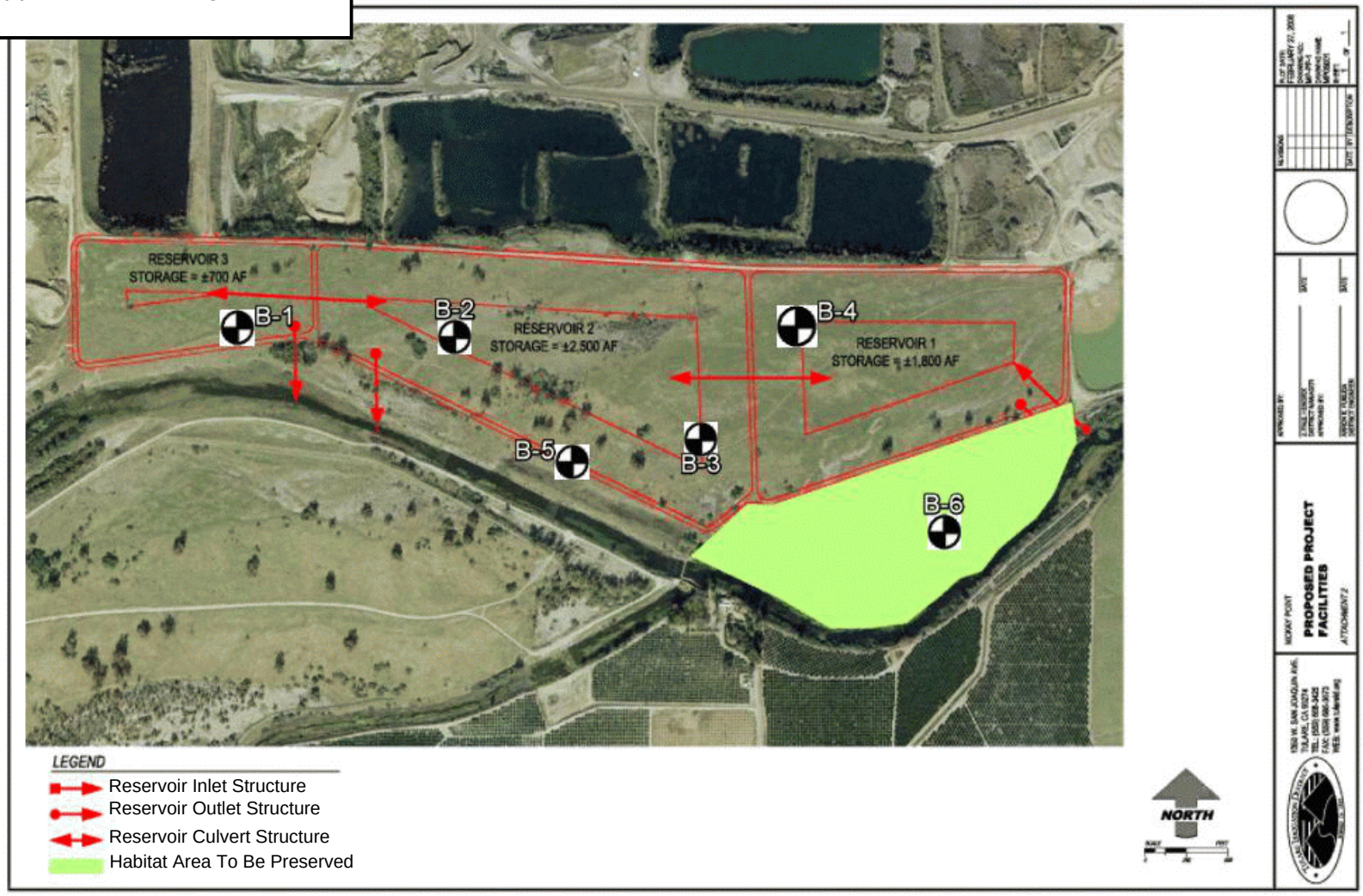
GEOTECHNICAL INVESTIGATION
PHASE 1: SUMMARY OF FIELD INVESTIGATION AND BORING LOGS
TULARE IRRIGATION DISTRICT
TULARE COUNTY, CALIFORNIA

BSK

LEGEND

B-1 Approximate Boring Location

BSK Job No. G11-108-11B
December 2011
Figure B-2



Map Reference:. Google Earth and Tulare Irrigation District

N

Approximate Scale

0 1060 Feet

1 inch = 1060 Feet

BORING LOCATION MAP

GEOTECHNICAL INVESTIGATION
PHASE 1: SUMMARY OF FIELD INVESTIGATION AND BORING LOGS
TULARE IRRIGATION DISTRICT
TULARE COUNTY, CALIFORNIA

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MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More than Half >#200	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL- SAND MIXTURES
		GRAVELS WITH OVER 15% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 15% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS More than Half <#200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS , MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

Note: Dual symbols are used to indicate borderline soil classifications.

	Pushed Shelby Tube	RV	R-Value
	Standard Penetration Test	SA	Sieve Analysis
	Modified California	SW	Swell Test
	Auger Cuttings	TC	Cyclic Triaxial
	Grab Sample	TX	Unconsolidated Undrained Triaxial
	Sample Attempt with No Recovery	TV	Torvane Shear
CA	Chemical Analysis	UC	Unconfined Compression
CN	Consolidation	(1.2)	(Shear Strength, ksf)
CP	Compaction	WA	Wash Analysis
DS	Direct Shear	(20)	(with % Passing No. 200 Sieve)
PM	Permeability		Water Level at Time of Drilling
PP	Pocket Penetrometer		Water Level after Drilling (with date measured)

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA
Unified Soil Classification System

BSK Associates Engineers & Laboratories

PLATE: Figure A-3

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-1

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **458.0**

Location: **N 36.39334, W 119.05555**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light orange brown; medium grained; moist.										
10		… GRAVELLY SAND: Olive gray; coarse grained; moist; with cobbles, increasing to 13 ft.										
15		GP: GRAVEL: Olive gray; coarse sized; moist; with hard rounded cobbles.										
		… GRAVEL: Olive gray; coarse sized; wet; with cobbles.										
20		▽ … GRAVEL WITH COBBLES: (no recovery, very easy drilling, soil type estimated).										
25		… GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles increasing size to 4 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; cobbles to >4 in.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; coarse sized; wet; cobbles decreasing size to 2 in gravel.										
40												
45		… CLAYEY SAND WITH COBBLES: Yellowish brown; coarse sized; wet; 3 in. rounded cobbles.										
50												
55		SP: SAND: Olive gray; coarse grained; wet.										
60		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
65		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; brittle rounded cobbles.										
		… SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles increasing size to >4 in.										
70		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
75		CL: SANDY CLAY WITH COBBLES: Yellowish brown; wet; cobbles size to 3 in.										
		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; medium grained; wet; 3 in. brittle rounded cobbles.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive gray with orange brown streaks; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 20 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-2

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39318, W 119.05082**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light orange brown; medium grained; moist.										
5												
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; moist; with hard rounded coarse gravel.										
17 ▽												
20		… SAND WITH COBBLES: Olive gray; coarse grained; wet; with hard rounded coarse gravel.										
25		GP: GRAVEL WITH COBBLES: Olive gray; coarse sized; wet; cobbles size to 3 in.										
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; coarse grained; .										
35												
40		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
45												
50		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained, brittle gravel; wet.										
55		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained, brittle gravel; wet.										
60		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; .										
65		… CLAYEY SAND WITH COBBLES: Olive brown; coarse grained; wet; hard cobbles to 3 in.										
70		… CLAYEY SAND WITH GRAVEL: Olive brown; fine to coarse grained; wet.										
75		… CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
80		CL: SANDY CLAY: Olive brown; wet.										
85		SC: CLAYEY SAND: Olive brown; fine to coarse grained; wet.										
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/19/11**
Date Completed: **11/19/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 17 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-3

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **465.0**

Location: **N 36.39138, W 119.04547**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light gray to white; medium grained; moist.										
5		" "										
10												
15		… SAND WITH GRAVEL: Light gray to white; coarse grained; moist; gravel increasing size. ▽										
20		GP: GRAVEL: Bluish gray; medium to coarse sized; wet.										
25												
30		SC: CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; hard rounded 3 in. cobbles. … CLAYEY SAND WITH COBBLES: Bluish gray; medium grained; wet; cobbles decreasing size to 2 in. gravel.										
35		… CLAYEY SAND WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; occasional cobbles.										
40												
45		… CLAYEY SAND: Yellowish brown; fine to coarse grained; wet.										
50		SP: SAND WITH COBBLES: Olive brown; coarse grained; wet; cobble size>4 in. … SAND WITH COBBLES: Olive brown; coarse grained; wet; very hard drilling from 49-52 ft.										
55		… SAND: Olive brown; medium grained; wet.										
60		SC: CLAYEY SAND: Olive brown; medium grained; moist.										
65		SP: SAND: Gray; coarse grained; moist.										
70		SM: SILTY SAND: Gray; medium to coarse grained; moist.										
75		ROCK: BOULDERS, COBBLES: Light gray to white; very hard drilling; dry; very hard drilling. … BOULDERS, COBBLES: Light gray to white; very hard drilling; dry; very hard drilling, boulders & large cobbles.										
80												
85		… BOULDERS, COBBLES: Light gray to white; very hard drilling; dry; very hard drilling, large cobbles. … BOULDERS, COBBLES: Light gray to white; very hard drilling; dry; very hard drilling, boulders & large cobbles.										
90												
95		End of boring.										
100												

Completion Depth: **93.0**
Date Started: **11/17/11**
Date Completed: **11/17/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 93 feet. Boring backfilled with grout. Groundwater encountered at 18 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-4

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **467.0**

Location: **N 36.39336, W 119.04339**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: SAND: Light gray to white; medium grained; moist.										
5												
10												
15		… SAND WITH COBBLES: Olive gray; coarse grained; moist; with cobbles, increasing to 17 ft.										
20		GP: SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles to>4 in.										
25		… SANDY GRAVEL: Olive gray; coarse sized; wet; with hard rounded cobbles, decreasing size fine gravel.										
30												
35												
40		SC: CLAYEY SAND: Yellowish brown; medium grained; wet; with gravel.										
45		SM: SILTY SAND: Yellowish brown; medium grained; wet; with coarse gravel. … SILTY SAND: Yellowish brown; medium to coarse grained; wet; with small cobbles and coarse gravel. … SILTY SAND: Light gray to white; dry.										
50												
55												
60		SP: SAND: Olive gray; coarse grained; dry.										
65												
70		ROCK: BOULDERS: Black & White; 0.5 - 1 ft between fractures; dry; very hard drilling, wet coring. … BOULDERS: Black & White; coarse grained; moist; very hard drilling, wet coring. … BOULDERS: Black & White; 1 - 3 ft between fractures; dry; very hard drilling, wet coring.										
75												
80												
85												
90		End of boring.										
95												
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 15 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-5

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **460.0**

Location: **N 36.39099, W 119.04826**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
5		SP: SAND: Light gray to white; medium grained; moist.										
10												
15		GP: SANDY GRAVEL: Olive gray; coarse grained; moist; increasing gravel to small cobbles.										
20		… SANDY GRAVEL WITH COBBLES: Olive gray; coarse grained; wet; increasing cobble size to >4 in.										
25												
30		SC: CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 3-4 in.										
35												
40		… CLAYEY SAND WITH COBBLES: Yellowish brown; fine to coarse grained; wet; cobbles 2-3 in., decreasing to gravel.										
45		CL: SANDY CLAY WITH GRAVEL: Yellowish brown; fine to coarse grained; wet; decreasing gravel to sand.										
50												
55		SC: CLAYEY SAND WITH GRAVEL: Yellowish brown; medium grained; wet.										
60		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
65												
70		SC: CLAYEY SAND: Olive gray; fine to medium grained; moist; very hard drilling.										
75		SM: SILTY SAND: Olive gray; fine to medium grained; moist; hard drilling.										
80		ROCK: BOULDERS AND COBBLES: Gray; dry; hard drilling, very difficult to extract core barrel.										
85												
90		Core barrel refusal at 87 ft. End of boring.										
95												
100												

Completion Depth: **87.0**
Date Started: **11/16/11**
Date Completed: **11/16/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 87 feet. Boring backfilled with grout. Groundwater encountered at 14 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

BSK & ASSOCIATES
700 22nd street
Bakersfield CA 93301
Telephone: 661-327-0671

LOG OF BORING NO. B-6

Project Name: **McKay Point Reservoir**

Location: **Lemon Cove, California**

Job Number: **G11-108-11B**

Plate

Surface El.: **466.0**

Location: **N 36.38976, W 119.04018**

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Samples	Sample Number	Penetration Blows / Foot	Pocket Penetrometer, TSF	% Passing No. 200 Sieve	In-Situ Dry Weight (pcf)	In-Situ Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index
0		SP: POORLY GRADED SAND: Light gray to white; medium grained; moist.										
5		SW-SM: WELL GRADED SAND WITH SILT: Light gray to white; medium grained; moist.										
		▽ SW: WELL GRADED SAND: Light gray to white; fine to medium grained; wet.										
10		SP-SM: POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; fine to coarse grained with gravel; wet; with rounded cobbles to >4 in.										
15		… POORLY GRADED SAND WITH SILT, GRAVEL AND COBBLES: Olive gray; medium to coarse grained with gravel; wet; with rounded cobbles, decreasing size.										
20		GM: SILTY GRAVEL WITH COBBLES: Olive gray; coarse sized, with fine to medium grained sand; wet; with rounded cobbles.										
25		SM: SILTY SAND: Olive gray; fine to medium grained; wet; increasing silt decreasing cobbles.										
30		… SILTY SAND: Olive gray; fine to medium grained; wet.										
		… SILTY SAND: Olive gray; medium grained; wet; with gravel.										
35		" "										
40		… SILTY SAND: Olive gray; fine to coarse grained; moist.										
45		… SILTY SAND: White & Black; fine to medium grained; moist.										
50												
55		SC: CLAYEY SAND: Bluish gray; medium grained; moist.										
60		SM: SILTY SAND: Bluish gray; medium grained; moist.										
65		" "										
70												
75		… SILTY SAND: Bluish gray; medium grained; moist; with gravel.										
80		CL: SANDY CLAY WITH GRAVEL: Bluish gray; dry; with cobbles.										
85		ROCK: BOULDERS AND COBBLES: Bluish gray; dry.										
		" "										
90		… BOULDERS AND COBBLES: Bluish gray; dry; with cobbles.										
95		SC: CLAYEY SAND WITH COBBLES: Bluish gray; medium to coarse grained; dry; with gravel.										
		End of boring.										
100												

Completion Depth: **90.0**
Date Started: **11/18/11**
Date Completed: **11/18/11**
Logged By: **K. Schwartz**
Checked By: **O. Lau**

Drilling Equipment and Method: Sonic Core w/ 4 inch Core Barrel, 6 inch Casing

Remarks: Boring terminated at 90 feet. Boring backfilled with grout. Groundwater encountered at 7 ft.

GEOTECHNICAL 08 FIGURE A-5 MCKAY POINT RESERVOIR BORING LOGS.GPJ GEOTECHNICAL 08.GDT 12/19/11

APPENDIX B

Laboratory Testing Results

APPENDIX B

Particle Size Analysis Tests

Eight Particle Size Analysis Tests were performed on core samples retrieved from particular depths at a selected boring (B-6) in an area of the proposed reservoirs. The tests were performed in general accordance with Method ASTM D422. The results of the tests are presented on Figure B-1.

Project:	MacKay Point Reservoirs
Client:	Sespe Consulting
Project Number:	G11-108-11B
Test:	Particle Size Analysis (ASTM D422) w/o hydrometer

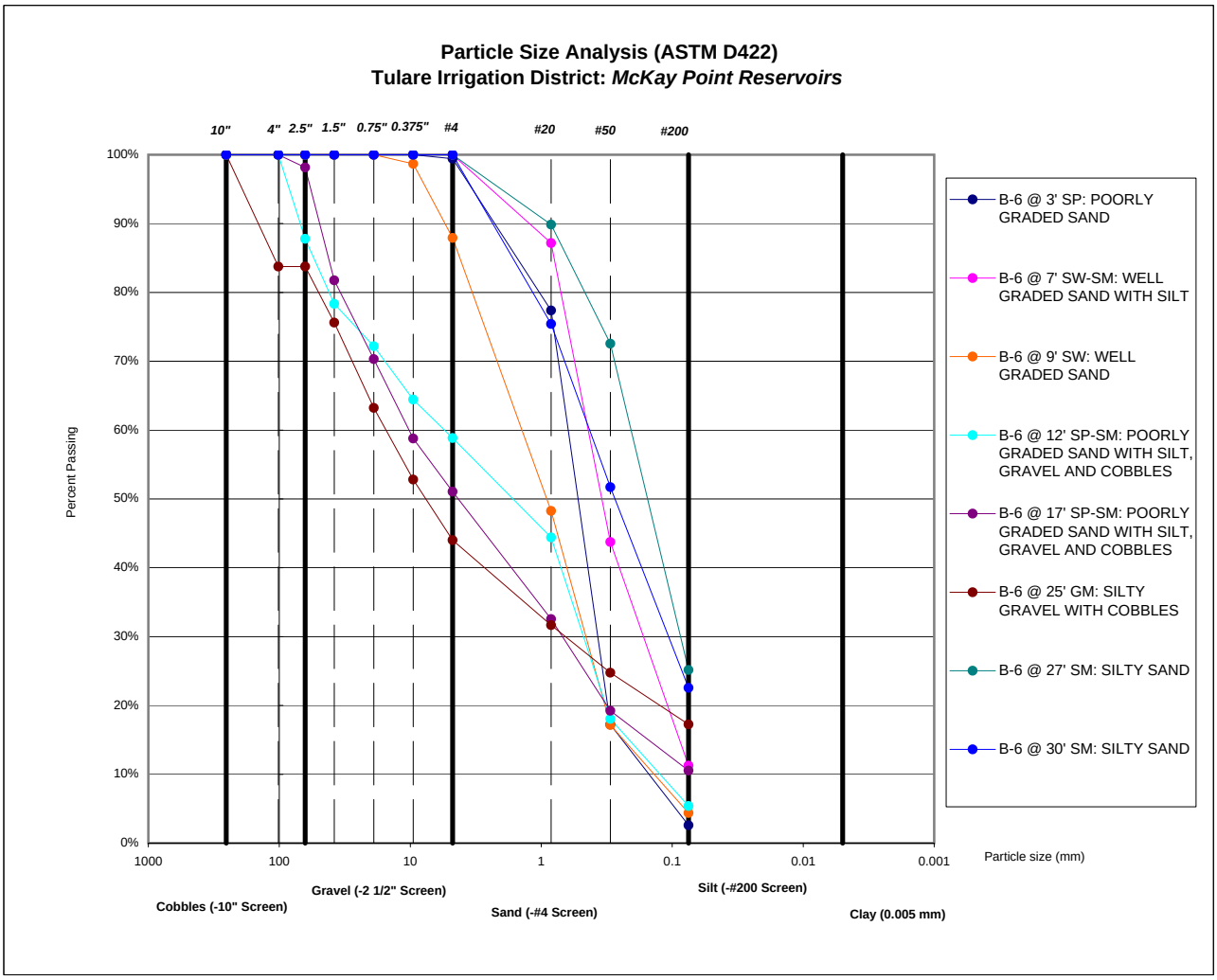


Figure B-1

APPENDIX G

McKay Point Reservoir Project – Hydrogeology and Water Quality Technical Study
(SLR Consulting Limited, 2016)

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global environmental solutions

MCKAY POINT RESERVOIR PROJECT

Hydrology and Water Quality Technical Study

SLR Ref: 117.01263.00001

January 25, 2022

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Hydrology and Water Quality Technical Study

Prepared for:

SESPE CONSULTING
468 Poli St.
Suite 2A
Ventura, California 93001

This document has been prepared by SLR International Corp. The material and data in this report were prepared under the supervision and direction of the undersigned.



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Senior Associate



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Principal

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1. INTRODUCTION

1.1. BACKGROUND

This document addresses potential CEQA relevant impacts on hydrology and water quality associated with the Project. Impacts on potential flooding, surface water drainage, groundwater flow, groundwater supply, and water quality are considered.

The hydrology and water quality conditions of the Project were assessed through review of Applicant-submitted documents, existing publicly available data and reports, and field observations. The Applicant has prepared documentation regarding groundwater conditions as presented in *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project* (Schmidt, 2012) and *McKay Point Project*. Data from other publicly available documents were reviewed and evaluated as part of this assessment.

This document includes a discussion of the general Site conditions including environmental setting, climate, surface-water conditions, and groundwater conditions. The design and the construction stages of the Reservoir are described. Anticipated changes to the baseline conditions due to the Project are also evaluated. Finally, potential impacts to hydrology and water quality are evaluated based on the California Environmental Quality Act (CEQA) Appendix G significance criteria.

1.2. PROJECT OVERVIEW

The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Kaweah and St. Johns Rivers in Tulare County, California, commonly referred to as the McKay Point Project area or Site (Figures 1 and 2). Together, the Owners are the holders of pre-1914 and appropriative water rights on the Kaweah and/or the St. Johns Rivers, and they own storage capacity rights in Lake Kaweah formed by the impoundment of water behind the Terminus Dam.

The Owners are also members of the Kaweah and St. Johns Rivers Association (Association), which oversees the surface water rights and diversion operations on the Kaweah River. The Owners propose to develop approximately 200 acres of the total 500-acre McKay Point property on the north side of the divergence of the Kaweah and St. Johns Rivers into a surface water storage and reregulation reservoir (Reservoir) as shown on Figures 2 and 3. When completed, the Reservoir will serve as a surface water storage/re-regulation facility. The Owners will also use the Reservoir to optimize groundwater recharge in basins within the Kaweah subbasin.

West Coast Aggregate (WCA) will excavate the Reservoir in accordance with plans and specifications to be developed. WCA intends to process the resulting aggregate materials (i.e., rock, sand, and gravel) within the Project Site (Figures 2 and 3). WCA would then sell processed materials such as Portland Cement Concrete (PCC) grade aggregate, used by their customers

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offsite to manufacture concrete and asphaltic concrete products. WCA will also recycle concrete construction debris at their facility.

The Reservoir capacity is expected to be 4,600-acre feet. Its depth is expected to range from approximately 60 to 80 feet locally, with a typical average depth of approximately of 75 feet. The material excavated during construction will consist of resource-grade aggregate and will be processed at the WCA facility to be established within the excavation area.

Upon completion of the Reservoir excavation, water will be periodically diverted from the Kaweah River and stored in the Reservoir to achieve the following objectives:

- Store winter runoff and release in summer when required downstream.
- Reduce flood peaks during periods of high flows.
- Store Kaweah River water when the Owners' systems are at capacity so that additional water can be released later to be used for groundwater recharge within the Owners' respective service areas.

The Reservoir will extend vertically below the groundwater levels, and the Applicant will implement dry mining methods to recover the aggregate and to create the Reservoir. Dewatering of the excavated area will be conducted, as necessary to allow for dry mining techniques.

The Reservoir phase of the Project will entail storage and release of surface water only. To minimize groundwater from entering the excavation and the Reservoir, a slurry wall will be installed around the perimeter to decrease groundwater seepage. While some amount of seepage inflow will occur during periods when the Reservoir is not full, this seepage will be pumped out and returned to nearby groundwater. The slurry wall will also minimize stored water losses from the Reservoir to groundwater when it is full.

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2. ENVIRONMENTAL SETTING

2.1. REGIONAL SETTING

The Site is in California's Central Valley near the western boundary in the foothills of the Sierra Nevada Geomorphic Province of California (Figure 1). The southern San Joaquin Valley bounds this part of the Sierra Nevada to the west and the Great Basin to the east. The Central Valley is one of the most productive agricultural regions in the world.

The Site vicinity is drained by the Kaweah and St. Johns Rivers, which drain ultimately to the Tulare Lakebed in the southern end of the San Joaquin Valley (Figure 4). In 1962, Lake Kaweah, located upstream from the Site, was created by the construction of Terminus Dam on the Kaweah River. Renovations of this dam in 2004 significantly reduced flooding at the Site and the surrounding area.

The Site is in the eastern portion of Kaweah Sub-basin of the San Joaquin Valley Groundwater Basin. This area is underlain by young and old unconsolidated fluvial deposits (sandy and silty gravels, clayey sand and cobbles, and silty and clayey sands) that originated from the nearby Sierra-Nevada Mountains. These moderately to highly permeable silts, sands and gravels extend to depths of several hundred feet or more.

2.2. LOCAL SETTING

The Site is currently undeveloped and has been used for cattle grazing under lease arrangements. Most of the Site is vegetated with native grasses.

The surface soil at the Site primarily consists of loose, medium-grained sand with occasional gravel and cobbles. Site surface drainage east of the river split is generally to the south and southeast toward the Kaweah River and west of the river split generally to the south and southwest toward the St. Johns River. The Site elevation slopes from approximately 472 feet above mean sea level (msl) at the northeastern end of the property, downward to approximately 454 feet above msl at the southwestern end.

2.3. CLIMATE

2.3.1. CURRENT CONDITIONS

Climate in the Site vicinity is typical of the foothill region of the central valley, with cool rainy winters having a mean daily temperature ranging from 40° to 50° F and hot dry summers when daytime temperatures can exceed 100° F (Table 1). During the summer months, a high-pressure system off the west coast of California prevents precipitation from occurring in the area. During the winter, this high-pressure system is intermittent, allowing Pacific storms to bring rainfall to the foothills. Rainfall increases with elevation in the foothills and the ranges. Most of the precipitation occurs from November through April.

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TABLE 1: SITE VICINITY CLIMATE SUMMARY													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average Max. Temperature (^{O}F)	56.5	62.9	68.6	75.6	84.4	92.8	99.3	97.5	91.2	80.3	66.7	56.8	77.7
Average Min. Temperature (^{O}F)	37.0	40.6	43.6	47.2	52.4	58.2	63.2	61.7	57.4	50.5	42.1	36.9	49.2
Average Total Precipitation (inch)	2.73	2.44	2.48	1.50	0.57	0.14	0.01	0.03	0.20	0.70	1.46	2.10	14.38
Average Total Snowfall (inch water)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Average Snow Depth (inch)	0	0	0	0	0	0	0	0	0	0	0	0	0
Pan Evaporation (inch)	1.37	1.81	3.13	4.50	7.31	9.17	10.55	9.70	7.93	5.17	2.40	1.42	64.46
Evaporation data from Army Corp of Engineers (2014), Terminus Dam, California, period of record 2001-2007. All other climate data from WRCC (2014), Lemon Cove, California, period of record 1899-2013.													

2.3.2. CLIMATE CHANGE

Based on studies conducted for the Greater Kaweah Groundwater Sustainability Agency (GEI/GSI, 2020) the following changes to the precipitation, evapotranspiration, and runoff in the East Kaweah Basin are projected for 2030 and 2070 respectively. These projections are compared to current, or baseline conditions determined for the period 1981 to 2010.

Precipitation

Annual precipitation is projected to change very little, by approximately 0.5% either up or down. However, the seasonal distribution of precipitation will change with increases projected for Winter and late Summer and decreases in Spring. Specific projected changes are:

- 2030 Precipitation:
  - Annual increase of 0.06 inches or 0.4%
  - Increases in the November to April period; maximum increase in March (0.25 inches or 10%)
  - Decrease in the May through July period; maximum decrease in May (-0.08 inches or -14%)
  - Increase in the August to September period; maximum increase in August (negligible or 9%)
- 2070 Precipitation:
  - Annual decrease of -0.09 inches or -0.6%.
  - Increases in the December to March period; maximum increase in January (0.46 inches or 17%).
  - Decrease in the April through June period; maximum decrease in May (-0.18 inches or -31%).

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- Increase in the July to September period; maximum increase in September (0.05 inches or 25%).

Evapotranspiration

Annual evapotranspiration is projected to increase, by approximately 3.2% to 8.2%. Maximum increases are projected to occur in the Winter and Spring periods. Specific projected changes are:

- 2030 Evapotranspiration:
  - Annual increase of 2.1 inches or 3.2% measured as pan evaporation.
  - Maximum relative increases occur in January (0.06 inches or 4.3%) and June (0.35 inches or 3.8%).
- 2070 Evapotranspiration:
  - Annual increase of 5.3 inches or 8.2% as pan evaporation.
  - Maximum relative increases occur in December (0.18 inches or 12.8%) and May (0.58 inches or 8.0%).

Under these conditions it can be expected that the crop demands for water will generally increase in proportion to the increased evapotranspiration estimates; by approximately 3% to 8% over time.

Runoff

Annual runoff is projected to be reduced by approximately -5% by and after 2030. A significant change is projected to occur in the seasonal distribution of runoff. Under current and the projected 2030 conditions the peak inflows occur, and are projected to occur, in May each year, i.e., in mid Spring. By 2070 inflows are predicted to peak in late Winter, two months earlier than March.

Strom Precipitation

As part of California's Fourth Climate Change Assessment, the California Energy Commission sponsored a study of the projected changes to California's precipitation intensity-duration-frequency curves which evaluated how the intensity and frequency of 1-to-7-day precipitation events would change for extreme storms such as the 25-year to 100-year events, compared to those experienced in from 1950 to 1999. The projections were made for the period 2050 to 2099 (50-years). The work was undertaken by the University of California, Irvine (UCI, 2018).

The general conclusions of the study are that extreme precipitation is expected to increase across most cities in California. Climate model simulations under the RCP8.5[1] project that in the future, the frequency of what is currently a 50-year event could double in both Southern and Northern California. This means that areas across California may experience extreme precipitation that is more intense and twice as frequent, relative to historical records.

[1] A Representative Concentration Pathway (RCP) is a greenhouse gas (GHG) concentration trajectory generally adopted by the Intergovernmental Panel on Climate Change (IPCC) for climate change forecasting. The RCPs describe the possible changes in future anthropogenic (i.e., human) GHG emissions. RCP 4.5 is described by the IPCC as an intermediate scenario. Emissions peak occurs around 2040, and then declines. RCP 8.5 emissions continue to rise throughout the 21st century and this pathway is generally taken as the basis for worst-case climate change scenarios.

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He closest city to the Project that was analyzed is Fresno. Evaluation of the climate change effect on one-day storm precipitation frequencies for Fresno indicates, for example, that the precipitation values for a return period of 100-years would increase by 14% to 19% for the RCP4.5 and RCP8.5 scenarios respectively for the 50-year future projection period. The current storm precipitation amounts would occur more frequently. For example, the annual probability of occurrence of the current 100-year precipitation which is 1% could be increased to between 1.4% and 1.9% respectively, i.e., this storm event would become nearly twice as likely.

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3. BASELINE CONDITIONS

This section contains descriptions of the existing (baseline) Site geologic and hydrologic conditions.

3.1. REGIONAL AND LOCAL GEOLOGY

The Central Valley has been formed by millions of years of deposition of Quaternary sediments derived from the uplifted Sierra Nevada and Coast Ranges, which bound the Central Valley on its east and west sides (Figure 1). The Central Valley is an alluvial plain, approximately 50 miles wide and 400 miles long (north south). Sediments have been deposited into the Central Valley for the last 160 million years and are thousands of feet thick in certain areas.

Numerous rivers and streams originating in the higher elevations of the Sierra Nevada, including the Kaweah River, flow westward into the Central Valley, depositing Quaternary alluvial sediments upon which the Site is located (Mathews and Burnett, 1965). This alluvium is underlain by a sequence of marine and continental sedimentary rocks consisting of shale, siltstone, and sandstone and locally granitic rock. Beneath the sedimentary rocks lie an impermeable basement complex of igneous and metamorphic rocks that extend as deep as 13,000 feet bgs. These basement rocks are a subsurface extension of the same rocks that occur in the Sierra Nevada (Faunt et al., 2009). A geologic map of the region is included as Figure 5

A total of 6 soil borings were conducted at the Site in November 2011 (BSK, 2011). Based on these borings and hydrogeologic interpretations by Schmidt (2012), the thickness of fluvial sediments within the Reservoir area ranges between approximately 40 and 100 feet. Alluvial deposits at the Site consist of sand that is about 15-20 feet thick. Luhrdorff and Scalmanini (1995) describe these sediments as Younger Alluvium. Below this sand interval, cobbles, boulders with sand, clay and silt are common. These deposits extended to a depth of about 40 feet on the eastern portion of the Site, and to about 100 feet on the western portion. Luhrdorff and Scalmanini (1995) describe these sediments as Older Alluvium. Geologic cross-sections for the Site have been prepared by Schmidt (2012) and for this study, which are included in Attachment A.

Weathered bedrock was not encountered in borings on the western portion of the Site but was encountered at approximately 77 ft bgs in two borings drilled at the eastern portion of the Site. The bedrock encountered is likely Mesozoic granitic rocks of the Sierra-Nevada batholith, which has been mapped as outcrops at higher elevations within a few miles to the north, east and south of Site. The weathered bedrock is presumed to underlie the entire Site but is apparently present at various depths (Attachment A). Discontinuous intrusions of clay or clayey sand were also occasionally encountered.

3.2. GROUNDWATER

The shallow aquifer at the Site is composed of the alluvial fan deposits associated with the local rivers. In some areas near the Site where overlying sediments are relatively thin, such as the Lemon Cove and Lindmore areas south of the Site, weathered bedrock forms the predominant aquifer. For example, one Lemon Cove public supply well is screened in the bedrock aquifer.

Most of the groundwater production south of the Kaweah River is from the bedrock interval (Schmidt, 2012).

Regionally, groundwater flows generally toward the west from the recharge areas of the Sierra Nevada mountains to the center of the valley (Figure 6). Groundwater elevations in the region vary from around 460 feet amsl near the Site, to around 250 ft amsl near the City of Visalia (DWR, 2014). Groundwater is pumped in the area for agricultural and urban uses.

The Site is in the Kaweah Subbasin, within the Tulare Lake Hydrologic Region (DWR, 2003). The Site is also near the eastern boundary of the Kaweah Delta Water Conservation District (KDWCD) (District; Figure 7). Approximately 265,000 acres of the district is irrigated for agriculture, and about 45,000 acres is urbanized. Numerous public and private entities within the district boundaries divert water from the river and its distributaries mainly for irrigation. In addition, almost all the land within the KDWCD receives some irrigation water obtained from groundwater, often as a supplement to surface water (Groundwater Sustainability Plan - GWSP, GKGSA, 2020).

KDWCD and surrounding areas have been in long-term groundwater overdraft. The KDWCD wide overdraft for the period 2007 to 2017 was estimated at approximately 78,000 AF/yr. Most of the overdraft occurs in the western portion of the district; not the Project vicinity (GKGSA, 2020).

In January 2020, the Greater Kaweah Sustainability Agency (GKGSA) published its "Groundwater Sustainability Plan" (GWSP). The purpose of the GWSP, is among others, to identify and describe Minimum Thresholds and Measurable Objectives for each monitoring location for each applicable Sustainability Indicator, as required to achieve the Sustainability Goal, and to define and identify Projects and Management Actions proposed by the GKGSA to achieve the Sustainability Goal. The Sustainability Plan area and its jurisdictional boundaries are shown on Figure 8. The Reservoir will be in Hydrogeologic Zone 10 within these boundaries. For this zone, the Minimum Threshold and Measurable Objective groundwater levels have been established for Well KSB-2822 (also referred to as 18S27E05J001M), located between the St. Johns and Kaweah Rivers (Figure 9), as 421 and 420 feet amsl respectively. The levels at KSB-2822 are at the Minimum Threshold and Measurable Objective levels established by the GKGSA).

The shallow aquifer in the Site vicinity is unconfined (Schmidt, 2012) and water levels are significantly higher than the Minimum Threshold and Measurable Objective levels. The long-term water level measurements for wells in the region surrounding the Site indicate stable water levels, except for temporary declines during drought periods (Figure 9). Seasonal water level fluctuations in the Site vicinity have generally varied by less than 20 feet for the last 50 years (Fugro, 2007). Within the Site, approximate water level elevations ranged from 463 feet amsl near the east edge of the Lemon Cove Facility, to just under than 430 feet amsl in the western part of the Site in December 2011 (Figure 10) based on six borings sampled during the site investigation program. The CEMEX excavations located immediately to the north of the Site, have exposed groundwater because of the permitted surface mining on that site. As presented in Attachment B, groundwater level elevations have ranged from about 438 to 443 feet amsl in the area immediately northwest of the Site, to between 456 to 460 feet to the northeast of the Site in the 2008 to 2010 period.

The main source of recharge to the aquifers in the Site area is groundwater flow form the east. Localized groundwater gradients suggests that the St. Johns and Kaweah Rivers lose some of their flow to infiltration, and that these rivers are sources of groundwater recharge. Other sources

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of groundwater recharge in the Site vicinity include infiltration of water used for irrigation, and infiltration from local irrigation ditches in the area and from seasonal surface water flow.

3.3. GROUNDWATER WATER QUALITY

Groundwater in the region is generally considered suitable for beneficial uses, including municipal/domestic, industrial, and agricultural purposes except for a few instances that are discussed below. In the project vicinity, groundwater quality is favorable with respect to physical parameters (total dissolved solids, pH, and specific conductivity), and other major constituents related to potability (such as chloride, and sulfate, and nitrate). Groundwater in the project area generally reflects the properties of local surface water runoff, which serves as a replenishment source. While there are localized occurrences of high dissolved minerals or high nitrate levels due to the influence of land use (e.g., infiltration of irrigation tailwater), groundwater generally satisfies Title 22 Drinking Water Standards and is utilized as a drinking water source for municipalities, small community systems, and individual households. High concentrations of iron and manganese are also known to occur in the region, which in some instances may exceed secondary drinking water standards (Luhdorff and Scalmanini, 2004).

Consistent with the regional characteristics, groundwater quality at the project site is characterized by relatively low conductance and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition. Samples collected from monitoring wells completed in the younger alluvium and the older alluvium at the project site had specific conductance values of 120 to 260 mhos/cm and total dissolved solids (TDS) levels of 95 to 170 mg/l (Jones & Stokes, 1998). Calcium and bicarbonate are the predominant cation and anion. Compared with sources to the west, the groundwater in the project area exhibits lower mineralization due to the apparent influences of surface waters in the Kaweah and St. Johns Rivers (Bookman-Edmonston 1972). ·

Several locations surrounding the project vicinity have experienced degraded groundwater quality in the shallower aquifers due to agricultural practices in the area. Examples include the Lemon Cove area, the areas immediately south of Wutchumna Hill and west of the Reservoir, which have elevated levels of nitrate in groundwater, up to approximately 100 mg/L (Schmidt, 2001).

The City of Woodlake has also reported problems with elevated nitrate concentrations and is concerned with any project that may increase degradation (Jones & Stokes, 1998). Other than nitrate, groundwater and surface water in the Site vicinity appear suitable for existing beneficial uses (Fugro, 2007).

3.4. SURFACE WATER

3.4.1. CURRENT CONDITIONS

The east side of the San Joaquin Valley consists of a broad plain formed by coalescing alluvial fans associated with streams draining the western slopes of the Sierra Nevada (Figure 4). The southern end of the San Joaquin Valley is known as the Tulare Basin. The Tulare Basin is hydrologically closed. Instead of flowing to the ocean, streams from the Sierra Nevada flowing into the Tulare Basin terminate at depressions, the largest of which is the Tulare Lakebed.

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The primary natural surface water bodies in the Site vicinity are the Kaweah and St. Johns Rivers, which form the eastern and southern Site boundaries. The Kaweah River flows westward from its headwaters in the Sierra Nevada. Along the southern Site perimeter at a location referred to as McKay Point, the Kaweah River diverges into two rivers, forming the St. Johns River and the Lower Kaweah River. Several ponds are located just north of the Site at the adjacent CEMEX operation (Figure 2). A pond is also located on the Kaweah River Rock property to the west of the Site. These ponds consist of exposed groundwater, created by previous mining beneath the groundwater elevation.

Downstream of the Site, the Kaweah River historically branched into 8 or 10 shallow channels that overflowed during high flows, creating marshlands. These shallow channels were later integrated into irrigation canals and ditches for the delivery of irrigation water in support of agriculture irrigation. These channels still carry non-irrigation flow to Tulare Lakebed but only during periods of extraordinary precipitation or snow melt (Figure 4; Army Corps, 1990).

In 1962, Lake Kaweah (the Lake), located approximately 3 miles upstream of the Site, was created by the construction of Terminus Dam (Figure 4). Construction of this dam provided storage of irrigation water and flood protection for downstream areas. The Lake has a capacity of approximately 185,630 AF. Flood control considerations require that, between November and March, a portion of the Lake volume be reserved to store runoff in high rainfall or snowmelt events. Therefore, during a wet year the Lake typically releases most of the water to maintain low levels. In a dry years Lake outflow is typically very low in winter with sporadic increases in response to significant precipitation or snowmelt conditions.

Storage for water supply begins in late winter and releases occur in late spring and early summer. In wetter years, releases may begin in late winter and remain high (above 1,500 to 2,000 cfs) through spring and late summer (EPA, 2005; US Army Corp. 2005, Kaweah, and St. Johns Rivers Association - Water Master Reports though 2007). Water released from the Terminus Dam serves multiple local water districts such as the Tulare Irrigation District (TID) and Kaweah Delta Water Conservation District (KDWCD) as well as several small ditch companies. The dam also discharges water to generate hydroelectricity.

During a typical average year streamflow upstream from McKay Point (gauge Kaweah River at McKay Point) is intermittent for about 8 months during late summer through late winter (September through April (Watermaster Reports). When they occur, flows can typically range up to 1,000 to 2,000 cfs. During June and July flows are more consistent with maximum flows still ranging up to approximately 2,000 cfs or higher (Table 2 below).

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TABLE 2: KAWEAH RIVER AT MCKAY POINT – MONTHLY FLOWS – (PERIOD 2001-2020)													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Average (cfs)	313	355	298	314	731	1,359	1,265	525	94	15	61	127	455
Minimum monthly (cfs)	-	-	-	-	8	454	207	15	-	-	-	-	61
Maximum monthly (cfs)	1,862	2,071	2,241	1,709	2,241	2,303	2,135	1,609	701	178	668	723	1,274
Average (AF)	19,261	19,701	18,301	18,665	44,939	80,854	77,805	32,286	5,577	907	3,637	7,832	329,765
Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020.													

The annual flows vary significantly and since 2001 have ranged from 43,815 AF/year to 922,247 AF/year. The gauged values are summarized in Table 3 below. In approximately 30% of the years the flow is above average, and in the remaining 70% of the years, below average.

TABLE 3: KAWEAH RIVER AT MCKAY POINT – ANNUAL FLOWS IN AF/YEAR – (PERIOD 2001-2020) – BOLD VALUES ARE YEARS WITH ABOVE AVERAGE FLOWS										
Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow	211,316	237,860	**358,716**	176,410	**548,184**	**640,557**	115,958	266,014	242,324	454,670
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-20
Flow	**746,509**	200,737	99,523	52,893	43,813	287,178	**922,247**	202,334	**631,189**	156,873
Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.										

Flows arriving at McKay point are divided between the St. John and Kaweah Rivers by the McKay Point Structure which consists of two flow control structures, one in the St. Johns and one in the Kaweah River. These water control facilities are owned and operated by the Kaweah Delta Water Conservation District and the Kaweah & St. Johns Rivers Association. Both check structures are located immediately downgradient of McKay Point (Figure 3). The check structures can be closed or opened to control flow rates in the St. Johns and Kaweah Rivers.

Dry Creek flows into the Kaweah between Terminus Dam and McKay Point and is the largest source of runoff below Terminus Dam (Figure 4). Dry Creek flows southward from its headwaters and joins the Kaweah approximately one mile down from Terminus Dam. Water supply diversions begin immediately downstream of the dam through Hawkeye, Lemon Cove, and Foothill Ditches, and flows diverted are less than 10,000 AF/yr. total. Farther downstream, Wutchumna Ditch Company diverts water into Bravo Lake, a 4,000 AF Reservoir (U. S. Army Corps of Engineers, 1990).

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Spills from the irrigation systems of the Kaweah and St. Johns Rivers are limited to the above average years as shown by the measured flows in Table 4.

TABLE 4: SPILLAGES FROM THE KAWEAH AND ST. JOHNS RIVER IRRIGATION AREAS MEASURED AT (1) ELK BAYOU BELOW ROAD 96 AND (2) CROSS CREEK AT HIGHWAY 43 TO TULARE LAKE – ANNUAL FLOWS IN AF/YEAR – (PERIOD 2001-2020)

Year	2000-01	-02	-03	-04	-05	-06	-07	-08	-09	-10
Flow (1)	0	0	530	0	201	9,940	0	0	0	0
Flow (2)	0	0	0	0	0	19,406	0	0	0	0
Year	2010-11	-12	-13	-14	-15	-16	-17	-18	-19	-110
Flow (1)	11,833	0	0	0	0	0	8,028	0	3,521	0
Flow (2)	0	0	0	0	0	0	37,814	0	331	0

Streamflow data from the annual Water Master Reports (Kaweah & St. Johns Rivers Association) for the period of record 2001 to 2020. Year is based on the October to September time frame.

3.5. FLOODING

Before the Terminus Dam was constructed, extraordinary storm events in December 1955 resulted in an estimated peak flood discharge at McKay Point of 87,000 cfs, which is the largest peak runoff from the Kaweah River watershed in the 20th century. Since the construction of Terminus Dam in 1962, most flooding concerns for areas downstream of the dam were greatly alleviated. For example, the peak average daily inflow to Lake Kaweah during the 1966 flood was 105,000 cfs, whereas the maximum release from the dam was 5,666 cfs. Lake Kaweah is operated with an objective of maintaining a flow of less than 5,500 cfs at McKay Point, which includes flow from undammed tributaries such as Dry Creek. Above this flow rate, flood damage can occur to downstream properties, infrastructure, and municipalities (U. S. Army Corps of Engineers, 1990).

The Terminus Dam height was increased by approximately 21 feet in 2004, which further reduced flooding in the area (U. S. Army Corps of Engineers, 2005). It is estimated that currently the dam provides protection for a design flood event of 50-year return period (FEMA, 2009).

FEMA has prepared a flood hazard map for the area including the Site (Figure 11). FEMA has calculated base flood elevations for the Kaweah and St. Johns Rivers, but only for stretches downstream of McKay Point. The map indicates that the 100-year flood level near the Site along the St. Johns River is approximately 465 feet amsl. During most flooding conditions, major and minor flooding in the area is dissipated by diversions to the network of irrigation ditches, irrigation diversions, channel percolation, and evapotranspiration (U. S. Army Corps of Engineers, 1990).

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3.6. SURFACE WATER QUALITY

Surface water near the project Site is generally considered suitable for beneficial uses including municipal, domestic, agricultural and groundwater recharge purposes. Virtually all municipal and industrial water supply in the region is derived from groundwater and surface water is essentially used exclusively for agricultural purposes. As such, the surface water quality is classified as Class I for irrigation by the Department of Water Resources. The water is characterized by relatively low conductance and dissolved solids and is of calcium-bicarbonate to calcium-sodium bicarbonate in composition (Luhdorff & Scalmanini, 2004)

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4. PROJECT DISCUSSION

4.1. INTRODUCTION

This section describes the reservoir objectives, includes a discussion of the initial excavation and final construction of the Reservoir, the design of the excavation, slurry wall, and final Reservoir. It provides the water balance analyses for both the excavation and Reservoir operational stages and describes how the reservoir would be operated. The section concludes with an analysis of the water supply and flood control benefits that would be achieved.

4.2. RESERVOIR OBJECTIVES

Once the Reservoir is completed, the Owners will utilize the Reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, groundwater recharge supplies, and to provide for additional flood flow reductions by temporarily storing high flood waters. Its purpose is to provide multiple benefits including:

- Capturing and re-regulating water made available to the Owners during flood releases from Terminus Dam.
- Capturing and re-regulating water entitlements belonging to the Owners released from Terminus.
- Capturing and re-regulating any other water sources on the Kaweah River, such as Dry Creek, that may be made available to the Owners.
- Allowing other entities with water rights on the Kaweah River to capture and/or re-regulate flows when designated by the Owners.
- Allowing other entities to capture and/or re-regulate flows of the Lower Kaweah River and St. Johns River for purposes of storm water runoff and flood prevention with permission of the Owners and Kaweah/St. Johns water rights interests.
- Effectively extending the Owners' irrigation and/or groundwater recharge season by storing additional Kaweah River water during events in which the Owners' delivery systems are at capacity.

The Reservoir would be constructed in such a way that revenue can be obtained to offset the construction and development costs. Locating the Reservoir adjacent to the Kaweah River allows for easy connection between the river and the Reservoir, thus minimizing the need for pipelines. The elevation of the water surface above McKay Point in the Kaweah River will be used to divert water into the reservoir by gravity.

4.3. RESERVOIR CONSTRUCTION

4.3.1. APPROACH

The proposed Reservoir would occupy a surface area of approximately 130 acres, have an average water depth of 60 to 80 feet, and would have storage capacity of approximately 4,600

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acre-feet (Figures 3 and 12). Final side slopes will be approximately 3:1, horizontal: vertical (H:V), to maximize stability and minimize bank erosion from wind, water, and waves. The upper portions of the Reservoir slopes for several feet above and below the full Reservoir water level will be covered with suitable riprap from natural stone sources or processed construction concrete debris to prevent wave action from eroding the surface.

4.3.2. EXCAVATION

Over the estimated approximate 15- to 23-year excavation phase, excavation is expected to proceed at annual rates of up to approximately 920,000 gross tons per year of silts, sands, and gravels, although this rate will likely vary in any given year. The excavation equipment, the material processing plant and associated settling pond would be located within the Reservoir perimeter as shown in Figure 13. Different areas of the excavation bottom would be lowered in stages and the process equipment relocated as appropriate. The excavated materials would be processed to produce a specified range of granular construction materials and sold. The work would be done by WCA. WCA would also receive, stockpile, and recycle concrete construction debris materials.

During the initial excavation and material processing stage, an impermeable slurry wall will be constructed around the exaction area to limit the amount of groundwater flow into the excavation as excavation progresses below the water table.

The WCA excavation phase (Figure 13) would include the following key facilities:

- A security fence that surrounds the excavation and eventual Reservoir area.
- A controlled access gate along the west side of the excavation area.
- A scale hose near the entrance gate to provide for weighing recycle materials coming into the site and construction materials being shipped from the site.
- A haul truck unloading and loading area.
- Portable crusher and recycle plant.
- Portable diesel fuel tank for onsite equipment (4,000 gallon).
- An aggregated production (wash/screen) plant.
- A stockpile area, or areas.
- A slurry wall.
- A settling pond for clarifying/recycling process and wash water for reuse.

As shown on Figure 13 the excavations would occur within the footprint of the total area and be expanded and deepened over time. The initial excavation area shown in Figures 13 and 14, is approximately sufficient for a 6-month supply of processed material. Typically, the side slopes of the excavation will be 1.5 to 1 (Horizontal: Vertical). It should be noted that the layout and facilities shown on the figure are for illustrative purpose and WCA will refine and adjust these as necessary at the start of the excavation program, keeping all the operations within the excavation footprint.

During excavation phase, the area would be dewatered, as needed, by a series of wells constructed within the excavation area to draw down the water table to below the excavation floor. Seepage calculations (Attachment D) indicate these extraction rates would initially be minimal and increase to their maximum as the excavation is deepened to the maximum depth, i.e.

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- Initial rate: 0 gpm
- Final rate: approximately 220 gpm

The water extracted to dewater the excavation would be pumped to the northern edge of the excavation and re-injected into a gravel fill infiltration gallery along and outside of the northern border of the slurry wall as shown on Figures 3, 13 and 14. This groundwater pumping would therefore not result in a consumptive loss of water.

The slurry wall will be designed by a qualified professional and constructed by a qualified contractor with experience in installing similar facilities. Construction would include the following facilities:

- A perimeter access road that would also serve as a leveling surface for the construction of the slurry wall. The road would vary in width from approximately 30 to 50 feet and be built on fill up to 8 foot in height.
- An approximately 60- to 80-foot-deep slurry wall surrounding the excavation/Reservoir area. Its actual depth will be determined during design and verified during construction based on subsurface information, to provide the required reduction in groundwater inflow. As shown on Figure 15, the slurry wall would be constructed through the perimeter road and capped off with a durable gravel layer.
- An approximately 5-foot-deep water infiltration trench along the northern border of the ultimate Reservoir area (Figures 15 and 16).

It is anticipated construction would take approximately 6 months and would include the following on-site facilities as shown on Figure 13. After completion of the slurry wall these facilities would be demobilized from the site:

- Vehicle and equipment parking areas.
- A fill material stockpile area.
- Equipment storage area.
- A bentonite slurry mixing pond (see further discussion below on the slurry wall construction activities).
- A slurry wall backfill mixing area that would be moved along with the construction of the slurry wall, so it is always adjacent to the segment being excavated.

The general sequence of slurry wall construction activities would include:

- Surface clearing, grading, and filling to create a sufficiently long section of the perimeter road.
- Excavation of the slurry wall trench (Figure 15) through the road which also provides a relatively level surface to contain the slurry in the excavation. The trench is first excavated to its full depth and then extended in length.
- Filling the trench with a bentonite slurry (bentonite clay and water mix) to support the sides of the excavation and prevent them from collapsing. The bentonite slurry is mixed in the above referenced bentonite slurry mix pond and pumped by pipeline into the excavated trench.
- The excavated soils from the trench are placed in an adjacent prepared slurry wall backfill mixing area for use in preparing the backfill, or if unsuitable for hauling the soil back to the WCA operations for processing as appropriate. The crushed concrete from offsite recycling may also be used as final riprap protection on the Reservoir slopes.

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- As the trench is extended in length, backfilling is commenced. This is accomplished by first preparing the backfill material which typically includes granular soils mixed in with bentonite and water to create a low permeability material in the slurry wall backfill mixing area. Either suitable durable excavated granular material will be used, or suitable material will be obtained from the WCA operations or imported from offsite.
- Once mixed, the backfill is pushed into the trench by a dozer, or equivalent, from the narrow end, opposite to the end of the trench that is still being excavated. The backfill material displaces the bentonite slurry in the trench and eventually settles and forms a low permeability wall. The ultimate length of the slurry wall is approximately 13,400 feet and its width is typically 3 feet.
- As the wall is completed and gravel cap is placed over the top of the backfilled trench, it will form part of the perimeter road as shown on Figure 15.
- A road safety berm will also be constructed along the inside of the road facing the excavation area.
- As the excavation of the reservoir is deepened an access ramp as shown on Figure 16 will be constructed in the excavated slope to provide for equipment access.

It should be noted the above discussion is for illustration purposes and actual construction techniques will vary based on the approved means and methods the contractor selects, and possible future technology advances in slurry wall construction.

The longitudinal section through the initial and final excavation is shown on Figure 14. The excavation configuration is relatively shallow compared to its length (horizontal to vertical dimensions are of the order of 100 to 1).

The material balance is as follows:

- Excavated to a 1.5 to 1 slope: 16.4 million tons (11,050,000 cy)
- Use of excavated materials:
  - Exported as product: 11.5 million tons
  - Use for 3 to 1 fill: 2.4 million tons (based on a 75% usability factor)
  - Use for road construction 0.1 million tons
  - Other uses 2.5 million tons

Compared to the above volumes the volume of the slurry wall is much less, at approximately 112,000 cy (0.2 million tons).

4.3.3. RESERVOIR

Construction of the Reservoir would be initiated during the final stages of the excavation and material processing, or if necessary, at a later stage. It would include two major construction activities:

- Backfilling of the excavation slopes to flatten them from 1.5 to 1 to 3.0 to 1. This is shown on Figures 14, 15 and 16. The backfill would be of suitable materials that has both sufficient strength and is relatively free draining. It would be constructed from the bottom up in compacted layers of suitable thickness. Figure 16 shows the first layer of the backfill being placed along the east side of the excavation.

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- The second major activity would include construction of the following components (Figure 17):
  - Inflow Channel - controlled by gates
  - Electrically operated slide gates in the Inflow Channel.
  - Inflow Chute – with rip-rap erosion protection.
  - Energy Dissipation Pool - Based upon the drilling logs, it is expected bedrock will be encountered at the proposed final elevation of the Inflow Chute. However, if the excavation does not get down to bedrock, installation of an energy dissipation pool at the base of the Inflow Chute would prevent potential scouring of the excavation slope by water entering the Reservoir.
  - Floating Barge Pump and Discharge Pipeline to deliver into the Kaweah River upstream of the existing McKay Point Structures.
  - Above-Ground Diesel Tank, Generators and Generator Building.
  - Outflow Channel into the St. Johns River.
  - Electrically Operated Weir for the Outflow Channel.
  - Supervisory Control and Data Acquisition (SCADA) equipment would be used to monitor Reservoir levels and conditions, and to operate the Inflow Channel, Outflow Channel, and Floating Barge Pump.

4.4. DESIGN

Conceptual level designs have been completed for the purposes of this report. These are described in the Geology and Soils Technical Study (SLR, 2021), and are at a level of detail that allows for the evaluation of the impacts and benefits associated with the proposed facilities. A brief discussion is also provided of the typical detailed design activities that would be performed before the facilities are constructed.

Conceptual designs of the various reservoir components discussed in Section 4.3.3 above are provided by Provost and Pritchard.

4.5. WATER BALANCE

4.5.1. DURING EXCAVATION

Processing will include both crushing and screening as well as washing. A total water flow rate of up to 1,500 gpm will be required for these processes. The used water will be collected and conveyed to a settling pond in the bottom of the excavation where the washed-out fine material would settle, and the clarified water would be recycled back to the processing plant with the remainder infiltrating back into groundwater under the excavation area. A much smaller amount of makeup water would be required to replace the water lost in the processing and water used for dust control at the Site. This water would be extracted from several wells located within the excavation area, the same wells that are used to dewater the excavation. Estimated makeup water requirements (or consumptive use of water during the construction period) amount to:

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- Losses in the processing: 110 AF/year
- Settling pond evaporation: 1 AF/year
- Dust control water: 30 AF/year

  Total: 141 AF/year

The processing will also result in the accumulation of fine silt which collects in the bottom of the settling pond, some of which may be used as a soil amendment onsite in association with revegetation activities, and in construction of safety and slope stabilization berms.

During excavation the groundwater extracted to maintain dry conditions would be pumped back into the infiltration trench so would not represent a consumptive use.

4.5.2. DURING RESERVOIR OPERATIONS

Water balance analyses have been performed to assess how the Reservoir would typically be operated and how much consumptive use is associated with these operations. Water loss would occur form:

- Evaporative loss from the moist surface of the Reservoir when it is maintained in an empty condition.
- Evaporative loss from the Reservoirs surface when it is full, or partially full.

Estimated consumptive use during a year when the reservoir is operating is approximately 200 AF. During years when the reservoir is not used, net evaporation losses range from insignificant for the case where the Reservoir is maintained empty by continuous pumping of the inflowing groundwater into the infiltration trench, to approximately 340 AF for the case when the Reservoir is maintained in a filled condition, thus saving the pumping energy consumption.

4.6. ANTICIPATED RESERVOIR OPERATIONS

4.6.1. INFLOW CHANNEL MANAGEMENT

The Inflow and Outflow Channels will be constructed perpendicular to the Kaweah and St. Johns Rivers (Figures 3 and 17). The Inflow Channel will provide flow into the Reservoir via a reinforced concrete control structure. The control structure would include an approach apron, reinforced concrete floor, flow/level control gates, walls, and a deck on top of the structure. The existing check structures downstream of McKay Point and the proposed inlet gates would control the flow rate into the Reservoir (Provost and Pritchard, 2014).

To divert river water into the Reservoir, when the river water level is higher than that of the Reservoir, the Electrically Operated Weir on the Inflow Channel would be opened. Water would flow by gravity into the Reservoir up to a maximum flow capacity of up to 3,500 cfs and an average of approximately 2,400 cfs as the Reservoir fills up. Upon achieving water level equilibrium between Reservoir and river, the Electrically Operated Weir would be closed. As the level of the river recedes, the Electrically Operated Weir would serve to hold water in the Reservoir.

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4.6.2. OUTFLOW CHANNEL MANAGEMENT

Gravity-Flow Water Delivery into The St. Johns River and Kaweah River

The gravity Outflow Channel for the Reservoir is located downstream of the St. John's check structure (Figures 3 and 17). The discharge capacity of the outlet is currently estimated to be approximately 900 cubic feet per second. The outlet could gravity drain up to approximately 1,100-acre feet of the Reservoir into the St. Johns River. A proposed floating pump would empty the remaining 3,500 acre-feet stored in the Reservoir. Discharge capacity of the floating pump is currently estimated to be 160 cubic feet per second and would discharge upstream of McKay's Point allowing for diversions into either the St. Johns or the Lower Kaweah River (Provost and Pritchard, 2014).

When the St. Johns River water level is lower than that of the Reservoir, lowering the Electrically Operated Weir on the Outflow Channel would deliver water by gravity flow into the St. Johns River up to a maximum flow capacity of 900 cfs. The average flow rate will be approximately 350 cfs because the flow rate would reduce gradually to zero as the level of the Reservoir approaches the level of the Outflow Channel.

The Outflow Channel will include a riprap or concrete apron, constructed across the riverbed of the St. Johns River when dry. This apron will prevent the potential scouring effects of the water entering the river.

The Inflow Channel could also be used as an Outflow Channel to deliver releases to the Kaweah River. It also includes riprap protection in the river. When the Kaweah River water level is lower than that of the Reservoir, lowering the Electrically Operated Weir on the Inflow Channel would deliver water by gravity flow into the Kaweah River at a flow capacity of 500 cfs (the Inflow Channel could be used for inflow or outflow). The average flow rate of return will approximate 200 cfs because the flow rate would reduce gradually to zero as the level of the Reservoir approaches the level of the Inflow Channel.

Water delivery in this manner is limited by the amount of water being stored at a level higher than that of the Inflow Channel (i.e., approximately 15 feet of additional storage). Once the level of the Reservoir falls below that of the Inflow Channel, the Floating Barge Pump will be used.

Pumped Water Delivery into The St. Johns and Lower Kaweah River

To release water to the St. Johns River or the Lower Kaweah River when the river water levels are higher than that of the Reservoir, the Floating Barge Pump will pump water from the Reservoir, via the Floating Barge Pump Discharge, into the Kaweah River, upstream of the McKay Point Structure.

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4.6.3. RESEVOIR OPERATIONS

The Reservoir would be operated in one of the following modes:

- *Water Conservation Mode* during which excess water would be stored in the Reservoir for later release downstream for irrigation use or groundwater recharge.
- *Flood Control Mode* during which the Reservoir would be used to store flood peaks to alleviate downstream flood damage.
- *Dual Use Mode* during which the Reservoir would be operated either for conservation or flood control.

From mid-April through the end of October, the Reservoir would be in *Water Conservation Mode* for water supply re-regulation. It is anticipated that the Reservoir would fill for the final time with flood water or otherwise storable Owner entitlement. Before the end of the irrigation season the Reservoir would be emptied to meet Owner irrigation demand and would remain empty for the upcoming flood season.

From the beginning of November to the end of January the Reservoir would be in *Flood Control Mode*. Flood peaks resulting from Terminus dam release and flood flows in the unregulated Dry Creek which exceed a stipulated flow rate would be diverted into the Reservoir to decrease downstream flood flows. Further discussion of this control mode is provided in Section 4.6.5 below.

From early February through mid-April approximately, the Reservoir would be in a *Dual Use Mode* which involves the overlapping of two operational drivers: *Flood Control* and Water *Conservation Modes*. During this period the Reservoir would be filled based on the availability of refused floodwater and the need to have an empty Reservoir for flood mitigation given forecasted weather conditions.

The Reservoir could be filled in a few days, depending on the flow in the Kaweah River and would decrease the peak flood flows. The quickest the Reservoir could be completely dewatered would be in approximately 12 days.

4.6.4. WATER SUPPLY BENEFITS (*CONSERVATION MODE* OPERATION)

Tulare Irrigation District (TID) has established a water balance model that simulates the irrigation water system from the outflow from Terminus Dam and Dry Creek down to the spill areas Cross Creek at Highway 43 into Tulare Lake, including supplies from, and exchanges with the Central Valley Project (CVP) and the Friant-Kern Canal, and the demands of the TID and the Consolidated Peoples Ditch Company (CPDC) and the Visalia and Kaweah Water Company (VKWC). The model incorporates the Reservoir operation. This model has been used to illustrate Reservoir operations for the climatic conditions observed for ten years from 2010 to 2019. The results of these simulations are shown in Figures 18A through 18E, and the associated agricultural water gains are summarized in Table 5[2]. These results indicate that the Reservoir benefits occur when the mean annul flow conditions exceed approximately 50% of the long-term mean annual flow, or in 6 out of the 11 years simulated. In these years, it would have benefited agencies to put Kaweah

[2] Note that the year 2017-18 is not plotted in the Figure 18 series since the additional water provided is very small.

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water into the Reservoir to be able to take Central Valley Project (CVP) water during events in which Owners' delivery systems were at capacity due to a combination of Kaweah and CVP water and there was surplus CVP water available which had to be refused to avoid additional spill on the Kaweah system.

As shown on Figure 18A for example, the solid red line indicates the period of the *Flood Control Mode*, the dashed red line indicates the duration of the *Dual Use Mode,* and the remaining period corresponds to the *Conservation Mode*. As noted from this figure there were no diversions for flood control purposes. During the *Dual Use* and *Conservation Mode* periods water was transferred into the Reservoir in the April and May, and smaller amounts in June and August as indicated by the green dashed line. This stored water would have been used in May and again in July and August as indicated by the dotted blue line. The corresponding Reservoir volumes are indicated by the solid blue line

TABLE 5 SUMMARY OF ANNUAL AGRICULTURAL BENEFITS

Year	Annual Precipitation at Terminus Reservoir		Annual Runoff of Kaweah River at McKay Point		Agricultural Benefit	
	Inches	% Of Long-Term Mean	Acre Feet	% Of Long-Term Mean	Additional Water Provided for D/S Use (AF)	Number Of Major Water Supply Events
2009-10	18.96	127%	454,670	122%	7,092	2
2010-11	22.38	150%	746,509	201%	6,910	2
2011-12	12.23	82%	200,737	54%	4,600	1
2012-13	6.77	45%	99,523	27%	-	
2013-14	6.15	41%	52,893	14%	-	
2014-15	8.97	60%	43,813	12%	-	
2015-16	18.39	123%	287,178	77%	-	
2016-17	19.89	133%	922,247	248%	5,842	1
2017-18	8.93	60%	202,334	54%	61	1
2018-19	17.33	116%	631,189	170%	11,445	2
AVERAGE ANNUAL	14.94	100%	371,790	371,790	3,595	1.5

The benefits of the *Conservation Mode* operations are expected to increase for climate change scenarios. While the total annual runoff changes are minor (a reduction of up to 5%, Section 2.3.2) the higher seasonal flows are projected to occur earlier in the year likely resulting in increased flood releases from Terminus Dam. With the Reservoir in place these earlier releases could be stored and then used to increase the CVP water by a like amount later in the year. Furthermore, use of the Reservoir will more critical since overall, less runoff will be available, making it more important to reduce any spillage of unused water by storing it in the Reservoir.

4.6.5. FLOOD MANAGEMENT BENEFITS (*FLOOD CONTROL MODE* OPERATIONS)

The Terminus Dam and Kaweah Project is operated so that flows do not exceed 5,500 cfs in the Kaweah at McKay Point to protect the downstream municipalities, rural communities, and agricultural lands in the Tulare Lakebed from flood damage. (USACOE, Revised 2005). Dry Creek is the major uncontrolled tributary to the Kaweah River below Terminus Dam and upstream of the Reservoir. This tributary can produce high magnitude flows that require rapid release changes from the dam if the impact is to be reduced, since there are no flood control measures in place for these flows.

Flood attenuation benefits were assessed by considering the three largest instantaneous flood peak flows that were recorded on Dry Creek between 1960 and 1997. As shown on Table 6, these include:

- December 6, 1966 (peak flow = 14,500 cfs).
- January 25, 1969 (6,070 cfs).
- January 2, 1997 (4,380 cfs).

Operations of Terminus Dam allowed for low release rates on these flood days to compensate for the higher Dry Creek flows as shown by the measured average daily flows in Table 6 (column 3). However even with these reduced discharges the flood peak flows in the Kaweah River at McKay point were still elevated as shown in the 4th column of Table 6, i.e., 4,508, 6,646 and 15,549 cfs respectively. In extremely wet years such as 2017, it would be desirable to have the Reservoir absorb the Dry Creek flows so that Terminus can keep releasing as opposed to reducing releases from Terminus, thereby keeping storage available for flood inflow to Terminus (Watermaster of the Kaweah Delta).

Flood routing simulations were conducted to assess how much the Reservoir, had it been in pace, could have reduced these flood peaks. For these simulations it was assumed that once the Kaweah River at McKay Point flows exceed 2,500 cfs, the excess flows up to the maximum capacity of the inlet to the Reservoir (3,500 cfs[3]) are diverted into the Reservoir. As shown by the results listed in Table 6 (column 5), it would have been possible to reduce the flows to below approximately 3,000 cfs in the river, except for the very large December 1966 flood. Even for this event the flood peak would have been reduced to 12,472 cfs, a reduction of 3,068 cfs.

Figure 19 shows which day of the year the measured annual maximum flood peaks occurred in Dry Creek, and these can be considered to cover the periods during which future large floods may occur and during which the Reservoir could potentially be used for flood control purposes. The solid lines in the chart indicate the approximate starts and finishes to the *Flood Control Mode* period that could be considered. These periods would include:

- November 1 would be the start of the flood control operations during which the Reservoir would exclusively be used for flood control purposes and emptied after each flood storage event in anticipation of the next flood event. The released water could be used for recharge in a variety of basins around TID ranging from several acres to 150 acres in size.
- January 31 would be considered the end of the *Flood Control Mode* period.

[3] This assumes the gates will all be opened to provide for the maximum inflow capacity during a flood event. During normal operations inflow rates would be less.

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- February 1 through April 15 would be considered a *Dual Use Mode* period during which water from a projected large flood would be stored in the Reservoir, but after the flood the water would only be released in accordance the which agricultural demand as discussed in Section 4.6.4.

TABLE 6: KAWEAH RIVER AT MCKAY POINT – ANNUAL FLOWS						
HISTORIC FLOOD FLOW DATA				SIMULATED EFFECT OF STORING FLOOD FLOWS ABOVE 2,500 CFS[4] IN RESERVOIR		
DATE	MEASURED INSTANTANEOUS PEAK DRY CREEK FLOW RATE (CFS)	MEASURED AVERAGE SAME DAY DAILY OUTFLOW FROM TERMINUS DAM (CFS)[5]	CALCULATED MAXIMUM INSTANTANEOUS PEAK FLOW IN KAWEAH AT McKAY POINT (CFS)[6]	REDUCED FLOOD FLOWS TO DOWNSTREAM OF RESERVOIR (CFS)[7]	REDUCTION IN KAWEAH RIVER AT McKAY POINT FLOW BY STORING FLOOD WATER IN THE RESERVOIR (CFS)	RESERVOIR STORAGE UNTILIZED (AF)
December 6, 1966	14,500	1,040	15,540	12,472	3,068[8]	4,600
January 25, 1969	6,070	576	6,646	3,146	3,500	2,429
January 2, 1997	4,380	128	4,508	2,628	1,880	939

The flood routing was repeated for the estimated 10-year to 100-year flood peaks at McKay Point developed by FEMA and discussed in Section 3.5 above. The results are provided in Table 7 showing the reductions that could be achieved. It is evident that the Reservoir could reduce flood peaks to below the target 5,500 cfs for flood events up to approximately the one in 50-year event. For larger floods, it would still be possible to reduce the flood peaks, however it would not be possible to meet the 5,500 cfs target at McKay Point.

In conclusion the Reservoir would have the ability to capture some of the floodwater from large floods in Dry Creek, where it would be held until it can be safely returned to the Kaweah and St. Johns rivers for direct use or recharge. The Reservoir has the capacity to reduce flood peak up to approximately the 50-year return period event to below the Target 5,5000 cfs. There would still be a benefit during still larger floods in reducing the peak flow rates.

[4] The 2,500 cfs has been set as a threshold above which water is diverted into the Reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.
[5] Based on the difference between the measured average daily flows at "Dry Creek" from "Total Kaweah River at McKay Point" as recorded in the Water Master Reports.
[6] Sum of the measured instantaneous Dry Creek flow and the average daily outflow from the Terminus Dam
[7] Based on flood routing through the Reservoir.
[8] It was not possible to reduce the flood peak by the capacity of the inlet structure because the reservoir was filled with flood water before the actual peak river flow occurred.

TABLE 7 SIMULATED EFFECT OF STORING FLOOD FLOWS ABOVE 2,500 CFS[9] IN RESERVOIR				
DATE	ESTIMATED MAXIMUM INSTANTANEOUS PEAK FLOW IN KAWEAH AT McKAY POINT (CFS)[10]	REDUCED FLOOD FLOWS TO DOWNSTREAM OF RESERVOIR (CFS)	REDUCTION IN KAWEAH RIVER AT McKAY POINT FLOW BY STORING FLOOD WATER IN THE RESERVOIR (CFS)	RESERVOIR STORAGE UNTILIZED (AF)
100-year	18,456	16,706	1,750	4,600
50-year	8,725	5,225	3,500	3,998
10-year	4,400	2,500	1,900	955

Since climate change is expected to result in increased intensities of flood events, more frequent flood events, and earlier arrival of high winter flows. Under these conditions the Reservoir would provide for increased flood control benefits. For example, as discussed in Section 2.3.2, flood peaks for the current frequencies are expected to occur almost twice as often. This would mean that instead of the Reservoir contribution to flood reductions for storms exceeding the 10-year event, it would be more useful and would be able to provide for reductions in flood flows for storms exceeding the 5-year event. This means that over a Project life of 50-year say, instead of the Reservoir being used approximately 5 times, it would be used approximately 10 times.

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[9] The 3,500 cfs has been set as a threshold above which water is diverted into the Reservoir. During floods in Dry Creek of this magnitude the flood peaks could be potentially further reduced if necessary.

[10] Based on FEMA estimates

5. POTENTIAL IMPACTS

5.1. CEQA SIGNIFICANCE CRITERIA

Hydrology and water quality impacts are described in subsequent sections based on an evaluation of existing Site surface and groundwater hydrology and water quality conditions, and consideration of Project water consumption and potential changes to surface and groundwater hydrology and quality due to Project ground disturbance and land uses. A hydrology or water quality impact is considered significant if it would result in any of the following, adapted from the CEQA Guidelines, Appendix G:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater water quality.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

c) Substantially alter the existing drainage pattern of the Site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

d) Substantially alter the existing drainage pattern of the Site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-Site.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems, cause flooding on- /or off-Site, or provide substantial additional sources of polluted runoff.

f) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

g) Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding because of the failure of a levee or dam; or

i) Inundation by seiche, tsunami, or mudflow.

Regarding item “f”, the Project does not include the construction of housing. As a result, this criterion has been eliminated from further consideration.

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5.2. IMPACT HWQ 1 (CRITERION "a"): THE PROJECT COULD RESULT IN IMPACTS TO WATER QUALITY

The potential for water quality impacts to be caused by the Project due to the use and storage of fuels and chemicals, and possibly due to runoff from the Project Area, is evaluated below.

Any unacceptable impacts due to suspended sediment entrainment in surface water would be prevented by the appropriate engineering measures and regulated under the State Water Resources Control Board's (SWRCB's) General Storm Water Permit. These measures are discussed further below.

5.2.1. USE OF FUELS AND OTHER CHEMICALS FOR EQUIPMENT OPERATION AND MAINTENANCE

The use of hazardous materials during Reservoir construction and operation would mainly include fuels, lubricants, and fluids associated with vehicles and equipment. Hazardous materials used as part of construction operations on onsite equipment and vehicles would primarily include fuels and lubricants. Any spill from vehicles or equipment would likely be small and would be promptly and easily cleaned up and disposed of in accordance with State and County regulations.

During Reservoir excavation and construction, hazardous materials will not be stored onsite. Only minor maintenance of equipment and vehicles would be conducted onsite, and vehicles would be fueled by a mobile fuel truck. These activities would be done within the excavation area (Figure 13) where the receipt, storage, handling, use and disposition of these materials in compliance with the requirements of the approved Business Plan, Hazardous Materials Inventory.

Construction will include the installation of an above-ground diesel storage tank, diesel generators, and a generator building near the Inflow Channel. Except for the fluids stored in or on the vehicles and equipment, and, during operations, one AST containing diesel fuel (see below), hazardous materials will not be stored within the Project site. The AST will be used to operate a floating pump in connection with Reservoir operations and will not be used for fueling of vehicles or equipment. Therefore, dispenser-related spillage will not occur

The AST will be dual walled for leak protection. Filling of the AST will only occur in a designated area underlain by concrete paving or a protected flexible membrane liner to facilitate spill cleanup and to inhibit migration of fuel contaminants into the soil column. The Diesel AST will be managed in accordance with a Spill Prevention, Control and Countermeasure (SPCC) Plan. Storage, transfer, spill avoidance, and spill response procedures will be documented in the SPCC Plan.

The AST will not be in an area predicted to be inundated by a 100-year flood, as described in subsequent sections, and as shown on Figure 11. Therefore, damage of the AST because of flooding is not anticipated.

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5.2.2. STORM WATER RUNOFF

The SWRCB (Board) has jurisdiction throughout California. Created by the State Legislature in 1967, the Board protects water quality by setting statewide policy, coordinating, and supporting the Regional Water Board efforts, and reviewing petitions that contest Regional Board actions. Nine Regional Water Quality Control Boards exercise rule making and regulatory activities by basins. Tulare County falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB). As such, the Project is subject to the requirements of the *Water Quality Control Plan for the Tulare Lake Basin*, revised January 2004.

The SWRCB issued a statewide Industrial General Storm Water Permit (Permit) that applies to all industrial storm water discharges. The SWRCB adopted a new Permit that took effect July 1, 2020.

The Owners will obtain coverage under the Permit, as required. Storm water runoff from the Project Area would be managed through proper implementation of Best Management Practices (BMPs such as sediment and erosion control measures) as described in the Stormwater Pollution Prevention Plan (SWPPP). The primary objective of the SWPPP and BMPs is to ensure that polluted runoff, including runoff containing suspended solids and sediment, does not leave the Site and degrade other water bodies. The SWPPP will contain descriptions of aspects such as potential discharge areas, significant materials, and BMPs. BMPs also include non-structural elements such as employee training, documented operating procedures, and general housekeeping. Compliance with applicable storm water regulations will prevent impacts to water quality.

The Project is designed to divert water from the Kaweah River and store this water for later release downstream for use by irrigation water customers. The Project design incorporates engineering measures such as concrete slabs and riprap to prevent erosion and entrainment of suspended solids at the inlets and outlets to the Reservoir where higher water velocities are expected to occur. The Project will not create large areas of impermeable surfaces and will not result in increased rates of surface runoff. In fact, the Project will serve to capture rainfall, thereby reducing surface runoff compared to baseline conditions. Geologic materials exposed in the Reservoir will consist of natural sediments which do not contain deleterious materials or chemical constituents capable of degrading groundwater. Process water will not be generated or discharged to groundwater or surface water as part of the Project. Therefore, the Project is not expected to produce additional runoff, or convey pollutants to surrounding waterbodies.

During the construction phase, energy dissipaters such as sediment catchment basins or sumps, rock dams, and berms, will reduce erosion, trap sediment, and minimize the potential for off-site transport of pollutants. During the excavation phase of the construction, activities will take place inside the excavation itself, thereby preventing any runoff from these activities from entering the rivers. Operations will minimize the extent of disturbed areas. Discharges of storm water runoff from the Site will decrease. Runoff will be directed into the Reservoir or local detention areas to the extent practical.

The final side slopes for the reservoir will be protected from erosion by wind-wave action by the placement of suitable granular material including riprap to armor these surfaces. The perimeter

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road will be graded to direct runoff into the Reservoir or onsite detention areas instead of toward the rivers. Also, the road will continue to be inspected and maintained regularly. Inspections of the road condition and the status of sediment and erosion control measures will be integrated with regular required storm water inspection pursuant to the Permit.

5.2.3. DISCHARGES FROM RESERVOIR COULD CONTAIN SUSPENDED SOLIDS

The Owners may choose to fill the Reservoir during high flow conditions, which may occur in response to periods of extraordinary precipitation. High flow conditions will naturally entrain soil particles from the banks or bottom of the river. As a result, water diverted into the Reservoir may contain elevated concentrations of sediments. Releases from the Reservoir containing excessive sediments could violate the Basin Plan water quality objectives (WQOs), and adversely affect beneficial uses that are designated for the St. John River.

During the time water is stored within the Reservoir, sufficient time will be allowed for settlement of sediments to occur to assure that the discharged water will meet the WQOs with respect to suspended sediment and turbidity.

5.2.4. CONCLUSION

The Project is not expected to cause increased siltation or degrade water quality of surface waters or groundwater, or cause violations of water quality criteria. The Site will be subject to conditions of the SWPPP and SPCC Plan, including provisions for inspections, monitoring, and reporting. The Project involves creation of a Reservoir, which is a topographic depression that will reduce runoff discharges from the Site and vicinity. As a result of proper implementation of sediment and erosion control measures, the Project is not expected to exacerbate the pollutant load of St. Johns or Kaweah Rivers.

Major maintenance of the trucks and equipment will be conducted at approved facilities located outside of the Project area, both during the excavation. construction and operational phases. During the excavation and construction of the Reservoir trucks and equipment will be fueled onsite with mobile fuel trucks within the excavation area. Since the AST will be constructed, operated, and maintained in accordance with applicable regulations, the probability of an onsite spill is minimized. As a result of the factors discussed above, this analysis concludes that the Project would have a less than significant impact on water quality under criterion "a" above.

Level of Significance Before Mitigation: Less than significant
Mitigation Measures: None Required

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5.3. IMPACT HWQ2 (b): THE PROJECT COULD IMPACT GROUNDWATER SUPPLIES, GROUNDWATER LEVELS, AND/OR RECHARGE

5.3.1. SLURRY WALL INSTALLATION

As noted above, a slurry wall, installed initially during excavation of the Reservoir, will decrease the flux of groundwater between the Reservoir/excavation and surrounding aquifer. Slurry walls are underground walls made of bentonite (clay) mixtures that are installed to inhibit groundwater flow. In this case, the slurry wall would be installed around the Reservoir perimeter to decrease groundwater seepage flowing into the Reservoir during excavation and construction phases, and to keep the Reservoir in a relatively dry condition when not being used for storage. The slurry wall would be installed from elevations above the groundwater levels and extend upwards into the Reservoir's perimeter berm as needed to contain water stored in the Reservoir above groundwater levels and downwards into natural lower permeability materials as discussed in Section 4.1.

The slurry wall would be a permanent fixture of the Reservoir and would serve as an essential feature to achieve the following:

- Assist in maintaining dewatered storage capacity to receive surface water diversions.
- Keep groundwater out of the Reservoir to minimize aquifer impacts and provide maximum space to receive Kaweah River water; and
- Inhibit losses of surface water stored in the Reservoir to the surrounding aquifer when the Reservoir is full.

It is recognized that even with the slurry wall installed there will be groundwater seepage into the Reservoir from under the slurry wall when the Reservoir is empty and some leakage of stored water to groundwater when the Reservoir is full. How this seepage/leakage is managed is described in Section 4.1 and in the discussion below.

5.3.2. DRY RESERVOIR CONDITIONS

Dry reservoir conditions will exist during construction after slurry wall installation. Dry Reservoir conditions will also exist during Reservoir operations during time periods in which the Owners wish to reserve storage for anticipated dam releases or precipitation events. Under these conditions, the Owners would intend to keep groundwater out of the Reservoir.

The slurry wall will not eliminate flow of groundwater into the Reservoir when the Owners wish to keep it dry. Dewatering will still be required because the bottom of the Reservoir will be at a lower elevation than the surrounding groundwater, creating a hydraulic gradient toward the Reservoir. Therefore, some groundwater seepage into the Reservoir will occur under the slurry wall and is estimated at approximately 220 gpm when the Reservoir is being kept dry (Attachment D). This is the maximum estimated range of groundwater seepage into the Reservoir, which would occur at the end of the excavation and construction phases and is estimated to occur during the entire Reservoir operations phase when the Reservoir is kept empty. At the end of excavation and construction, the bottom of the Reservoir will be approximately 60 - 75 feet below ground surface,

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the maximum amount of pit wall will be exposed, and the maximum amount of groundwater head surrounding the Reservoir will be realized.

Reservoir operations do not involve storage of groundwater. Therefore, when dry Reservoir conditions are desired, seepage will be captured in a sump at a designated location within the Reservoir and will pumped back and reintroduced into the local aquifer via an infiltration trench located along the north side of the Reservoir, between the slurry wall and the adjacent CEMEX property. (Figure 12).

As stated above, groundwater in the Site vicinity generally flows toward the northwest (Schmidt, 2012). Based on this gradient, the Kaweah and St. Johns Rivers contribute to groundwater recharge for much of the time, and together with groundwater inflow from the east appear to be primary factors in driving the direction of groundwater flow.

After the slurry wall is installed, the general direction of groundwater flow is not expected to change since it is driven by recharge from the east and from the river channels. This northwest flow is expected to flow around the slurry wall to the north and south. This is not expected to significantly inhibit groundwater flow to areas west or north (downgradient) of the Site because the abundant coarse-grained soils of the alluvium and the fractured rock of the aquifer in the area is expected to accommodate flow around (to the north and south) and underneath the Site (Attachment A).

Groundwater is not expected to significantly mound (accumulate vertically) on the upgradient side of the Site or cause a “shadow” of depressed groundwater levels downgradient of the Site. Parcels located adjacent west of the Site will continue to receive recharge as groundwater flows around the slurry wall.

As stated above, seepage into the excavation will be collected and infiltrated back into to the aquifer, so the seepage will not constitute a loss and is not expected to affect groundwater supplies or levels.

The St. Johns and Kaweah Rivers create a significant hydraulic divide in the groundwater system. In general, any changes occurring on one side of a hydraulic divide are unlikely to affect conditions on the other side. Therefore, it is unlikely that potential groundwater related impacts, if any, would occur at sites located south of the St. Johns River or east of the Kaweah River. Because of the hydraulic divide and because the Project will not affect the fractured rock groundwater unit, groundwater levels in wells south of the Kaweah River such as the Lemon Cove municipal supply well are not expected to be affected by the Project.

The Reservoir, when pumped out, is not expected to impact the Minimum Threshold and Measurable Objective groundwater levels that have been established for Well KSB-2822 (also referred to as 18S27E05J001M), located between the St. Johns and Kaweah Rivers – Figure 9). The modeled changes to the groundwater levels around the outside of the slurry wall are provided in Attachment D which indicates these are insignificant, i.e., less than 3 to 3 feet.

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5.3.3. OPERATING RESERVOIR CONDITIONS

An estimated approximately 200 AF/yr. ((approximately 124 gpm as a continuous flow) of net evaporation will occur during a typical year of operation during which the Reservoir remains full or partially full, during the months of May through September and for short periods of days or weeks in the November through January period when used for flood control (se Section 4.5.2). This compares to the additional annual average 3,129 AF of additional agricultural water that would be made available by operating the Reservoir (Section 4.6.3). This evaporation rate amounts to 6% of the added water generated.

On a basin wide scale, the evaporation rate is minimal (less than 0.02%) compared to the 862,000 AF (699,000 AF of which is groundwater) delivered annually for irrigation purposes in the district (Fugro, 2007). Furthermore, since the Reservoir would be frequently emptied (likely 2 or more times per year) this would prevent any buildup of dissolved constituent that may be caused by evaporative concentration.

It is not anticipated that the reservoir will remain in a full condition for an entire year; however, if for some reason this were to occur, the annual evaporative loss is expected to be approximately 340 AF (Section 4.5.2).

During Reservoir operations, when the Reservoir is filled with diverted surface water, the water surface elevation will be up to approximately 460 feet elevation which exceeds the groundwater elevation at several locations within the Reservoir footprint. Although the slurry wall will have been installed to inhibit groundwater flux into and out of the Reservoir, aquifer recharge will occur under full Reservoir conditions because the Reservoir level will be higher than the surrounding groundwater. The recharge rate is expected to be minor due to the presence of the low-permeability slurry wall. The recharge volume depends on how much time the Reservoir water level remains above the groundwater levels in the vicinity. This recharge volume is not further evaluated because it is small and, in any event, constitutes a source of groundwater recharge no more than the recharge from the rivers.

5.3.4. CONSUMPTION WATER USE DURING EXCAVATION AND CONSTRUCTION

During excavation, the amount of water consumption will be relatively minor. As discussed in Section 4.1 it is estimated be approximately 141 AF/year.

Water for these purposes would be obtained from wells installed in the bottom of the excavation. These wells would also be used for maintaining the excavation in a dry enough state for the excavation and processing activities. These consumptive uses from the existing source constitute a minimal impact over baseline conditions. These consumptive uses are not expected to affect groundwater levels or supplies in the Site vicinity.

5.3.5. CONCLUSIONS

Negligible losses to groundwater are anticipated. The slurry wall will be in place, which will form a flow barrier in the alluvial groundwater system. As a result, in the Site area, groundwater flow

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directions will change as groundwater flows around the slurry wall through the alluvium and fractured rocks that surround the Site. Groundwater that seeps into the excavation through the slurry wall or through the bottom of the excavation will be collected and re-infiltrated back to the aquifer using infiltration drains. The infiltration gallery will be located north of the excavation, which will minimize changes to the current direction of groundwater flow in this area. Because recharge would not be significantly interrupted and offsite groundwater elevations are not expected to change noticeably, the excavation phase would therefore result in less than significant impacts under criterion “b” above.

Reservoir operations are expected to result in less impact to groundwater than the excavation and construction phases described above. The slurry wall will reduce impacts to groundwater supply by inhibiting groundwater from entering the Reservoir, where it would be subjected to evaporation. Seepage into the Reservoir through the slurry wall during dry-Reservoir periods will be returned to the aquifer. Reservoir operations impacts therefore are considered less than significant under criterion “b”.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.4. IMPACT HWQ3 (c): CHANGES TO SITE OR AREA DRAINAGE PATTERNS COULD RESULT IN EROSION OR SILTATION IMPACTS

This section describes an evaluation of the potential for drainage pattern changes to cause erosion or siltation impacts. Drainage system changes associated with the Project include installation and use of the Inlet and Outlet Channel. As described above, the Project involves creation of a topographic depression that will capture precipitation and some storm water runoff. However, there are no identifiable creeks or water bodies that will be disturbed by the Project. The Project will not involve placing structures in the St. Johns or Kaweah River channels. The only changes to the river channels will be placement of riprap at the Inflow and Outflow Channels, and construction of the Inflow and Outflow Channels. The riprap will be placed below the elevation of the surrounding channel, and the Inflow/Outflow Channels will be set back from the main river channels; these structures are designed to avoid impedance of river flows.

To evaluate scouring, SLR reviewed historical aerial photos. Previous aerial photos from the years 1954, 1956, 1969, 1974, 1984, 1989, and 1994 were reviewed to determine if major scouring or changes in morphology of the Kaweah and St. Johns Rivers have historically occurred near the Site. Based on review of these aerial photographs, no significant changes have occurred since the 1954 photograph. Terminus Dam, constructed in 1962, regulates flows and flooding and rapid changes in river morphology and scouring will therefore be minimized.

The potential for scouring to occur during delivery of water from Reservoir to the St. Johns and Kaweah Rivers will be minimized. The Outflow and Inflow Channels would include a riprap and concrete aprons, constructed across the riverbed of the Kaweah River (Figure 3). These aprons will prevent the potential scouring effects of the water being delivered to the rivers. In addition, the aprons will be installed so they do not protrude into the stream, so that they will not affect river flow rates or patterns.

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After a flood storage event in the Reservoir, water stored in the upper portion of the Reservoir would be released at flows ranging up to 900 cfs. The erosion protection measured installed in the Reservoir will prevent erosion in the outflow structure and the 900 cfs flow rate is significantly lower than the prior natural flood flows that have occurred in the rive channels and will not result in any changes to the natural erosion patterns in these.

To release water to the St. Johns River or the Kaweah River when the river water levels are higher than that of the Reservoir, a Floating Barge Pump (electrically powered) will pump water from the Reservoir into the Kaweah River, upstream of the McKay Point Structure. The Floating Barge Pump, or series of pumps, would have an approximate maximum flow rate of 160 cfs. Erosion control features will be constructed in the Floating Barge Pump discharge area so that the channel of the Kaweah River is not scoured.

In addition to review of aerial photos, SLR conducted sediment transport modeling using a computer application. The HEC-RAS computer application was utilized to evaluate the potential for sediment transport in the channels of the Kaweah River east of McKay Point, St. Johns River, and the Lower Kaweah River. The potential for sediment transport is dependent on the grain size distribution of channel materials, riverbed gradient, flow rate, and water flow regime. Further details regarding this evaluation are provided in Attachment C.

The sediment transport analysis was conducted based on the average maximum monthly flow of 1,500 cfs. This value consists of the highest average monthly flow rate measured between 2001 and 2007 documented in annual Watermaster reports (Watermaster, 2007). In other words, the flow rate used is considered the higher range of typical flow rates that occur in the Kaweah River in the Site vicinity.

Results of the HEC-RAS sediment transport analysis are presented in Attachment C. These results include profile views of the riverbeds, which illustrate a minimal potential for scour and transport at the flow rate applied.

Based on the results of the analyses the Project is not anticipated to alter the natural flow rates or conditions in the river. During Reservoir operations, flow rates in the St. Johns and Kaweah Rivers will remain within the existing range of typical flow rates that are currently managed through outflows of Terminus Dam. Use of the Reservoir for flood storage may cause flow rates in the Kaweah and St. Johns Rivers to decrease during periods of high precipitation, thereby actually reducing the scour potential.

Aerial photograph review and HEC-RAS sediment transport evaluation both suggest that, under typical conditions, there is insignificant potential for sediment transport in the river channels along the Site southern boundary. Terminus Dam is used extensively to manage flow rates in the rivers, and to avoid flow rates that would result in extensive scouring. The Project does not involve features or facilities that will change these conditions and may reduce flow rates during periods of extraordinary precipitation by providing flood storage. Based on these factors, siltation and erosion impacts associated with the Project are less than significant with respect to criterion “c” above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

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5.5. IMPACT HWQ5 (d): CHANGES TO ON-SITE DRAINAGE PATTERNS, INCLUDING ALTERING THE COURSE OF RIVERS, OR SUBSTANTIALLY INCREASE THE RATE OR AMOUNT OF SURFACE RUNOFF, RESULTING IN FLOODING IMPACTS

Reservoir excavation and construction would not alter the course of rivers. The Project would, however, change onsite drainage patterns because construction of a topographic depression will reduce the amount of storm water runoff flowing out of the Reservoir area. Releases from the Reservoir will not cause river flows to exceed their normal flow rate range and will not cause flooding. In fact, the Reservoir will be used for flood storage, which will decrease river flow rates during periods of extraordinary precipitation. Based on these factors, the Project would not increase the potential for flooding on- or off-site and therefore would not result in significant impacts under criterion “d” above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.6. IMPACT HWQ5 (e): CREATE OR CONTRIBUTE RUNOFF WATER WHICH WOULD EXCEED THE CAPACITY OF EXISTING OR PLANNED STORMWATER DRAINAGE SYSTEMS, CAUSE FLOODING ON- OR OFF - SITE, OR PROVIDE SUBSTANTIAL ADDITIONAL SOURCES OF POLLUTED RUNOFF

Since both during the excavation and Reservoir phases the Project would store any rainfall that falls within the Project area, there would be no increases in flood flows outside of the Project area so the capacity of existing or planned stormwater drainage systems would not be affected. Since stormwater in the Project area would also be collected with either the excavation or Reservoir, there would be no offsite sources of polluted runoff. Discharges from the Reservoir for agricultural purposes would be subject to appropriate water quality standards.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.7. IMPACT HWQ4 (g): PLACE HOUSING IN 100-YEAR FLOOD HAZARD AREA, OR STRUCTURES THAT WOULD IMPEDE OR REDIRECT FLOOD FLOWS

The Federal Emergency Management Agency (FEMA) flood map for the area including the Site indicates that the eastern portion of the proposed Reservoir is located within the 100-Year Flood Hazard Zone (Figure 9). FEMA has established base flood elevations for the St. Johns and Lower Kaweah Rivers downstream of McKay Point, but not for the Kaweah River upstream of McKay Point and the portion of the proposed Reservoir within the 100-year Flood Hazard Zone. This

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situation is common because FEMA tends to apply its resources to conducting detailed flood mapping in populated areas (such as near the City of Visalia) rather than rural areas.

FEMA's work on the eastern portion of the Site was not conducted in sufficient detail to establish base flood elevations, and it follows that the accuracy of the flood hazard zone presented by FEMA could be improved if flood mapping in greater detail was conducted. Therefore, SLR conducted flood modeling for this area in greater detail to establish base flood elevations, and to delineate the 100-year flood inundation area.

The HEC-RAS hydraulic software package, released by the United States Army Corps of Engineers, was used to simulate the 100-year flood flow at the Kaweah River east of McKay Point. The flow is based upon the raised spillway at the Terminus dam. The peak flow at McKay Point is 18,220 cfs, as calculated by the United States Army Corps of Engineers. Details regarding this flood modeling are included in Attachment C.

The topographic data used for flood modeling consisted of the LiDAR survey conducted for the Tulare and Visalia basin in 2004. These topographic data were part of the same dataset used by FEMA for the flood mapping conducted downstream of McKay Point as documented in FEMA (2009). A total of 12 cross sections, spaced at a maximum of 1,000 feet apart, were created along the length of 7,600 feet east of the McKay Point junction of the Kaweah River. For purposes of model stability, cross sections were interpolated throughout the reach with sections positions at distances no larger than 75 feet apart.

SLR conducted a steady state flow analysis to calculate the based flood elevations for the peak flow of the 100-year flood for the Kaweah River east of McKay Point. The analysis was calibrated to tie into the water surface elevations calculated in the prior analyses conducted by FEMA for stretches of the St. Johns and Kaweah Rivers downstream of McKay Point.

Figure 11 presents the water surface elevations and floodway for the 100-year flood peak flow. Based on SLR's detailed flood modeling evaluation, the floodway for the 100-year flood peak flow will only encroach minimally on the proposed Reservoir footprint. Although the eastern end of proposed Reservoir footprint is in the areas subject to inundation as sated by FEMA, no significant quantities of water will be present in these areas. Therefore, since the Project is not expected to place structures in the 100-year flood hazard zone and is not expected to redirect flood flows this potential impact is considered less than significant under criterion "g".

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.8. MPACT HWQ6 (h): POTENTIAL IMPACTS OF LEVEE OR DAM FAILURE

This section considers both a levee and dam failure from a facility in the vicinity of the Project, as well as a potential failure of the Project facilities.

Levee or dam failure from a facility in the vicinity of the Project

The Terminus Dam is considered a High Hazard dam where failure or mis-operation could cause loss of human life. It has an Emergency Action Plan (EAP) which describes actions to be taken

to reduce the potential for property damage and loss of life in an area affected by the dam failure of the dam (https://nid.sec.usace.army.mil/#/dams/system/549835/summary). The EAP was last revised on September 19, 2016 and exercised (tested) on October 21, 2020.

A hypothetical failure of the Terminus Dam located upstream of the Project, likely by a dam breach, would result in a flood of released water. In the event of such a failure, the Project would not alter the extent of downstream flooding since it provides no impediment to the dam breach flood wave. Since some of the flood wave would be stored in the reservoir, the Project may slightly reduce the downstream flooding.

Workers at the Project during both the excavation and Reservoir phases would likely be exposed to flooding from a Terminus Dam failure and would need to be made aware of the EAP and be trained to comply with its requirements.

Based on the discussion above, risk associated with the unlikely scenario of a Terminus Dam failure will be minimized by the EAP. Thus, the Project would not result in significant impacts under criterion “h" above.

Potential failure of the Project facilities

The Project involves construction of a perimeter berm that may be as much as approximately 8 feet above surrounding topography in some areas. However, as described in Section 4.7, the Project only includes the placement of a berm at the edge of the predicted area to be inundated by the 100-year flood. In addition, the Project does not involve construction of housing or work areas that will be occupied on a regular basis. As described above, most of the Reservoir operations will be conducted remotely. Construction operations will also be conducted outside of the 100-year flood inundation area. Therefore, the Project is not expected to be affected by a 100-year flood.

The water elevation in the Reservoir may extend above the current natural surface elevation. Water will be withheld in some areas of the Reservoir by a berm that contains a slurry wall. The berm will be designed and constructed, to an appropriate factor of safety, to withhold the hydraulic forces necessary to store surface waters at the desired elevation. Regular inspections of the Reservoir structures and facilities, including the berm, will be conducted. Failures of berms such as the one proposed typically display early signs of an impending failure, such as slumping, appearance of seepage, or settlement, so that corrective actions will be taken by the Owners as appropriate to avoid the failure.

Even if failure occurs, the entire Reservoir volume would not flow out. A maximum of up to approximately 1,000 AF could drain from the Reservoir without pumping, compared to the total Reservoir volume of approximately 4,600 AF. In that unlikely case, the Owners would have multiple response options. The Reservoir level could be quickly lowered in a controlled fashion using the Inlet and/or Outlet Channels. Also, the McKay Point structure immediately downstream could be used to limit the extent to which river levels are raised. Similarly, the additional flow could be accommodated by multiple downstream watercourses, including the Lower Kaweah, St. Johns, and the multiple related irrigation ditches.

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Based on the discussion above, the Project is not expected to cause significant loss, injury, or death by dam or dike failure. Thus, the Project would not result in significant impacts under criterion “h" above.

Conclusion

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

5.9. IMPACT HWQ7(i): POTENTIAL IMPACTS FROM SEICHE, TSUNAMI, OR MUDFLOW

The Project is not near the coast, so it is not susceptible to inundation by a tsunami. In addition, the Project is surrounded by relatively flat topography, and calculations conducted by SLR suggest that proposed Reservoir slopes are within acceptable factors of safety. Therefore, the Site is not expected to be affected by a mudflow.

A seiche is a standing wave that can occur in small water bodies such as basins, swimming pools, and lakes. The wave can reduce water levels at one end of the water body and increase the water level on the other, like the “sloshing” of water back and forth.

The potential for seismic ground shaking to generate a seiche in the proposed Reservoir was evaluated. The risk associated with a seiche is overtopping of the Reservoir if the amplitude of the wave exceeds the freeboard included in the design by an amount large enough to generate a force that could be detrimental to the facility.

The occurrence of a seiche and the amplitude of the wave are controlled by the natural period of the Reservoir and that of the earthquake. If the two periods are similar, resonance can occur, thus amplifying the wave.

The natural period of the Reservoir can be calculated using the Merian formula assuming a rectangular basin (USNRC, 2011).

$$\mathrm{T} = \frac{2\,L}{\sqrt{gh}}$$

Where L is the length of the basin, g the acceleration of gravity (32.2 cm/sec^2), and h the depth of water. Combining a representative value of 600 ft as the average width of the basin and a depth of water h of 70 ft, the natural period of the Reservoir is estimated to be:

$$T = \frac{(2)(600)}{\sqrt{(32.2)(70)}} = 25\ s$$

This natural period is to be compared to that of the earthquake that may shake the Site. The typical range of period for strong ground motion is between 0 and 5.0 seconds, with the dominant period for the site-specific event being on the order of 0.2 second (USGS, http://geohazards.usgs.gov/hazardtool/application.php). Therefore, the difference in period between the Reservoir and the design earthquake is two orders of magnitude.

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An empirical formula is provided in HAZUS (FEMA, 2003) to estimate the peak wave height of the seiche as:

$$H = \sqrt{\frac{A}{L\,(\pi f)^2}}$$

Where H is the peak height, A is the acceleration (in g's), f is the frequency of the lake, and L is the wavelength (5.12/ft^2). Using the PGA calculated for the 2,475-year event of 0.20 g, the maximum wave height of a seiche is estimated to be 0.06 cm.

The estimated value of the peak wave for the seiche at the Site is extremely low and for practical purposes, insignificant. In addition, the ratio between the Reservoir and the natural period of the seismic event that could occur on Site is on the order of 125:1 (25/0.2), which indicates a possible resonance condition is unlikely.

Given the size of the Reservoir and the anticipated earthquake dominant period, resonance will not occur at the Site between the Reservoir and ground shaking, therefore the risk of a damaging seiche is insignificant and any seismic generated wave will be controlled by the design freeboard. Thus, the Project would not result in significant impacts under criterion "i" above.

Level of Significance Before Mitigation: Less than Significant
Mitigation Measures: None Required

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6. CONCLUSIONS

As described in previous sections, SLR has conducted a review of baseline and Project related conditions and has evaluated potential Project related impacts relating to Hydrology and Water Quality based on CEQA Appendix G criteria. Based on our evaluation, we have identified no significant impacts.

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7. REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2008. Alaska Administrative Code (18 AAC 75), Oil and Other Hazardous Substances Pollution Control, as amended through October 9.

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

FEMA, 2009, Flood Insurance Study, Tulare County and Incorporated Areas.

FERC, 2012 "Notice of Preliminary Permit Application file by Kaweah River Power Authority, Federal Energy Regulatory Commission Document 2012-21178, Filed August 27, 2012.

Fugro, 2007, Water Resources Investigation of the Kaweah Delta Conservation District.

GEI/GSI, 2020, Kaweah Subbasin – Basin Setting Components, GEI Consultants and GSI Water Solutions, January 10, 2020.

GKGSA, 2020, Groundwater Sustainability Plan, Greater Kaweah Groundwater Sustainability Agency, January 22, 2020.

Irrigation Training and Research Center, undated, http://www.itrc.org/databases/cecaplrp/CEC%20APLRP%20Case%20Study%20TID.pdf. retrieved August 22, 2014.

Luhdorff and Scalmanini, 1995, Impact Analysis, Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California.

Luhdorff and Scalmanini, 2004, Assessment of Hydrology and Water Quality, Kaweah South Mining Project.

Schmidt, 2012, *Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project.*

SLR, 2021, McKay Point Reservoir Project – Geology and Soils Technical Study, December 2021.

Tulare Irrigation District, 2011, Groundwater Elevation Monitoring, December 2011.

University of California Irvine (UCI), 2018, AghaKouchak, Amir, Elisa Ragno, Charlotte Love, and Hamed Moftakhari. *Projected changes in California's precipitation intensity-duration-frequency curves.* California's Fourth Climate Change Assessment, California Energy Commission. Publication Number: CCCA4-CEC-2018-005.

US Army Corps of Engineers, 1990, Kaweah River Basin, California.

US Army Corps of Engineers, 2005, Water Control Manual, Terminus Dam and Lake Kaweah, Drought Contingency Plan for Terminus Dam and Lake Kaweah.

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Kaweah and St. Johns Rivers Association (Watermaster), 1933-2020, Annual Reports.

Western Regional Climate Center, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4890, downloaded September 19, 2014.

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LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations after the performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. When performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the Site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the Site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall Site environmental conditions.

The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the Site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws, rules, regulations, or policies of federal, state, or local governmental agencies.

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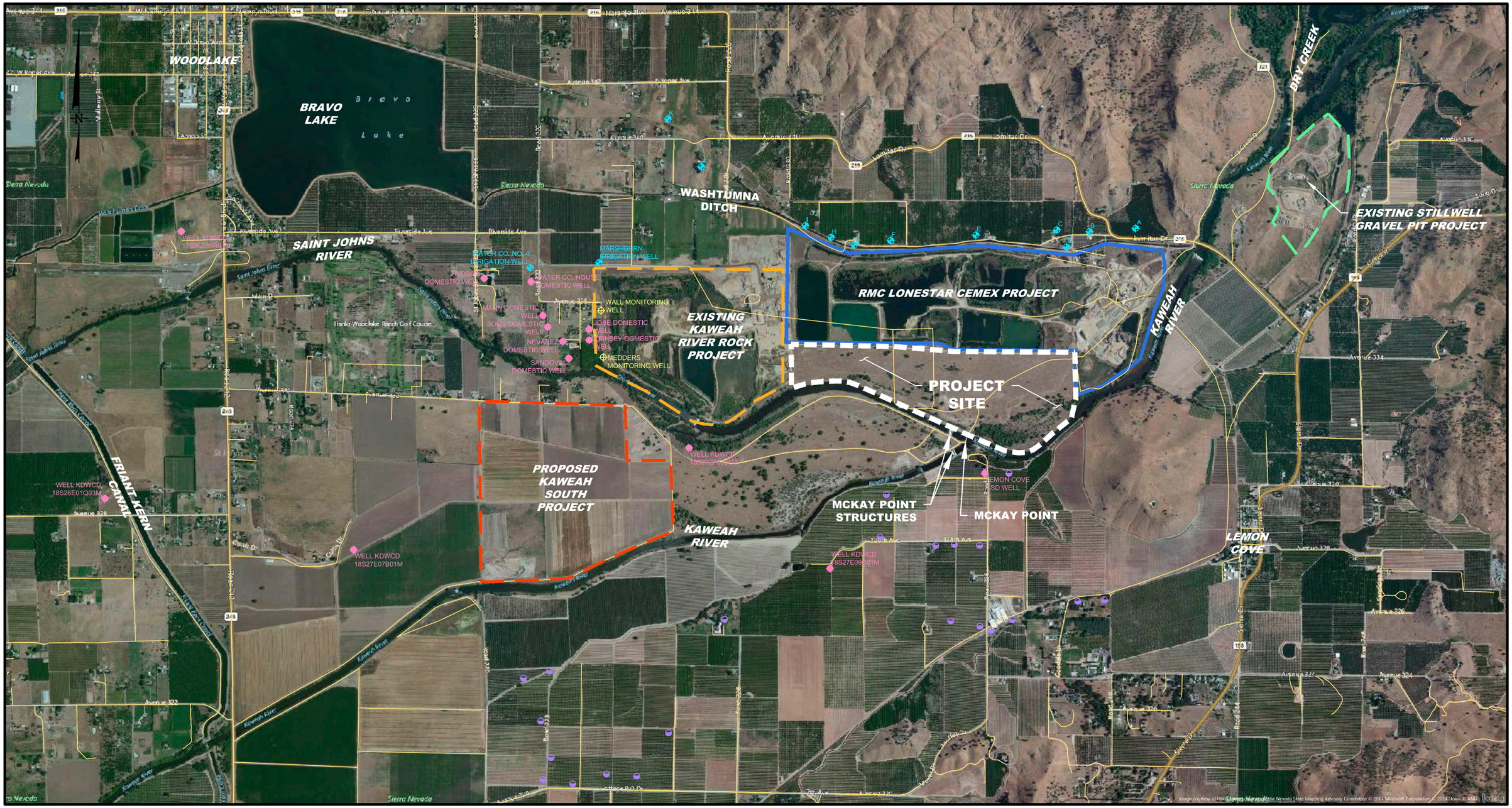
FIGURES

DRAFT



REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **SITE LOCATION MAP**	DRAWING No. **1** REV A

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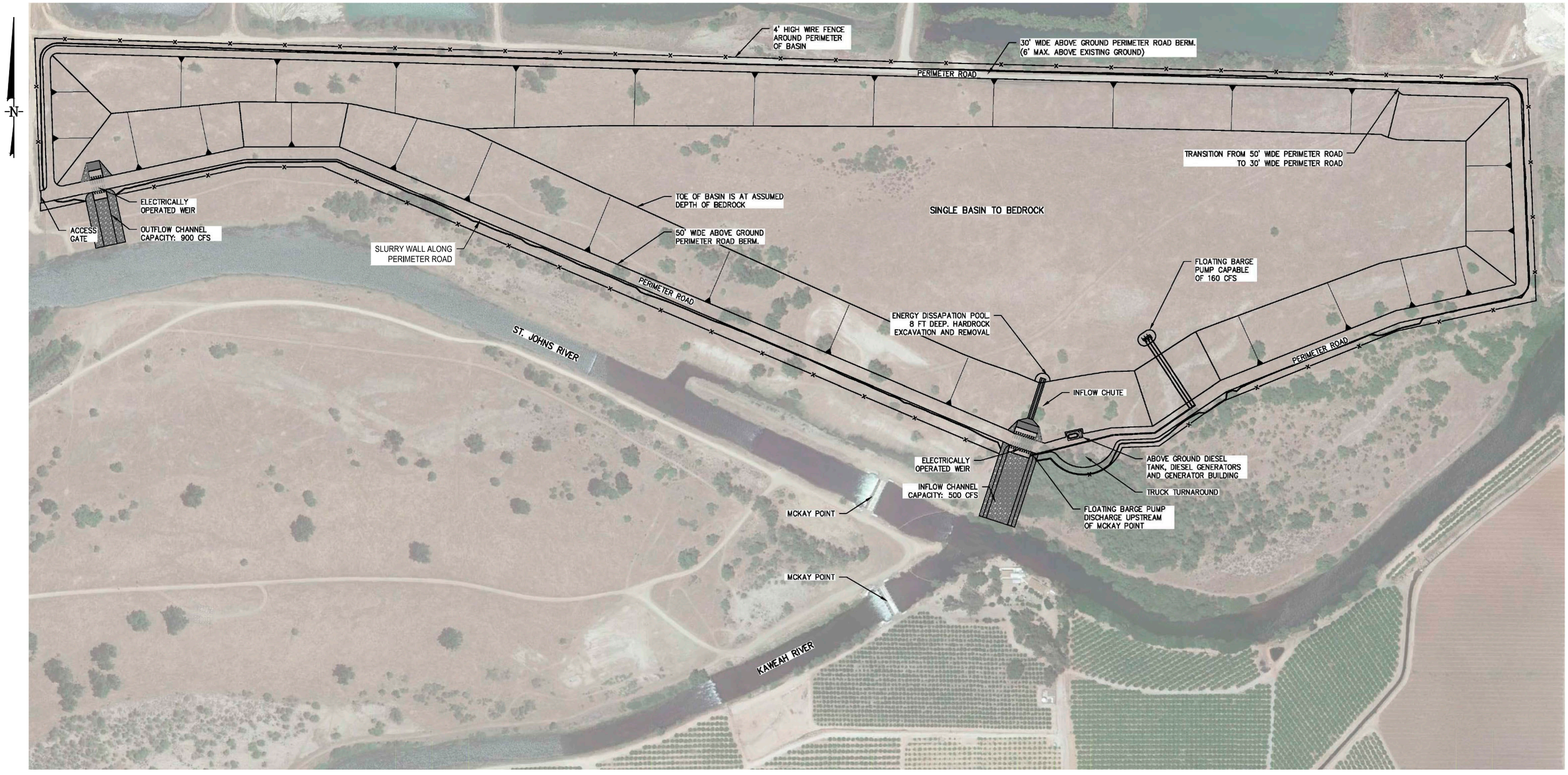
LEGEND

- EXISTING ROADS
- IRRIGATION WELL LOCATIONS
- DOMESTIC WELL LOCATIONS
- MONITORING WELL LOCATIONS
- SUPPLY WELL LOCATIONS

2000 0 4000 FT

REPORT: ---	CLIENT: **SESPE CONSULTING, INC**	ISSUED DATE: 2/28/21
PROVIDED BY: SLR INTERNATIONAL CORPORATION, *Consulting Engineers & Scientists*, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00005
	TITLE: **SITE VICINITY MAP**	FIGURE No.: **2** / REV: B

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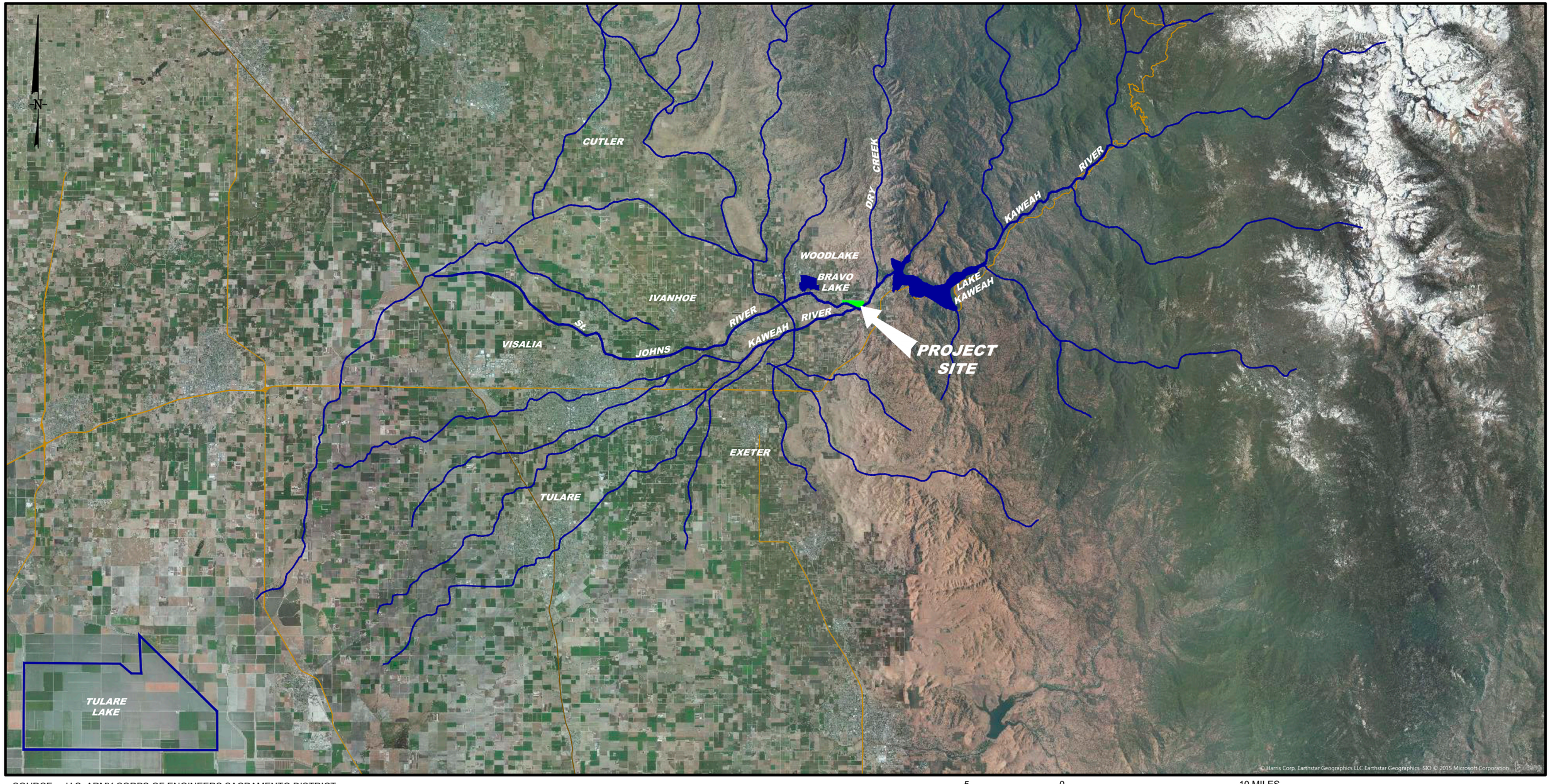


SOURCE: PROVOST & PRITCHARD, 2/18/14
FIGURE 1 - PROPOSED SITE MAP

NOT TO SCALE

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	TITLE **MCKAY POINT RESERVOIR CONCEPTUAL ILLUSTRATION**	FIGURE No. **3** REV A

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5 0 10 MILES

SOURCE: U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT
HYDROLOGY OFFICE REPORT KAWEAH RIVER BASIN, CALIFORNIA, AUGUST 1990
CHART 1 - GENERAL MAP

LEGEND

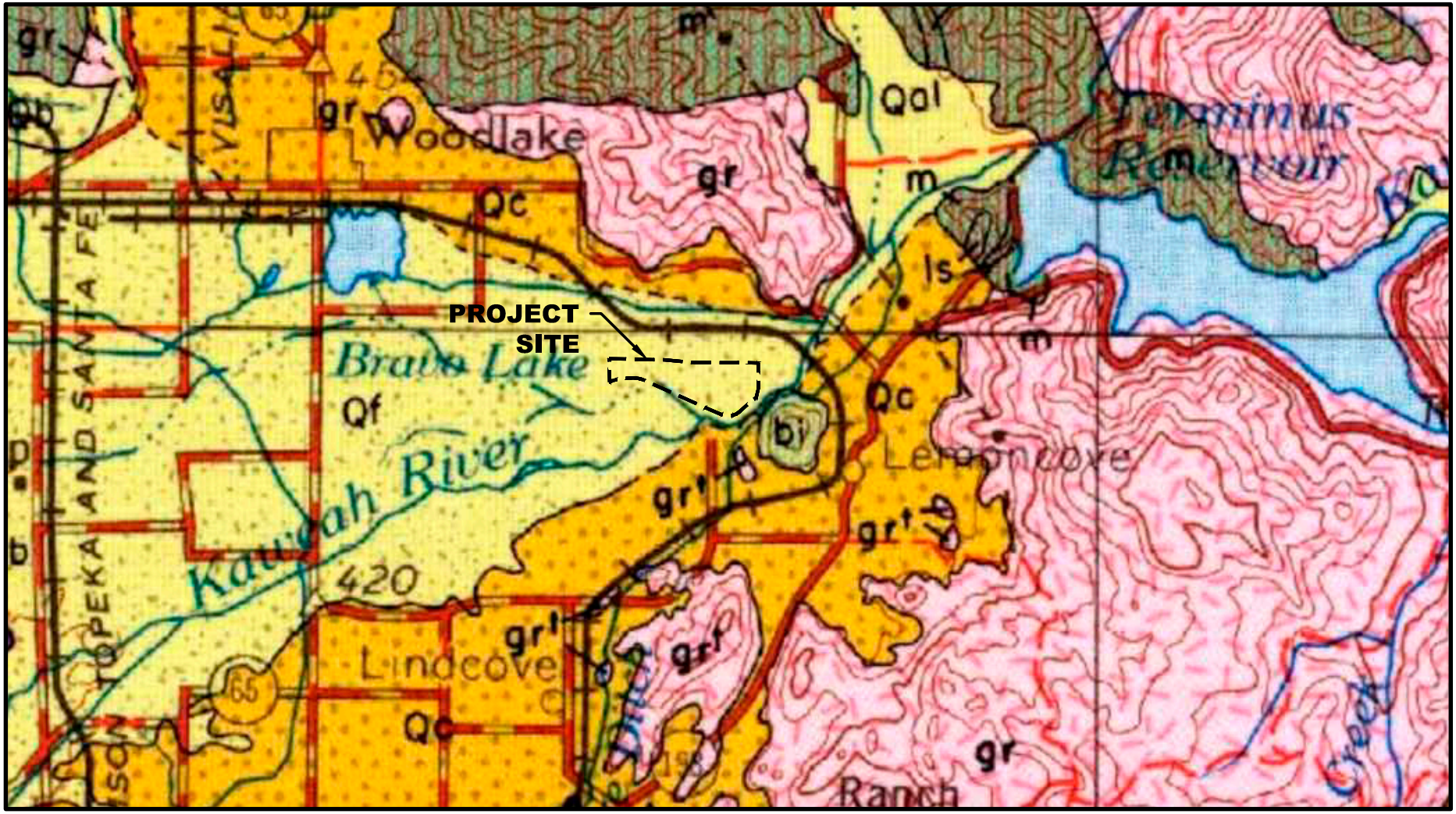
SURFACE WATER BODIES

NOTES

SURFACE WATER BODIES ARE APPROXIMATE

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PROVIDED BY SLR *SLR INTERNATIONAL CORPORATION* *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA. 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00005
	TITLE **SURFACE WATER BODIES IN SITE VICINITY**	FIGURE No. **4** / REV A

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LEGEND:

Qal	- ALLUVIUM
Qf	- FAN DEPOSITS
Qc	- PLEISTOCENE NONMARINE
gr	- MESOZOIC GRANITIC ROCKS
ub	- MESOZOIC ULTRAMAFIC INTRUSIVE ROCKS
m(ls)	- PRE-CRETACEOUS METAMORPHIC ROCKS (ls = LIMESTONE OR DOLOMITE)
ms	- PRE-CRETACEOUS METASEDIMENTARY ROCKS
mv	- PRE-CRETACEOUS METAVOLCANIC ROCKS

SOURCE: GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET, CALIFORNIA GEOLOGICAL SURVEY, 1:250,000 SCALE

0 6000 FT

REPORT: ----

CLIENT: **SESPE CONSULTING, INC**

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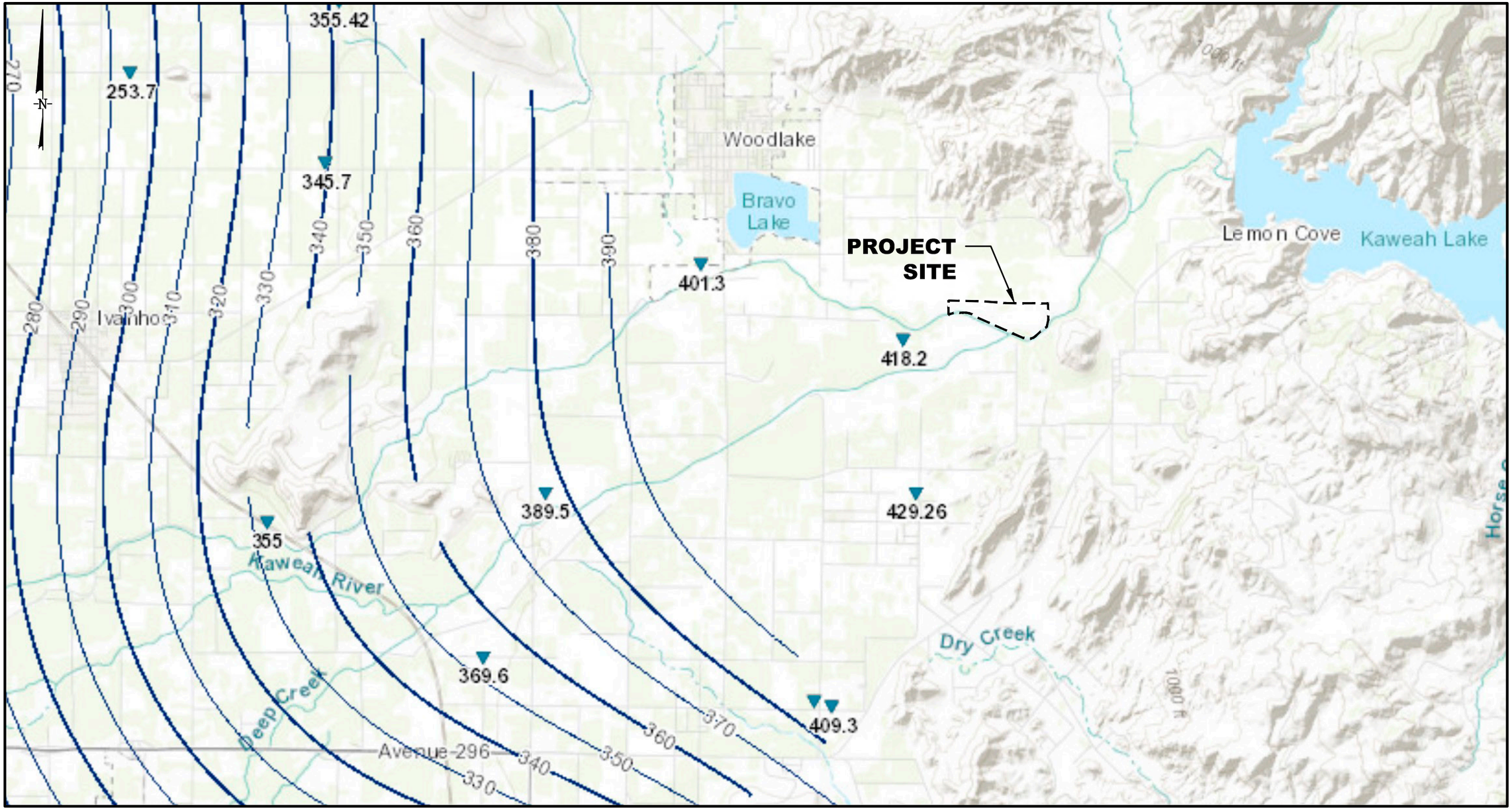
PROJECT: **MCKAY POINT RESERVOIR PROJECT**

PROJECT No.: 117.02125.00005

TITLE: **GEOLOGIC MAP**

FIGURE No.: **5**

REV: A



SOURCE: CALIFORNIA DEPARTMENT OF WATER RESOURCES
GROUNDWATER INFORMATION CENTER, SPRING 2020

LEGEND

GROUNDWATER LEVEL ELEVATION (FT - MSL)

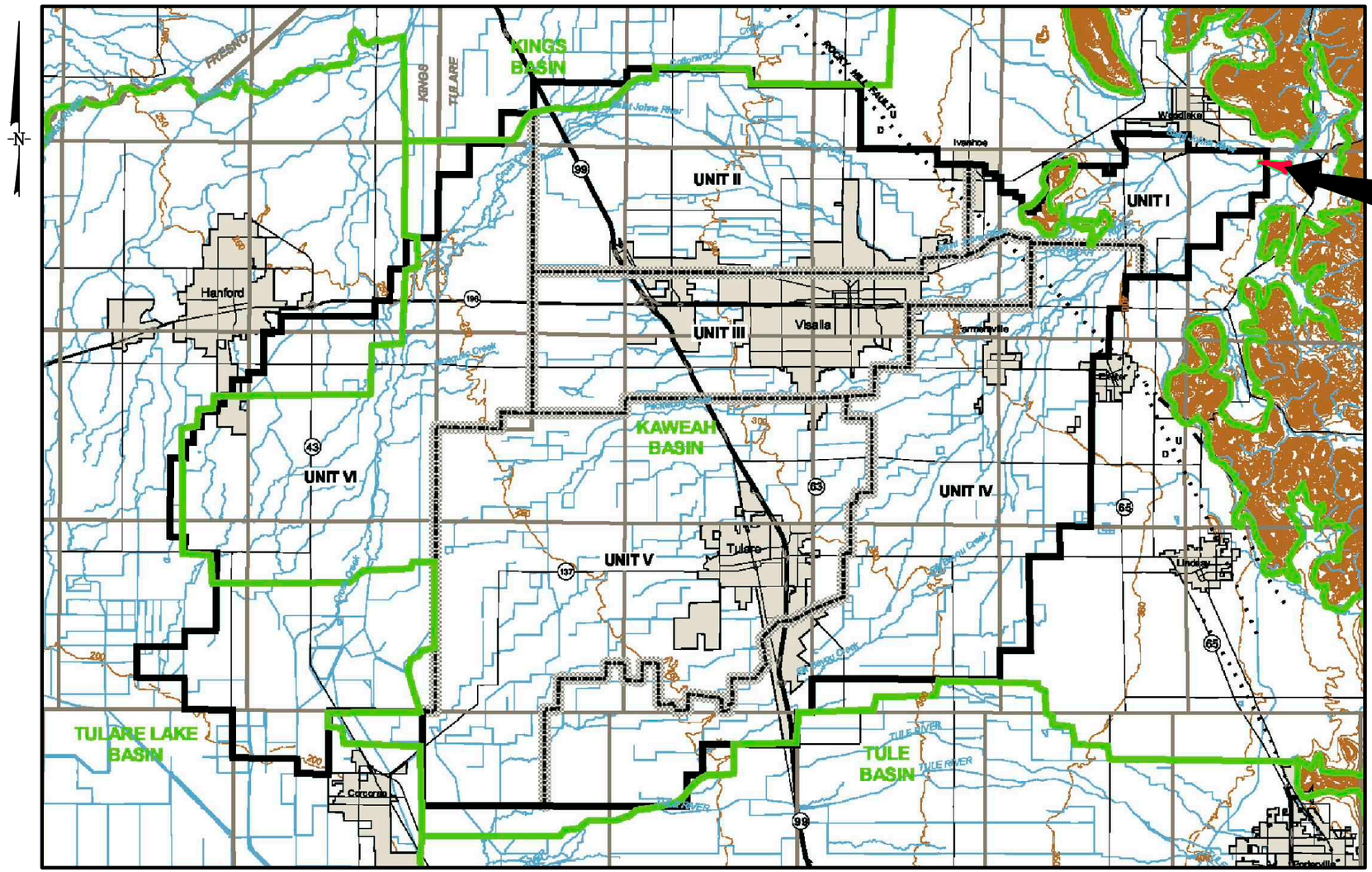
WELL LOCATIONS

NOTES

GROUNDWATER LEVEL CONTOURS ARE APPROXIMATE

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PROVIDED BY: SLR INTERNATIONAL CORPORATION, *Consulting Engineers & Scientists*, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: **MCKAY POINT RESERVOIR PROJECT**	PROJECT No.: 117.02125.00005
	TITLE: **REGIONAL GROUNDWATER LEVEL COUNTOURS**	FIGURE No.: **6** / REV: A

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SOURCE: FURGO WEST, INC., JULY 2007
WATER RESOURCES INVESTIGATION OF THE KAWEAH DELTA WATER CONSERVATION DISTRICT FINAL REPORT
PLATE 2 - STUDY AREA MAP

4 0 8 MILES

LEGEND

- Groundwater Basins
- Fault–dashed where inferred, dotted where concealed; U, upthrown side; D, downthrown side
- District Boundary
- Hydrologic Unit Boundary
- County Line
- Township and Range Lines
- Streams
- Urban Areas

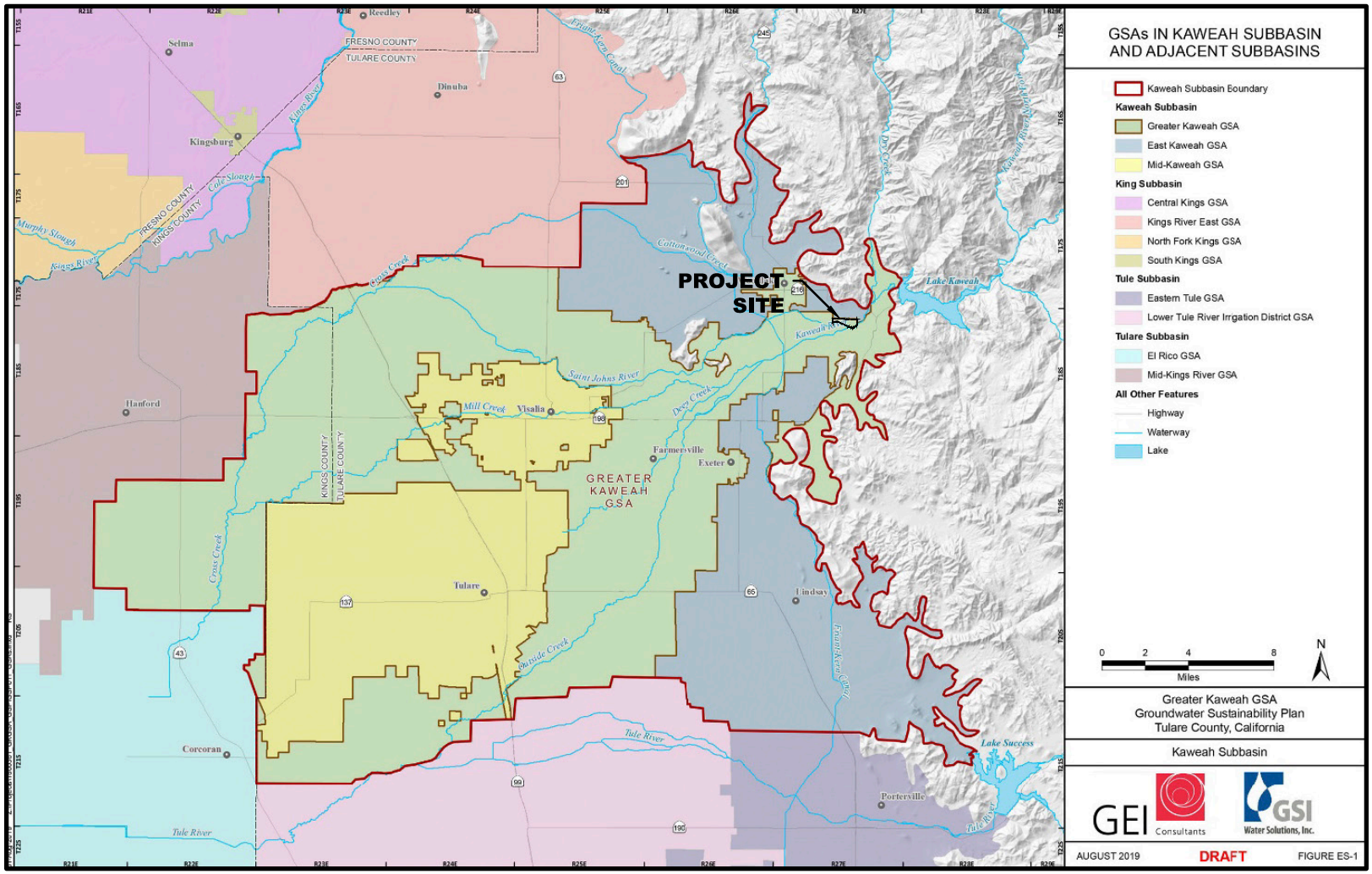
Projection: California State Plane, Zone 4, NAD83, Feet

NOTES

BOUNDARIES ARE APPROXIMATE

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PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: MCKAY POINT RESERVOIR PROJECT	PROJECT No.: 117.02125.00005
	TITLE: KAWEAH DELTA WATER CONSERVATION DISTRICT BOUNDARY	FIGURE No.: 7 / REV: A

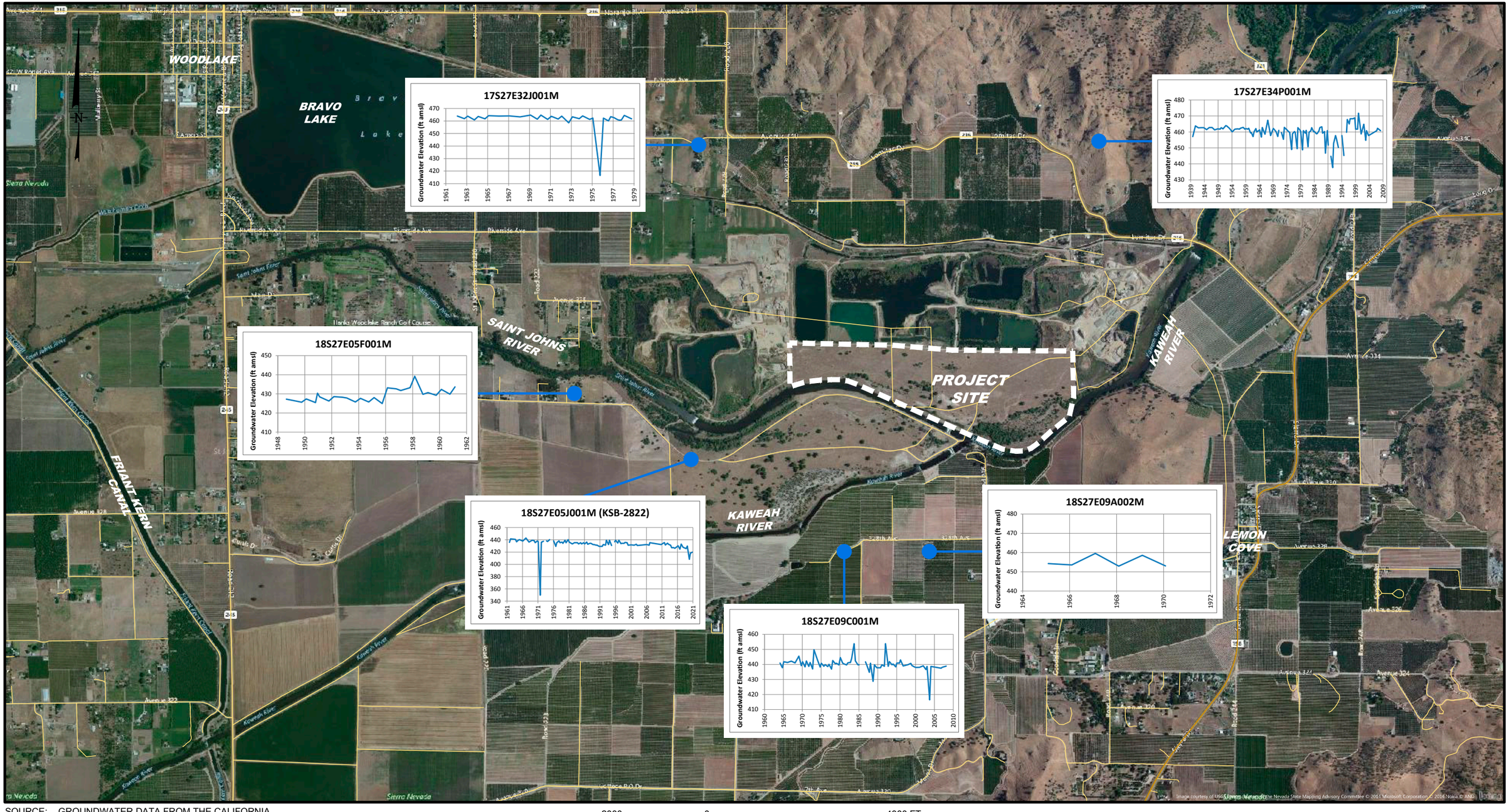
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SOURCE: GREATER KAWEAH GROUNDWATER SUSTAINABILITY AGENCY, JANUARY 22, 2020

REPORT ----	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE 2/28/21
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	TITLE **GREATER KAWEAH GROUNDWATER SUSTAINABILITY AREA**	FIGURE No. **8** REV A

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SOURCE: GROUNDWATER DATA FROM THE CALIFORNIA DEPARTMENT OF WATER RESOURCES

2000 0 4000 FT

LEGEND

GROUNDWATER WELL LOCATION

NOTES

GROUNDWATER WELL LOCATIONS ARE APPROXIMATE

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	TITLE: SELECT GROUNDWATER HYDROGRAPHS IN SITE VICINITY	FIGURE No.: 9 / REV: A

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SOURCE: GROUNDWATER CONTOURS FROM KENNETH D. SCHMIDT AND ASSOCIATES FIGURE 6 - WATER LEVEL ELEVATIONS AND DIRECTION OF GROUNDWATER FLOW (NOVEMBER-DECEMBER, 2011)

1000 0 2000 FT

LEGEND

GROUNDWATER LEVEL ELEVATION (FT - MSL)

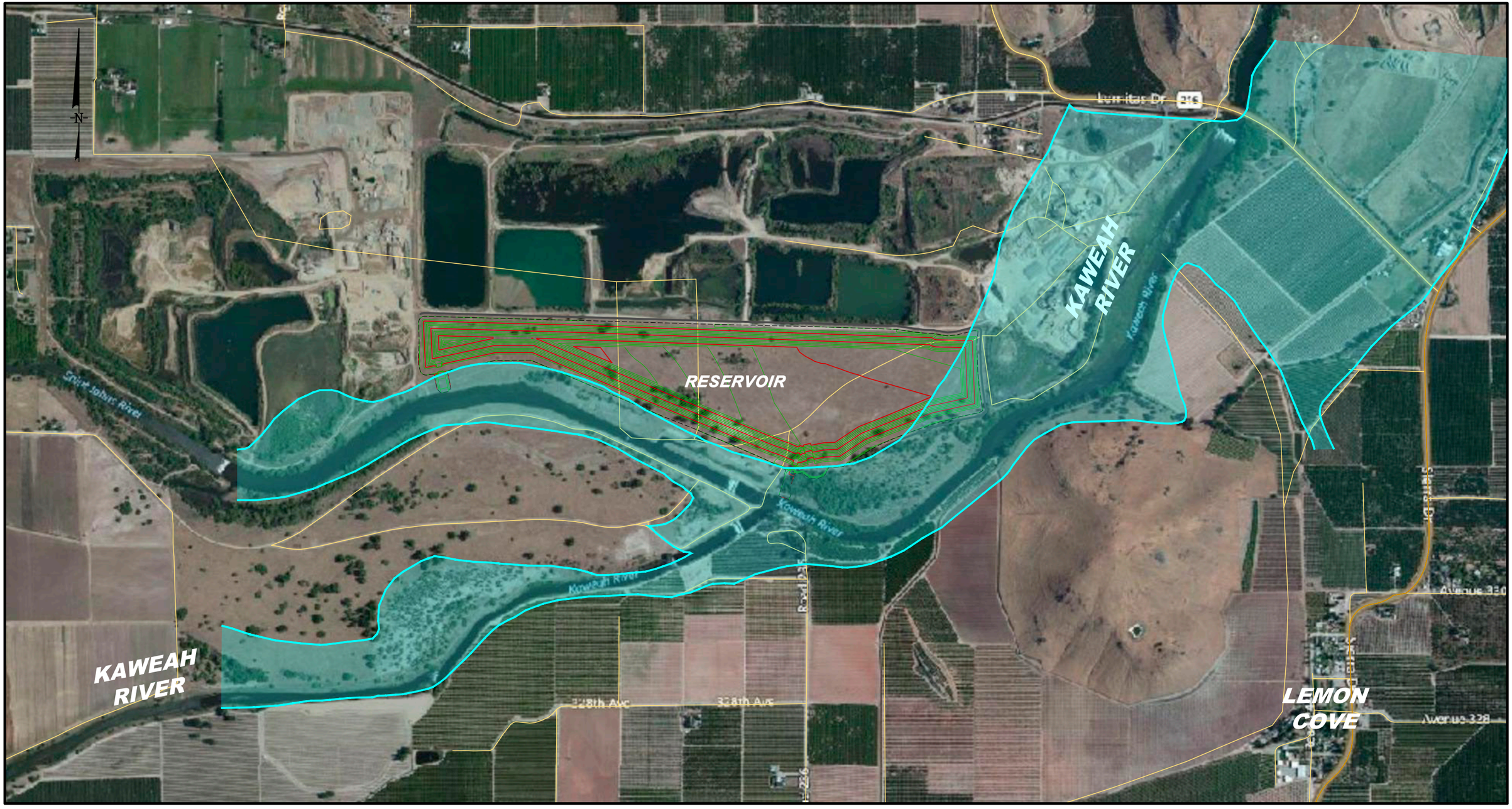
443● GROUNDWATER SPOT ELEVATION (FT - MSL)

NOTES

GROUNDWATER LEVEL CONTOURS ARE APPROXIMATE

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	TITLE: **GROUNDWATER LEVELS IN THE VICINITY**	FIGURE No.: **10** / REV: A

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SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

1000 0 2000 FT

LEGEND

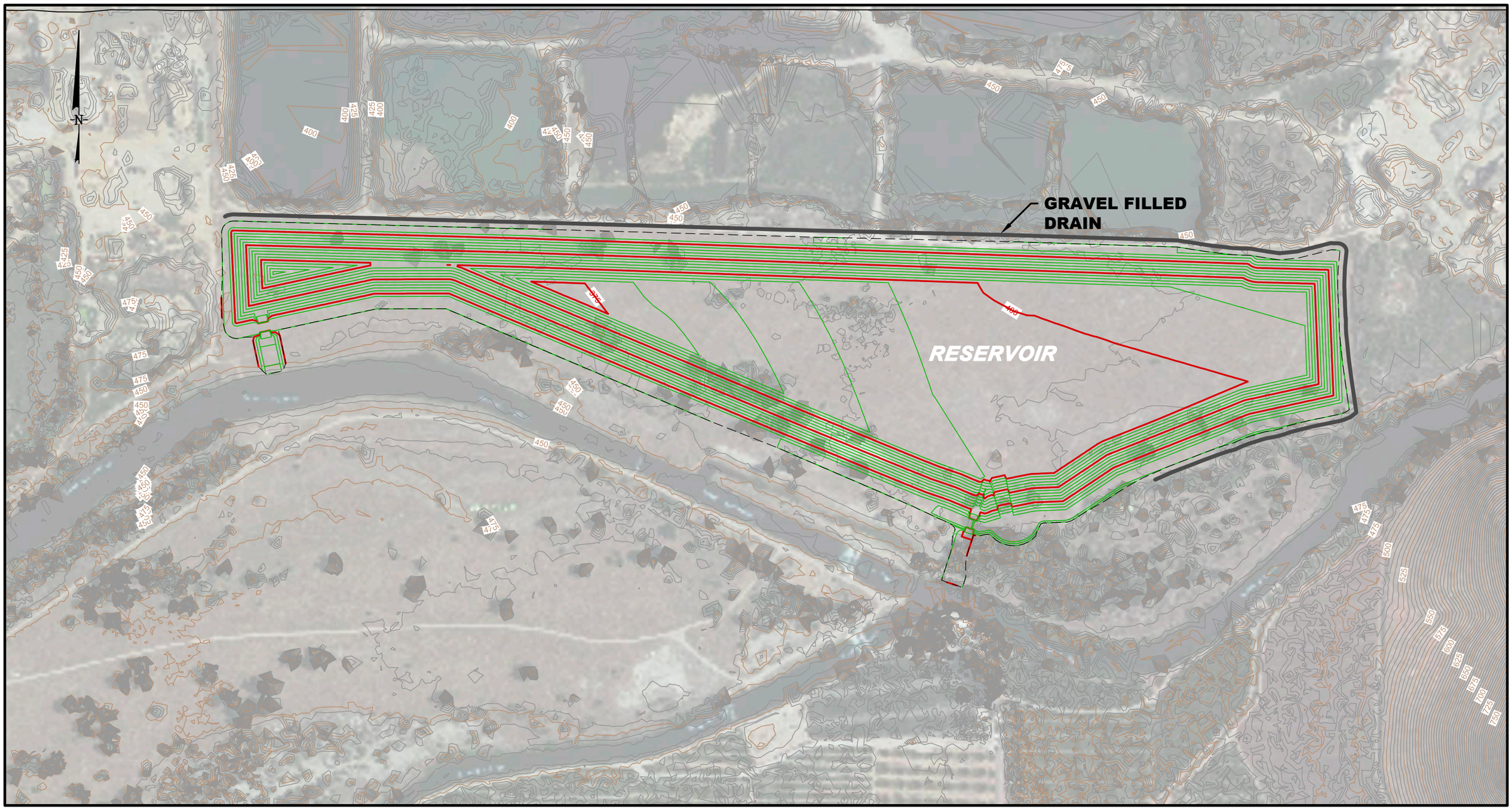
SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1□ ANNUAL CHANCE FLOOD (100-YEAR FLOOD)

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS ARE APPROXIMATE

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	TITLE **FEMA FLOOD HAZARD ZONE**	FIGURE No. **11** / REV A

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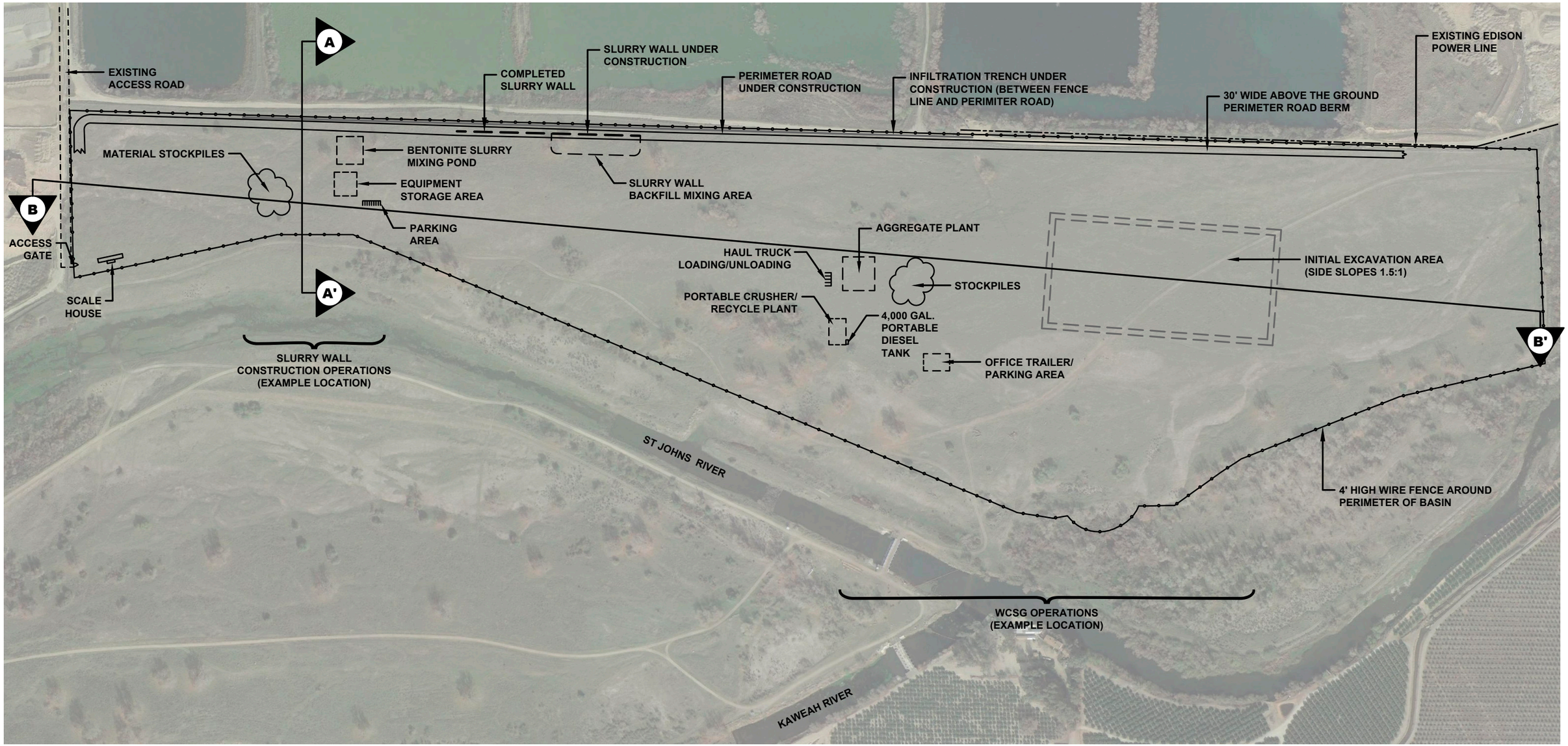


LEGEND

- 100 — EXISTING GROUND SURFACE CONTOUR EL, FEET
- 100 — PROPOSED GROUND SURFACE CONTOUR EL, FEET
- RESERVOIR BOUNDARY

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	TITLE: **EXISTING AND PROPOSED TOPOGRAPHY**	FIGURE No.: **12**	REV: A

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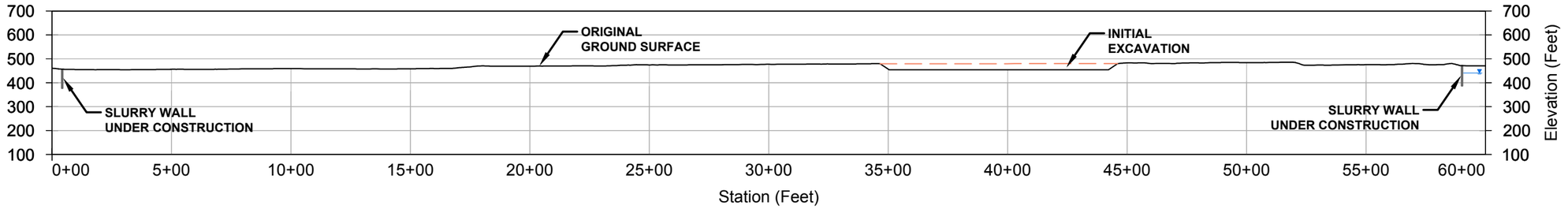
400 FT 0 800 FT

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	TITLE **INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION**	FIGURE No. **13** REV.

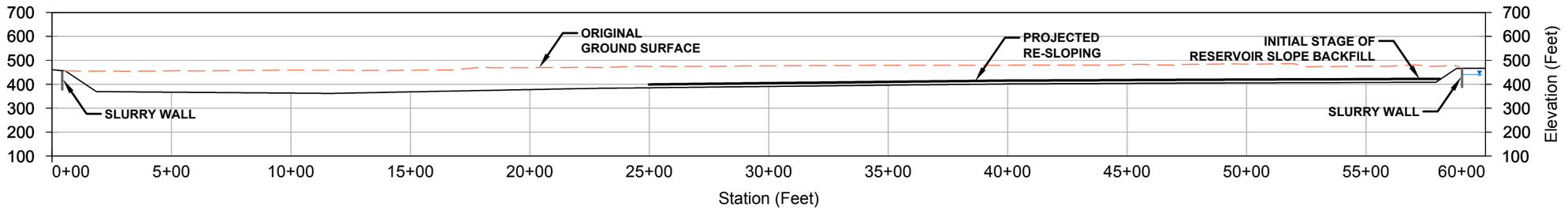
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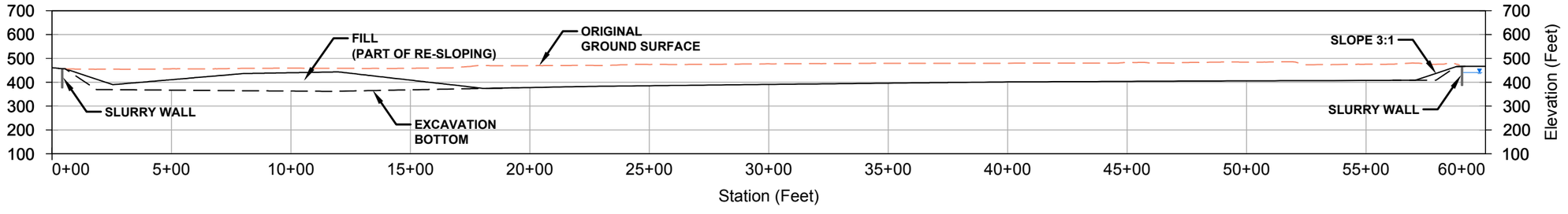
INITIAL STAGE OF EXCAVATION & SLURRY WALL CONSTRUCTION



FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL



COMPLETED RESERVOIR

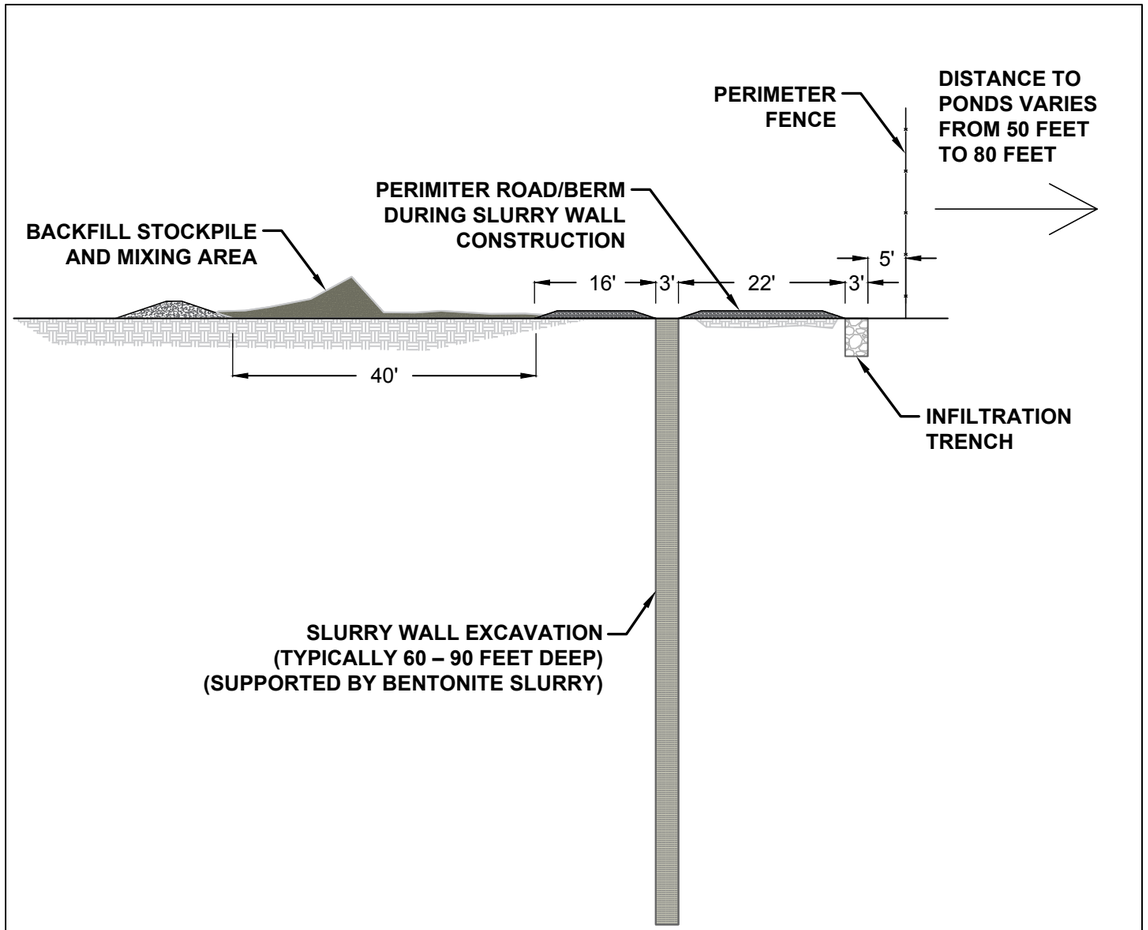


500 FT 0 1,000 FT

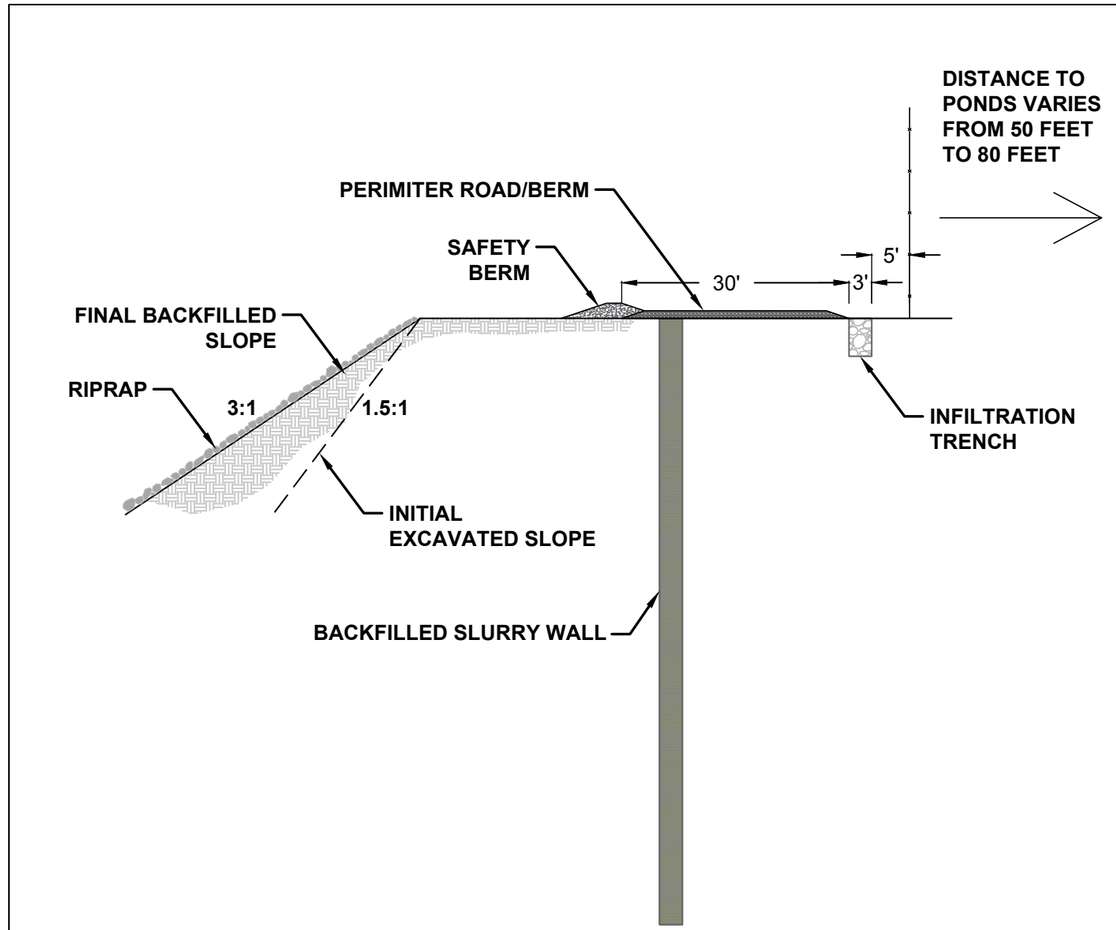
REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE AUGUST, 2021
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **PROFILE B–B'**	FIGURE No. **14** / REV.

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CROSS SECTION A-A'
DURING CONSTRUCTION OF SLURRY WALL



CROSS SECTION A-A'
COMPLETED RESERVOIR

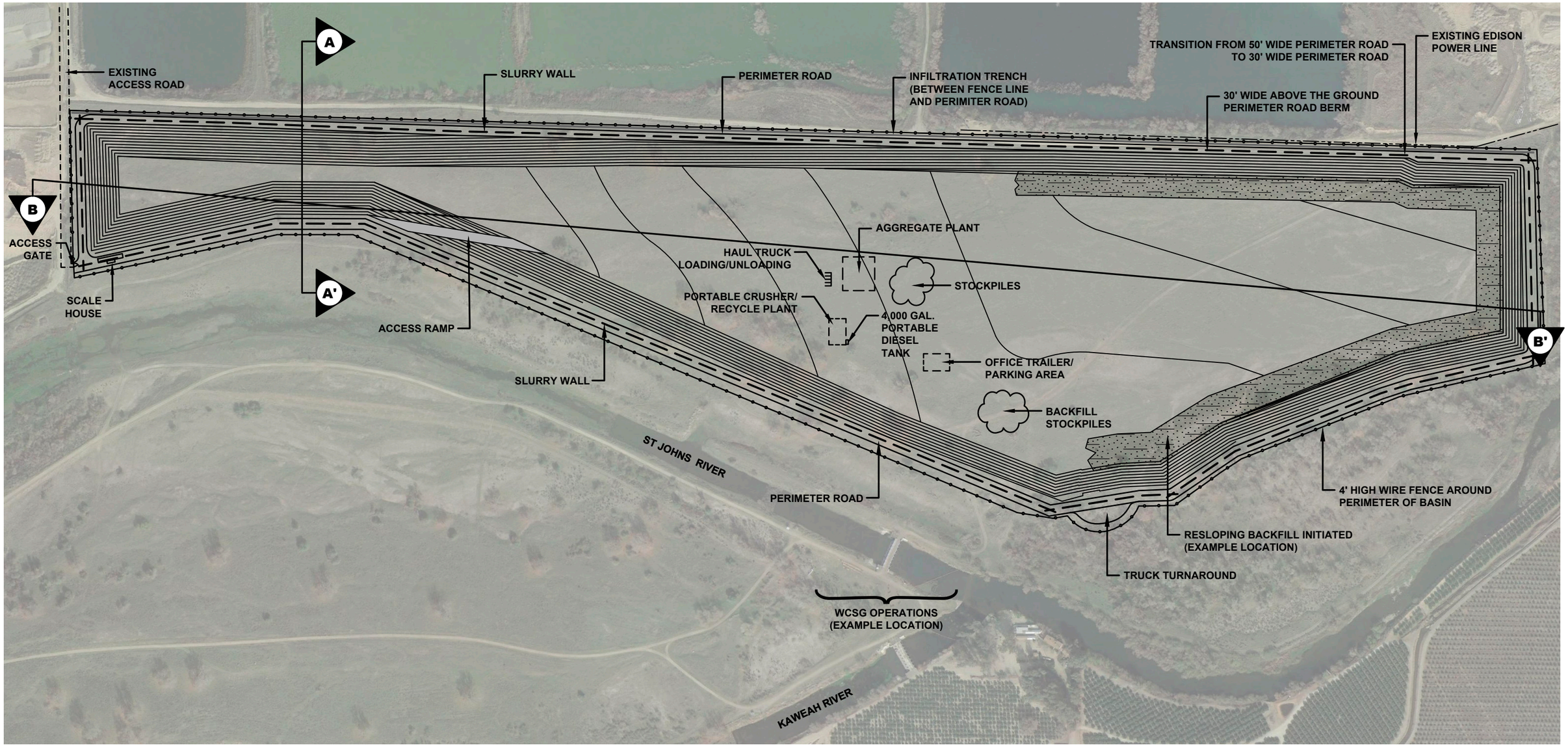
NOTE:
ALL DIMENSIONS SHOWN ARE APPROXIMATE
AND FOR ILLUSTRATION PURPOSES ONLY

20 FT 0 40 FT

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	TITLE **PROFILE A–A'**	FIGURE No. **15** / REV.

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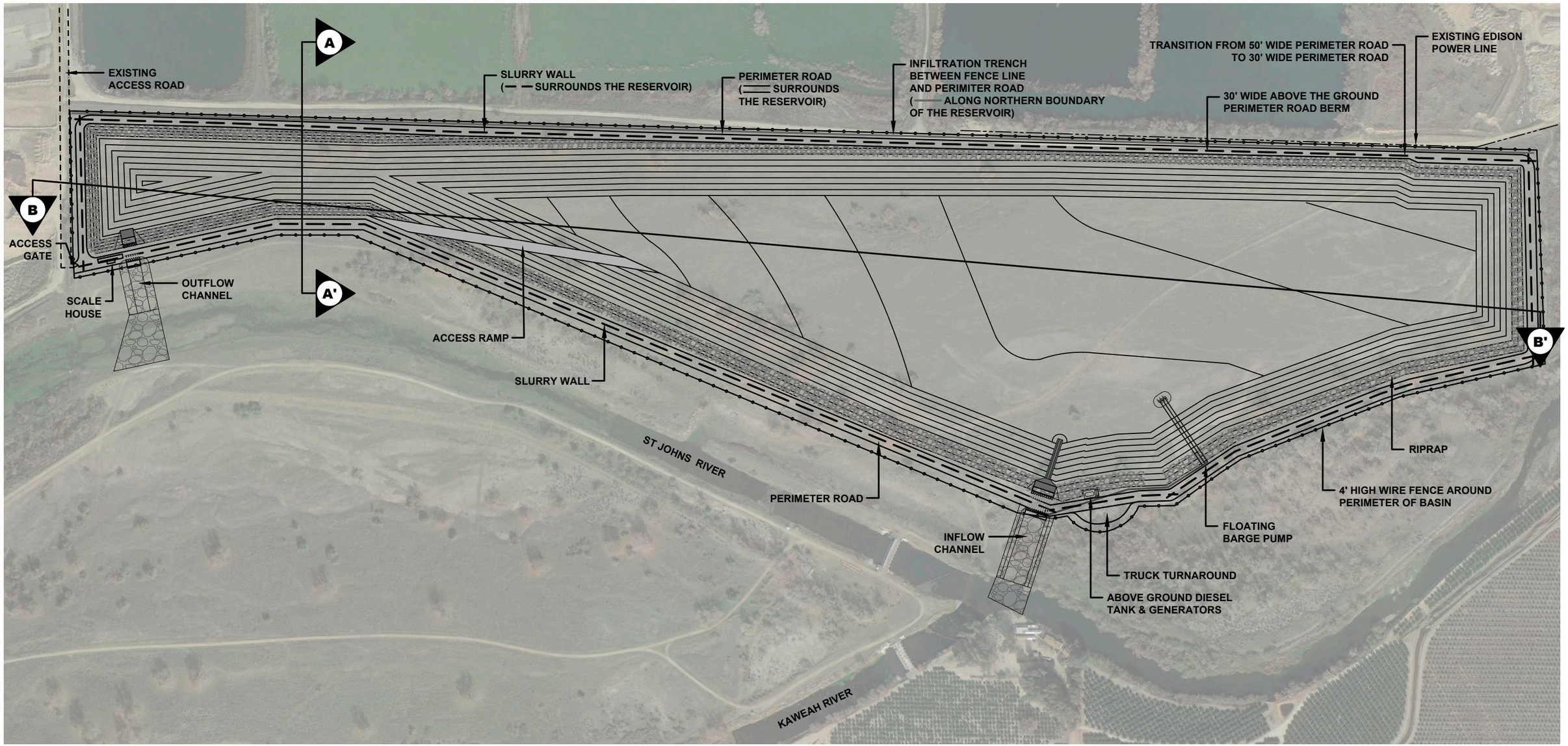


400 FT 0 800 FT

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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **FINAL STAGE OF EXCAVATION & INITIAL STAGE OF RESERVOIR SLOPE BACKFILL**	FIGURE No. **16** / REV.

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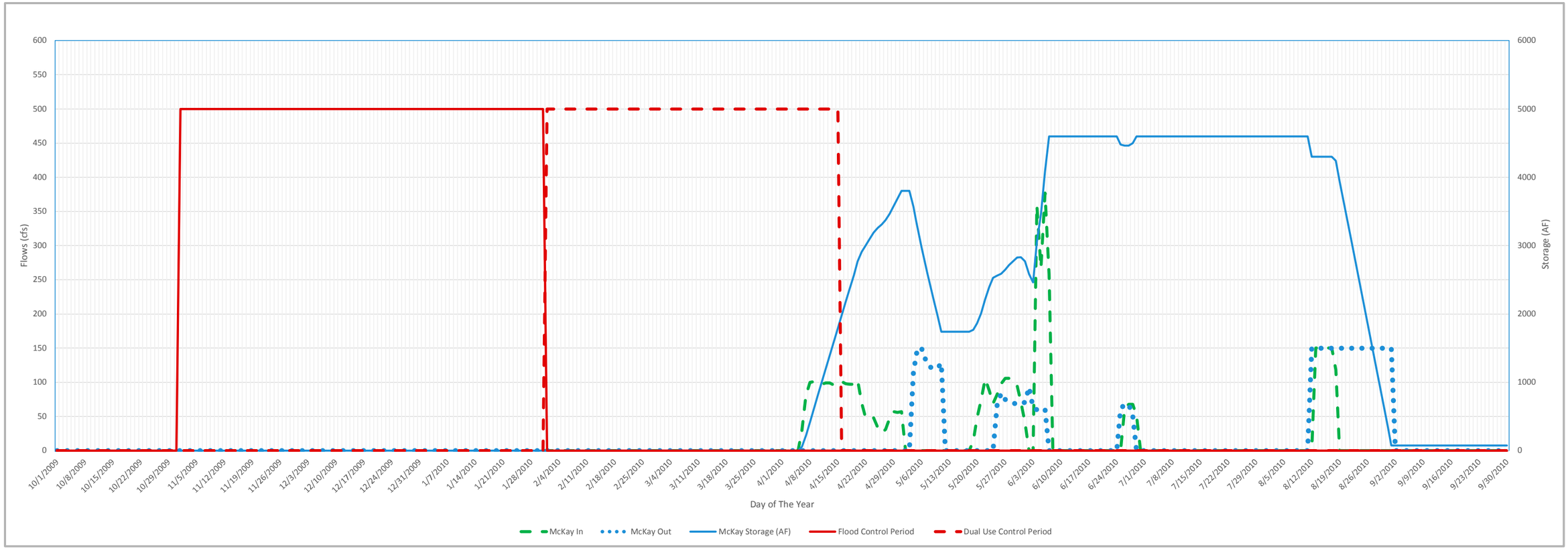


400 FT 0 800 FT

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	TITLE **COMPLETED RESERVOIR**	FIGURE No. **17** / REV.

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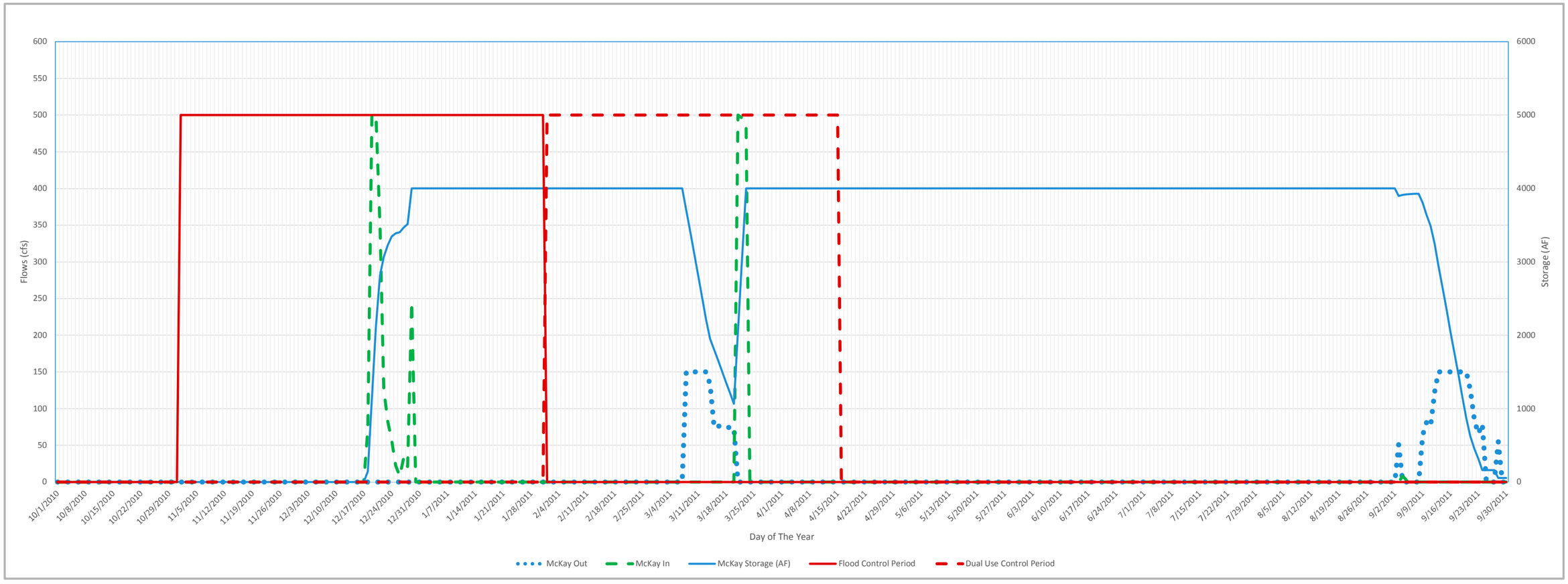
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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2009-2010**	FIGURE No. **18A** / REV.

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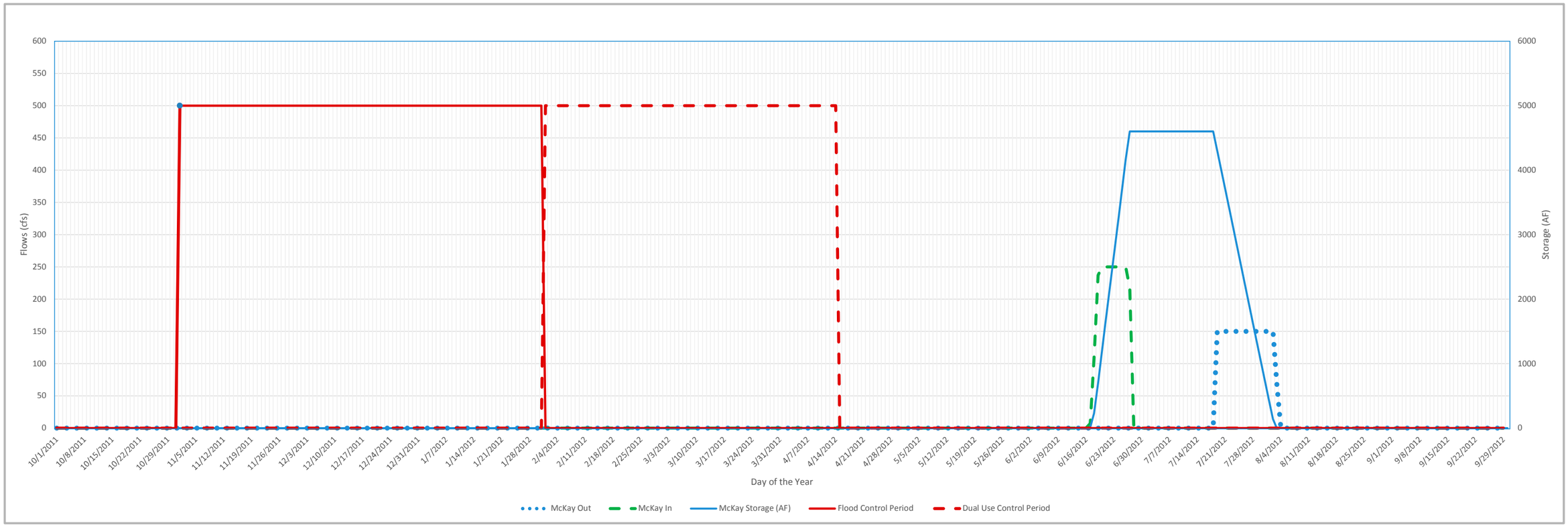
N:\Irvine\Projects\SESPE Consulting\02125 McKay Point Reservoir EIR Update\03 Evaluation\Water Balance\McKay Point Water Resource Model\Figures 18A-D - Master.ai



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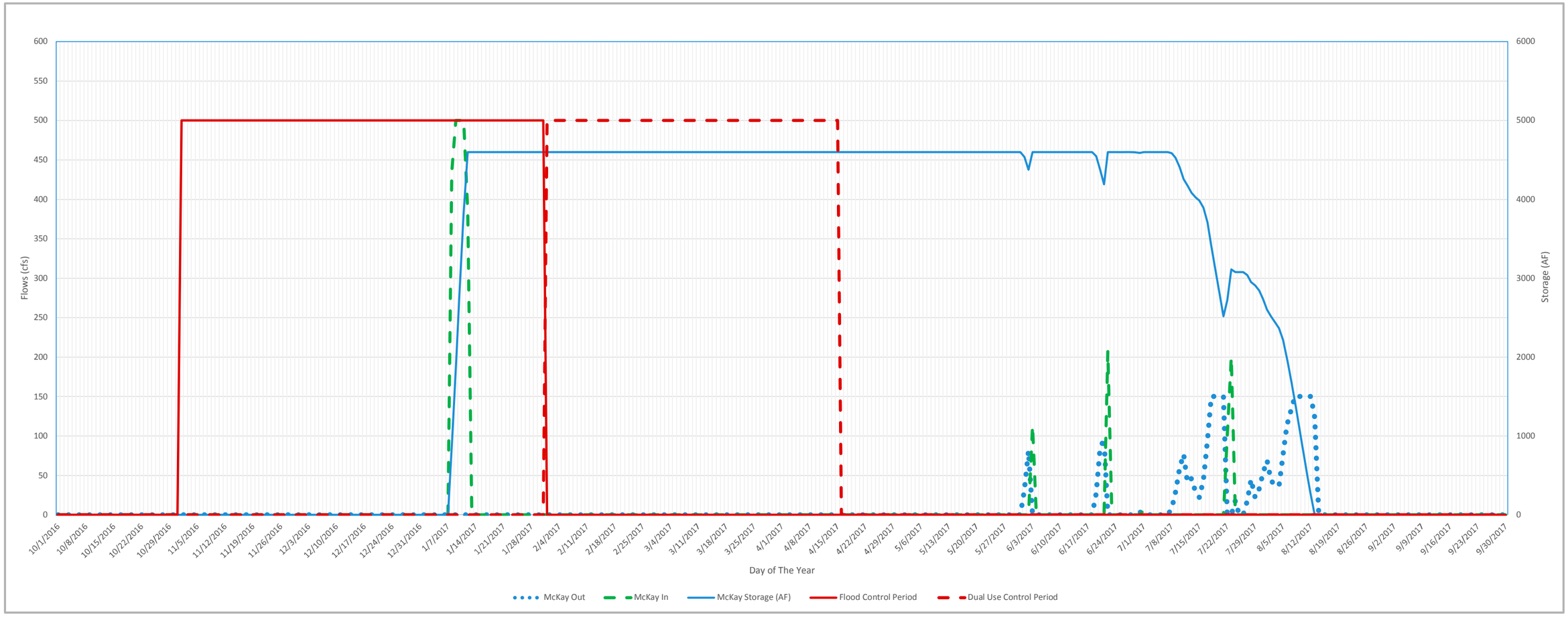
REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2010-2011**	FIGURE No. **18B** REV.

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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
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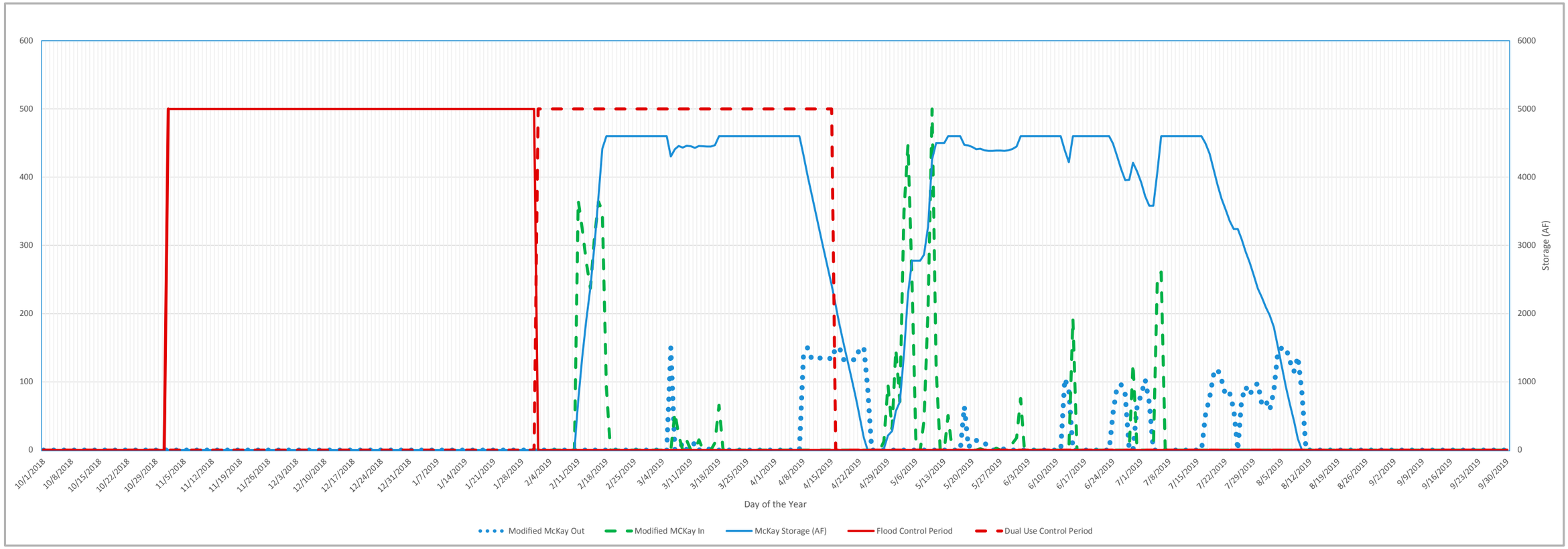
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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2016-2017**	FIGURE No. **18D** REV.

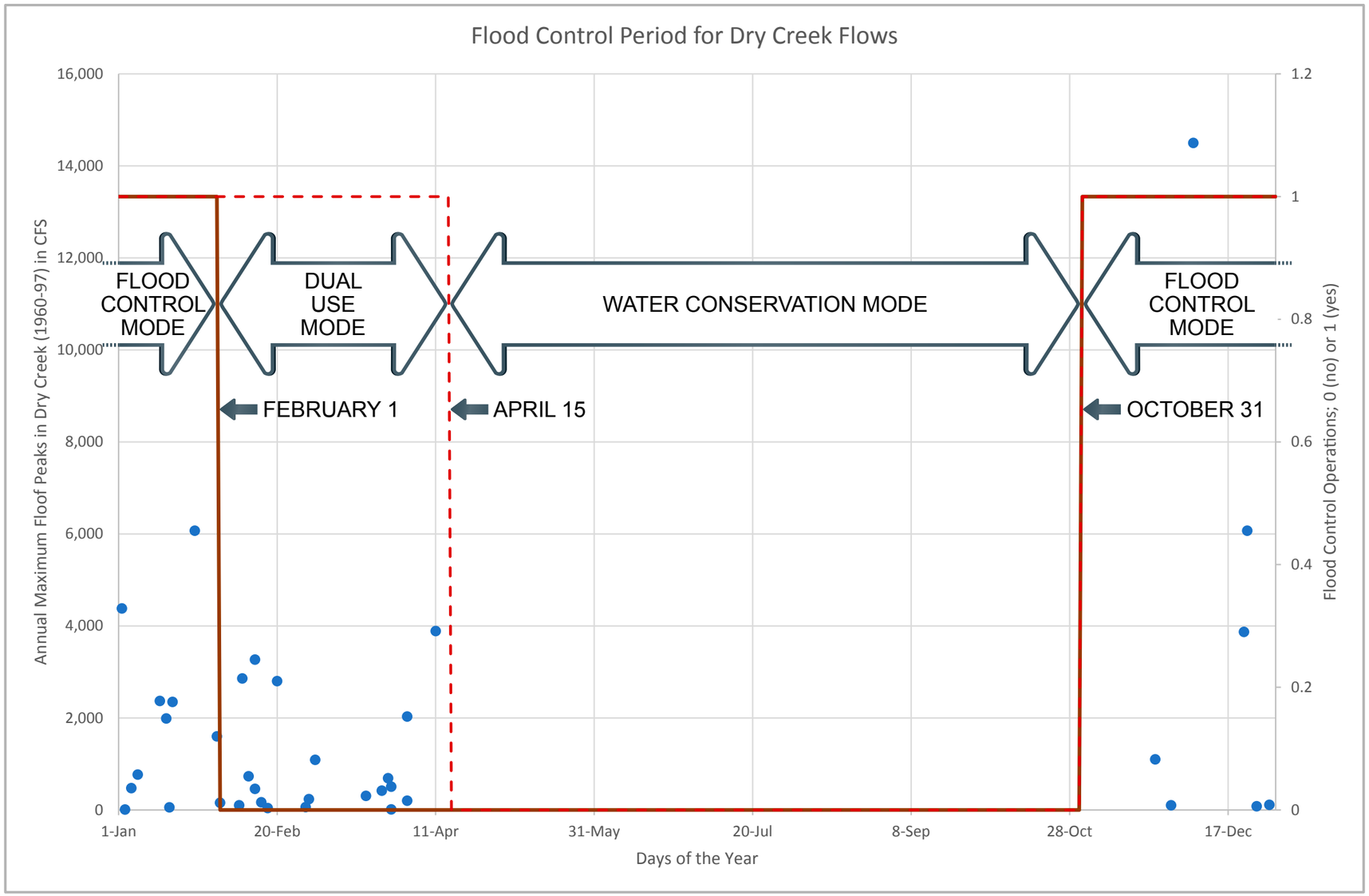
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REPORT - - - -	CLIENT **SESPE CONSULTING, INC**	ISSUED DATE JANUARY, 2022
PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002
	TITLE **EXAMPLE OF OPERATIONS IN WATER SUPPLY MODE IN 2018-2019**	FIGURE No. **18E** REV.

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N:\Irvine\Projects\SESPE Consulting\02125 McKay Point Reservoir EIR Update\03 Evaluation\Water Balance\McKay Point Water Resource Model\Figure 19 - Master.ai

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PROVIDED BY SLR INTERNATIONAL CORPORATION *Consulting Engineers & Scientists* 17701 Cowan Suite 210 Irvine, CA 92614 Tel: (949) 553-8417	PROJECT **MCKAY POINT RESERVOIR PROJECT**	PROJECT No. 117.02125.00002	
	TITLE **ANNUAL MAXIMUM DAILY FLOOD FLOWS IN DRY CREEK ILLUSTRATING RESERVOIR OPERATING MODES**	FIGURE No. **19**	REV.

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APPENDICES

DRAFT

ATTACHMENT A

GEOLOGIC CROSS SECTIONS

DRAFT



LEGEND

GEOLOGIC CROSS-SECTION A-A' & B-B'

ANALYSIS SECTION

Source: Image from Google Earth Pro

N

0 800 1,600

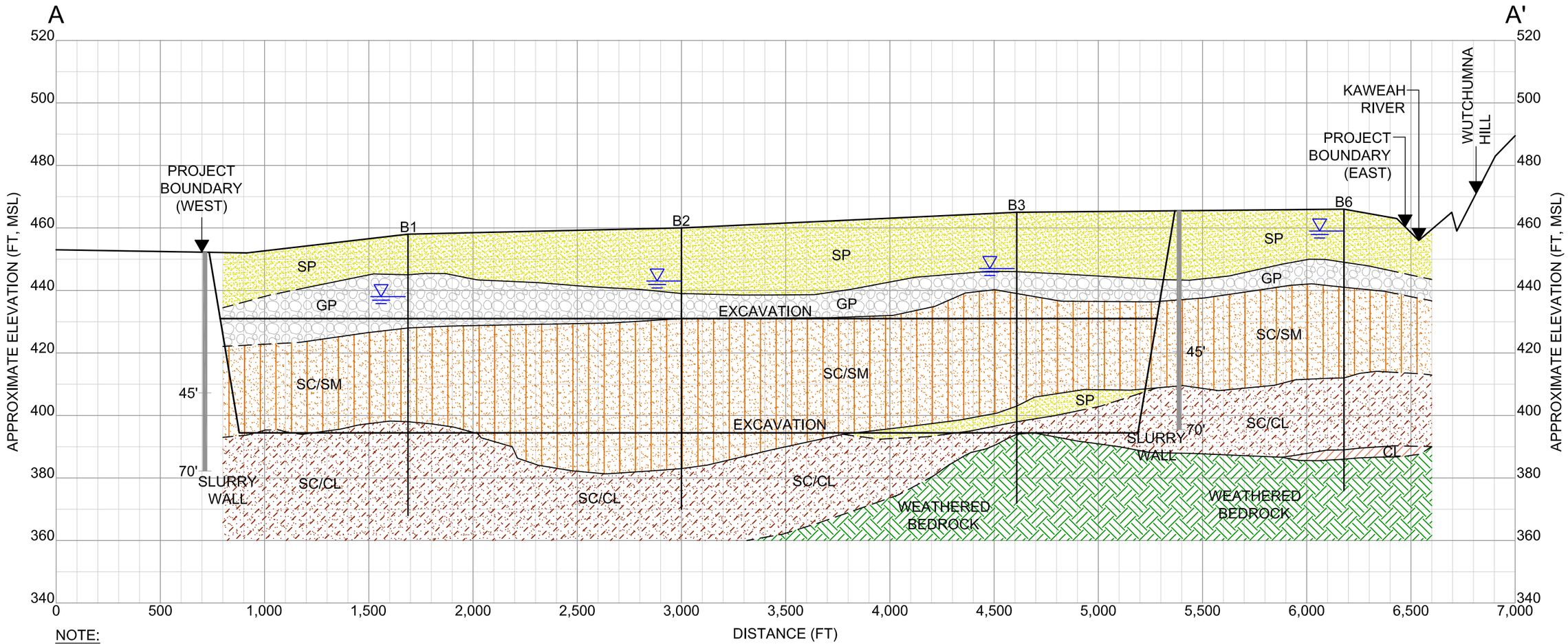
SCALE (FEET)

Seepage Analysis Section and Boring Location Map

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 1 | June 2016 | SLR Consulting USA Pty Ltd Consulting Engineers & Scientists

N:\Irvine\CAD\0228-SESPE-McKay Point\04_REFERENCE\0228_Cross Sections.dwg 6/23/2016 2:55 PM



NOTE:
1. SANDOVAL DOMESTIC WELL LOCATED APPROXIMATELY 4,000 FEET WEST OF SECTION. WATER ELEVATION = 440.98

LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- CL: Clay
- GROUNDWATER ELEVATION DURING DRILLING

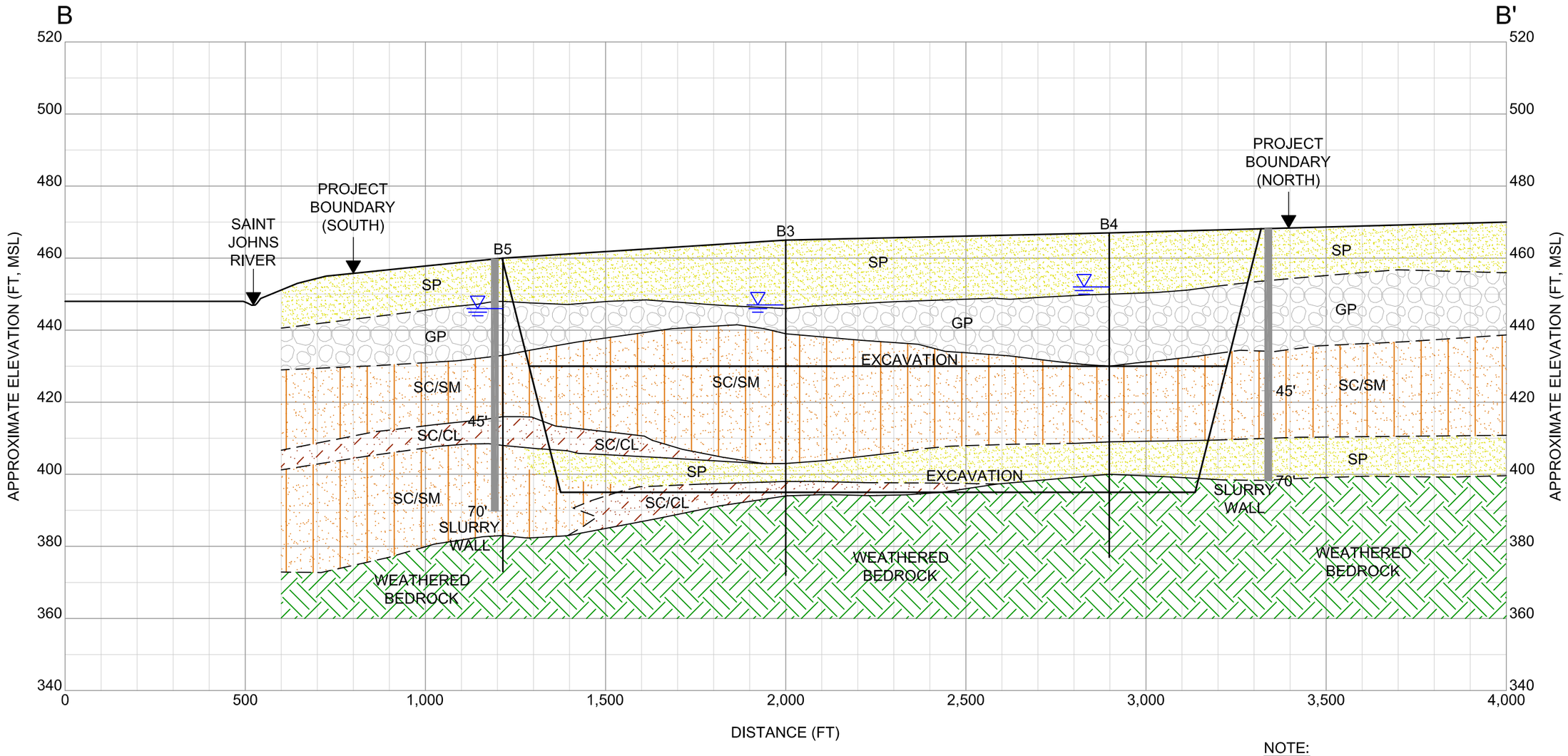
0 500 1,000
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x15

Cross Section A-A'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 2 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

P:\CAD\0228 McKay Point\0228_Cross Sections.dwg 7/11/12 13:12



LEGEND

- SP: SAND; SAND WITH COBBLES; SAND WITH GRAVEL
- GP: GRAVEL; SANDY GRAVEL
- SC/SM: SILTY SAND; CLAYEY SAND
- SC/CL: CLAY; CLAYEY SAND
- WEATHERED BEDROCK: COURSE COBBLE; BOULDERS; WEATHERED GRANITE BEDROCK
- GROUNDWATER ELEVATION DURING DRILLING

NOTE:
1. HEIDMAN WELL LOCATED APPROXIMATELY 2,600 FEET NORTH OF SECTION. WATER ELEVATION = 460.02

0 300 600
HORIZONTAL SCALE (FEET)
VERTICAL EXAGGERATION = x10

Cross Section B-B'

McKay Point Reservoir Project
Tulare Irrigation district
Unincorporated Tulare County, California

Figure 3 | July 2012 | SES STRATEGIC ENGINEERING & SCIENCE

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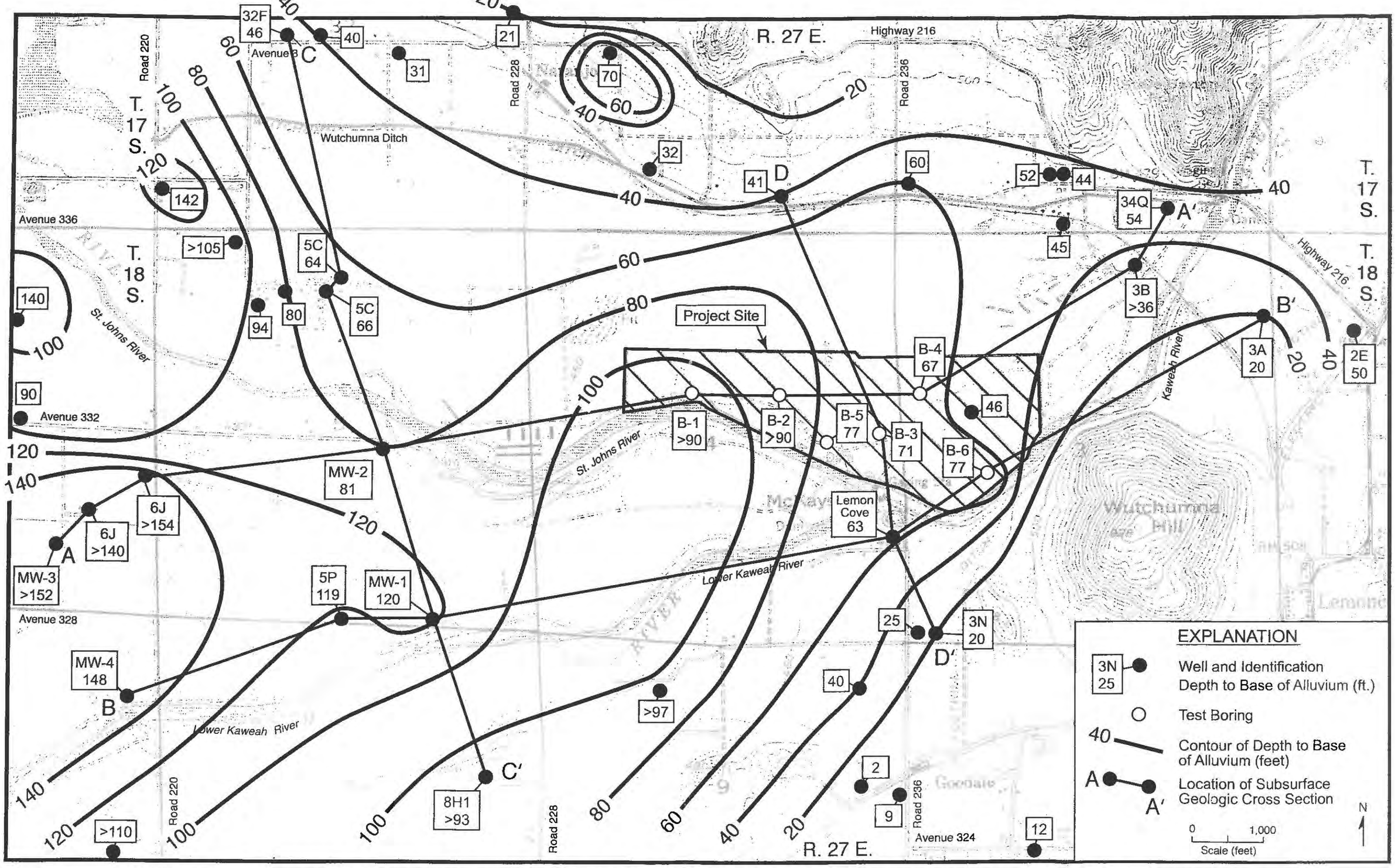


FIGURE 1 - LOCATION OF SELECTED WELLS, TEST HOLES, SUBSURFACE GEOLOGIC CROSS SECTIONS, AND DEPTH TO BASE OF ALLUVIUM

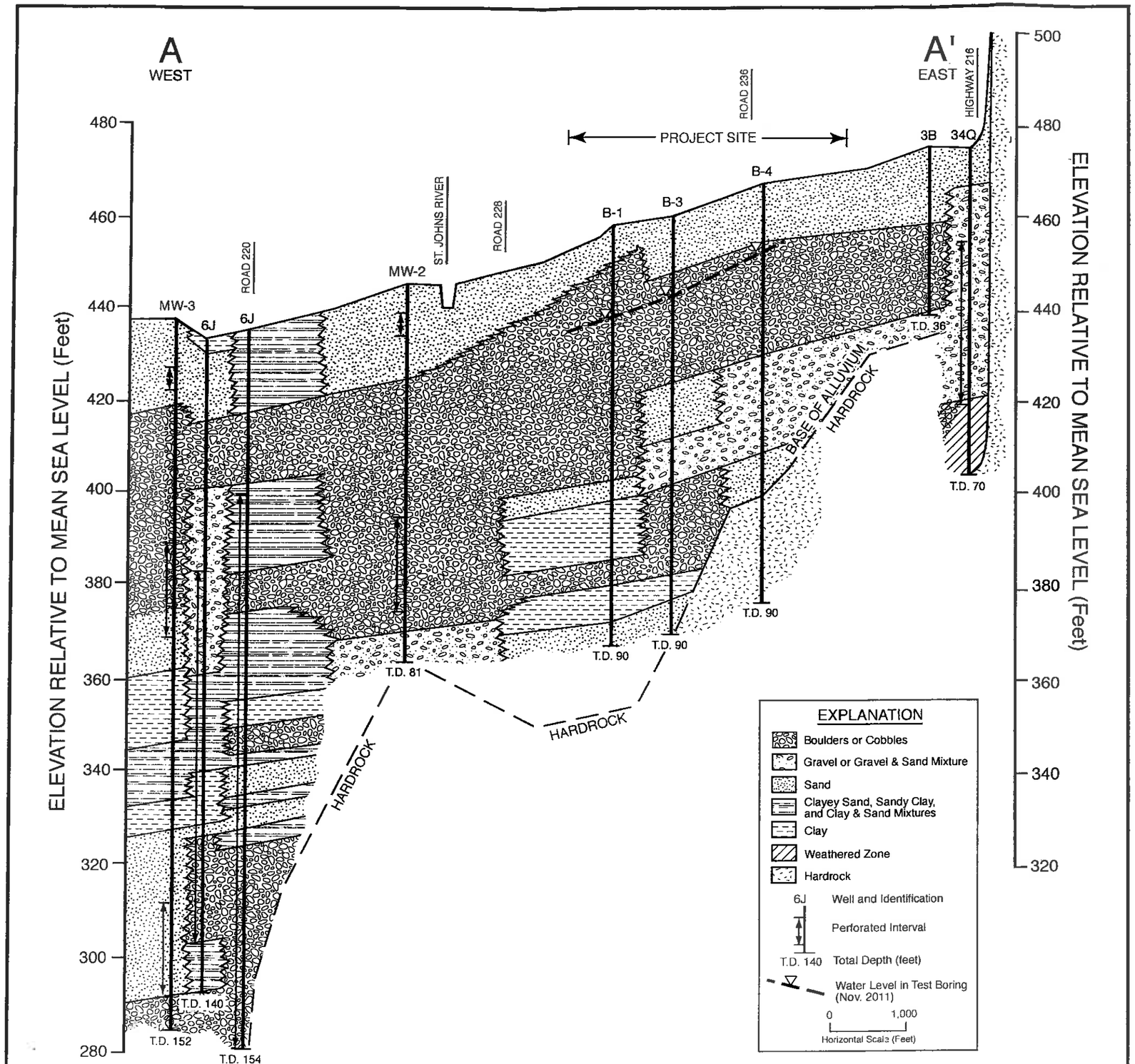


FIGURE 2 - SUBSURFACE GEOLOGIC CROSS SECTION A - A'

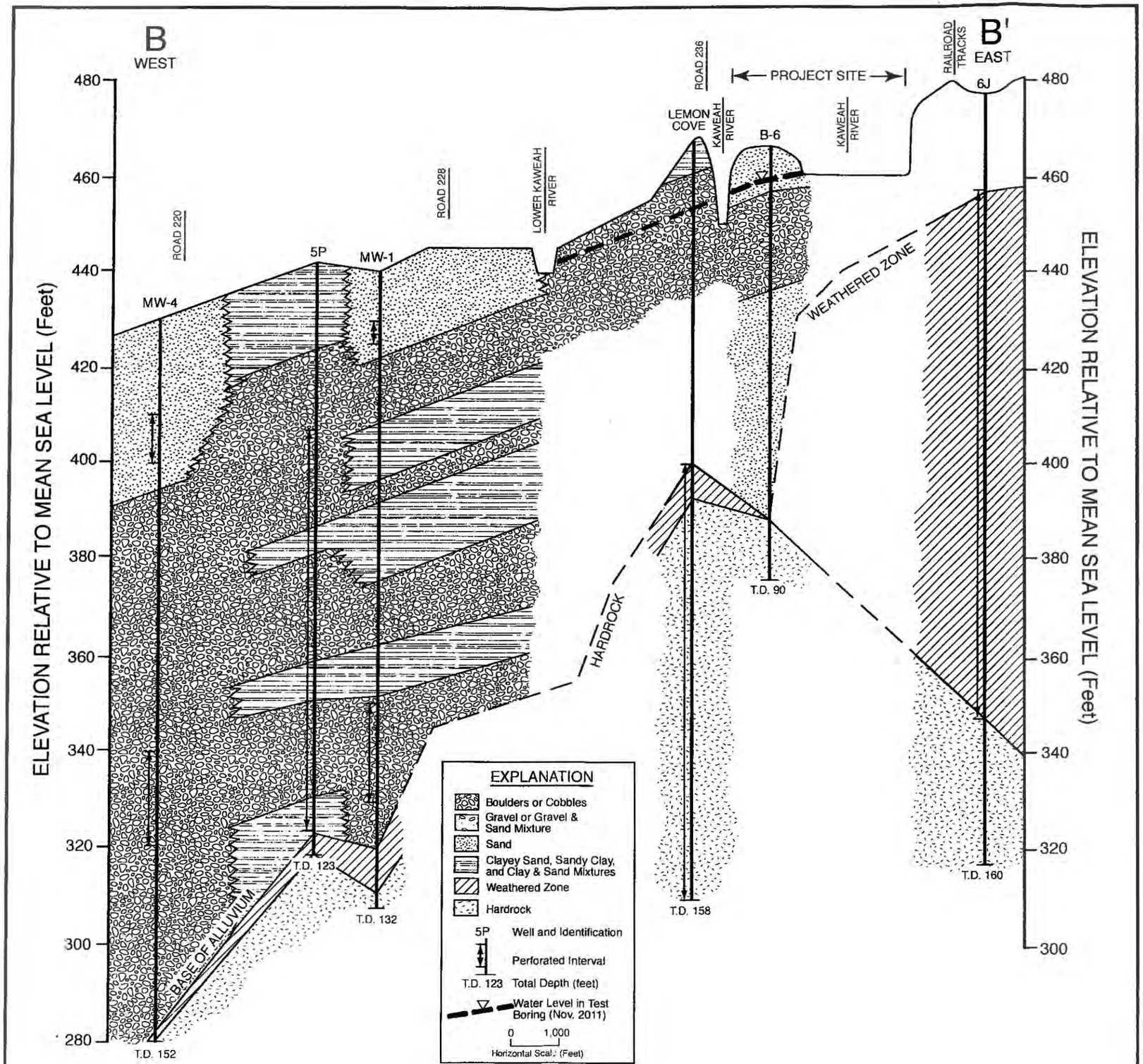


FIGURE 3 - SUBSURFACE GEOLOGIC CROSS SECTION B - B'

C
NORTH

C'
SOUTH

460
440
420
400
380
360
340
320
300
280
260

ELEVATION RELATIVE TO MEAN SEA LEVEL (Feet)

32F
WUTCHUMNA DITCH
ST. JOHNS RIVER
LOWER KAWEAH RIVER
5C 5C
MW-2
MW-1
8H1
BASE OF ALLUVIUM
TOP OF WEATHERED ZONE
TOP OF HARDROCK
WEATHERED ZONE
HARDROCK
T.D. 110
T.D. 130
T.D. 81
T.D. 93
T.D. 132
T.D. 190
O.H. 70

EXPLANATION

- Boulders or Cobbles
- Gravel or Gravel & Sand Mixture
- Sand
- Clayey Sand, Sandy Clay, and Clay & Sand Mixtures
- Clay
- Weathered Zone
- Hardrock
- 32F — Well and Identification
- Perforated Interval
- T.D. 110 — Total Depth (feet)

0 1,000
Horizontal Scale (Feet)

FIGURE 4 - SUBSURFACE GEOLOGIC CROSS SECTION C - C'

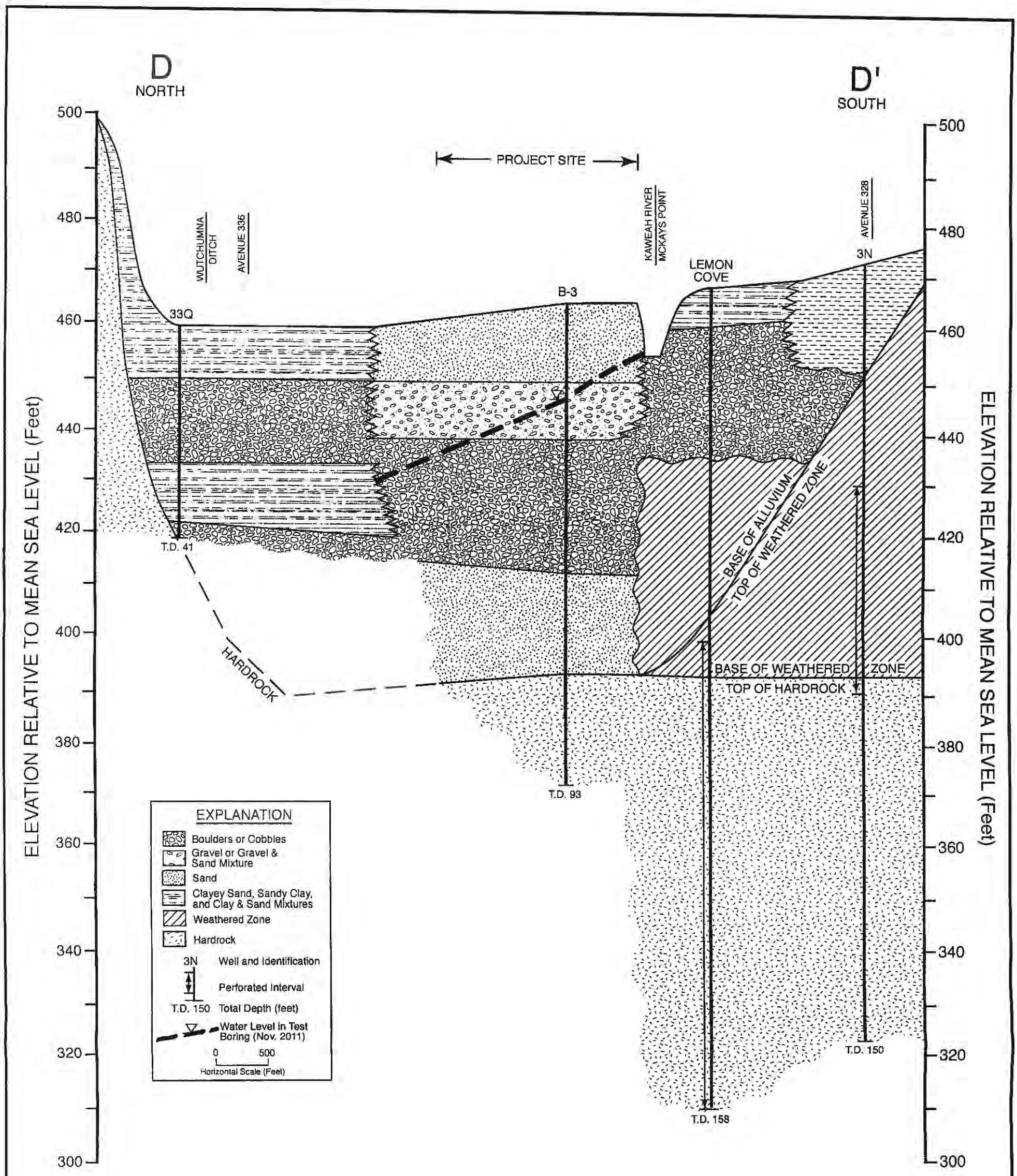


FIGURE 5 - SUBSURFACE GEOLOGIC CROSS SECTION D - D'

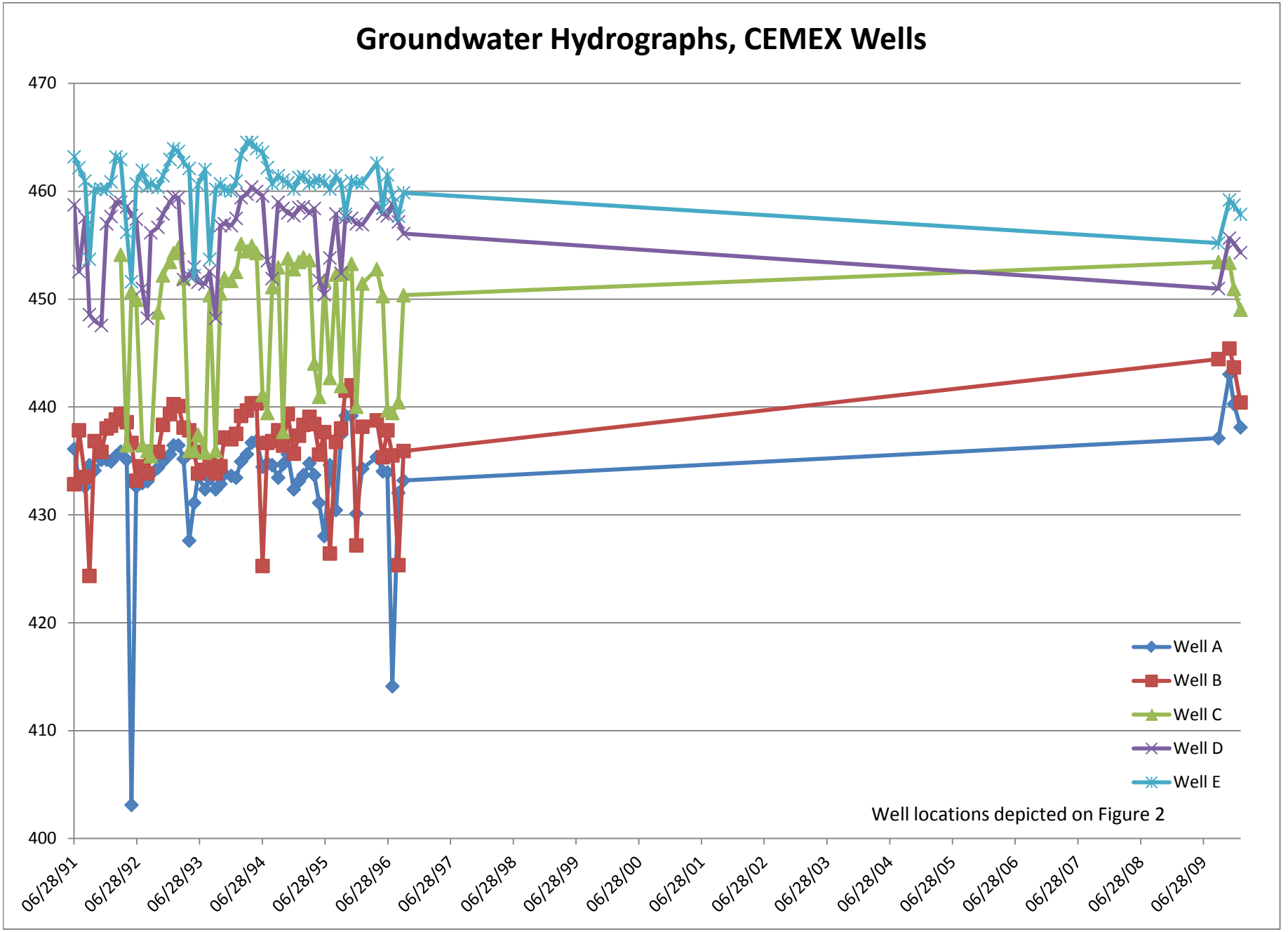
ATTACHMENT B

CEMEX WELLS HYDROGRAPHS

DRAFT



CEMEX Well Locations


Groundwater Hydrographs, CEMEX Wells
470
460
450
440
430
420
410
400
06/28/91
06/28/92
06/28/93
06/28/94
06/28/95
06/28/96
06/28/97
06/28/98
06/28/99
06/28/00
06/28/01
06/28/02
06/28/03
06/28/04
06/28/05
06/28/06
06/28/07
06/28/08
06/28/09
Well A
Well B
Well C
Well D
Well E
Well locations depicted on Figure 2

ATTACHMENT C

FLOODING AND SEDIMENT TRANSPORT MODELING

DRAFT

17701 Cowan, Suite 210
Irvine, CA 92614
Main: (949) 553-8417
Fax: (949) 553-8423

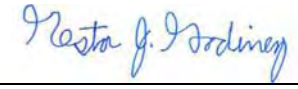
COMPUTATION COVER SHEET

Client: SESPE Consulting, Inc.

Project: McKay Point Reservoir Project **Project:** 117.00981 **Task No.:** 01

Title of Computations: River Analysis

Computations By:



SIGNATURE — 06/17/2016 DATE

Nestor Godinez, P.E. / Senior Staff Engineer
PRINTED NAME AND TITLE

Computations Checked By:

SIGNATURE — 06/17/2016 DATE

Tom Patterson, PhD / Senior Principal
PRINTED NAME AND TITLE

Approved By
(PM or Designate):

SIGNATURE — 06/17/2016 DATE

Ian Hutchison, Ph.D. / Principal
PRINTED NAME AND TITLE

Approval Notes:

Revisions: (Number and Initial All Revisions)

No.	Sheet	Date	By	Checked By	Approval

Written by: NG Date: 2016 / 62/17 Reviewed by: TP Date: 2016 / 06/ 17
YY MM DD YY MM DD

Client: SESPE Project: McKay Point Reservoir Project No: 117.00981 Task No.: 01

RIVER ANALYSIS

MCKAY POINT RESERVOIR, CALIFORNIA

1. PURPOSE AND SCOPE

This computation package documents the river analysis conducted for the Kaweah River east of McKay Point at the proposed McKay Point Reservoir Project Site. Maximum 1% flood peak flows were used to calculate the maximum water surface elevation. A sediment transport analysis of the river bottom was conducted under average maximum monthly flow.

2. ANALYSIS

The Federal Emergency Management Agency (FEMA) in 2009 and 2012 created Flood Insurance Rate Maps for the 1% flood (Attachment 1). The maps show the extents of areas subject to inundation, the floodway which can contain the 1% flood flow, and (for some areas) the flood water elevation contours. The extents of areas subject to inundation were calculated by FEMA for the Kaweah River and the St. Johns River only for the Kaweah River and the St. Johns River west of McKay Point. FEMA did not calculate such flood elevations for areas east of McKay Point, as they often tend to devote their resources to areas with larger populations.

The HEC-RAS hydraulic software package, released by the United States Army Corps of Engineers, was used to simulate the 1% flood flow at the Kaweah River east of McKay Point. The flow is based upon the raised spillway at the Terminus dam. The peak flow at McKay Point is 18,220 cfs. The peak flow was calculated by the United States Army Corps of Engineers.

The topographic data used was from the LiDAR survey conducted for the Tulare and Visalia basin in 2004. A total of 12 cross sections, spaced at a maximum of 1,000 feet apart, were created along the length of 7,600 feet east of McKay Point of the Kaweah River. For purposes of model stability, cross sections were interpolated throughout the reach with sections positions at distances no larger than 75 feet apart. See Figure 1 for the HEC-RAS cross section locations.

A steady state flow analysis was conducted to calculate the water surface elevations for the peak flow of the 1% flood for the Kaweah River east of McKay Point. This analysis was calibrated to tie into the water surface elevations calculated in the prior analyses

conducted by FEMA in 2009. Therefore, SLR's river analysis supplements the analyses conducted by FEMA west of McKay Point.

Roughness coefficients (Manning's "n" values) utilized in the flow analysis were based on similar values from the 2009 FEMA analyses for the Lower Kaweah River just downstream of McKay Point. The channel "n" value of 0.035 and the overbank "n" value of 0.05 were used in SLR's river analysis.

3. SUMMARY AND CONCLUSIONS

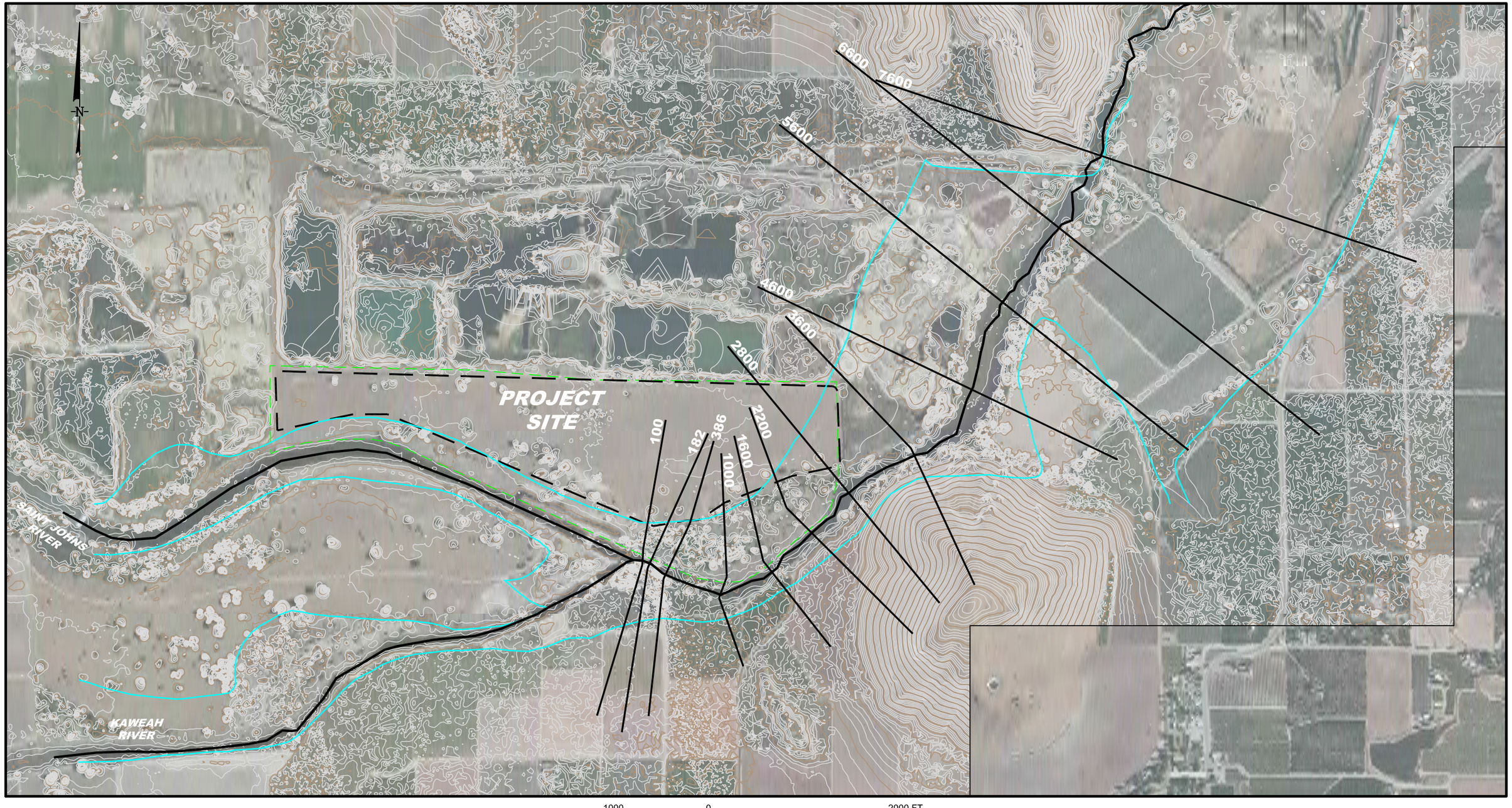
The results of the HEC-RAS steady-state river analysis pre-project are presented in Attachment 2. The results of the HEC-RAS steady-state river analysis post-project are presented in Attachment 3. Results include a summary table and cross section plots of the 12 cross sections.

Figure 2 presents the post-project water surface elevations and floodway for the 1% flood peak flow. SLR's flood calculation results suggest that the floodway for the 1% flood peak flow will not encroach on the proposed reservoir footprint.

REFERENCES

Federal Emergency Management Agency. Flood Insurance Study Tulare County, California and Incorporated Areas. June 2009.

United States Armey Corps of Engineers. HEC-RAS, River Analysis System Hydraulic Reference Manual. Version 4.1. Davis, CA: January 2010.



1000 0 2000 FT

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD) [FEMA 2009, 2012]

HEC-RAS CROSS SECTION LOCATIONS

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS ARE APPROXIMATE

SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

REPORT

CLIENT: **SESPE CONSULTING, INC**

ISSUED DATE: 1/29/15

PROVIDED BY

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Consulting Engineers & Scientists
17701 Cowan Suite 210
Irvine, CA. 92614
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PROJECT: **MCKAY POINT RESERVOIR PROJECT**

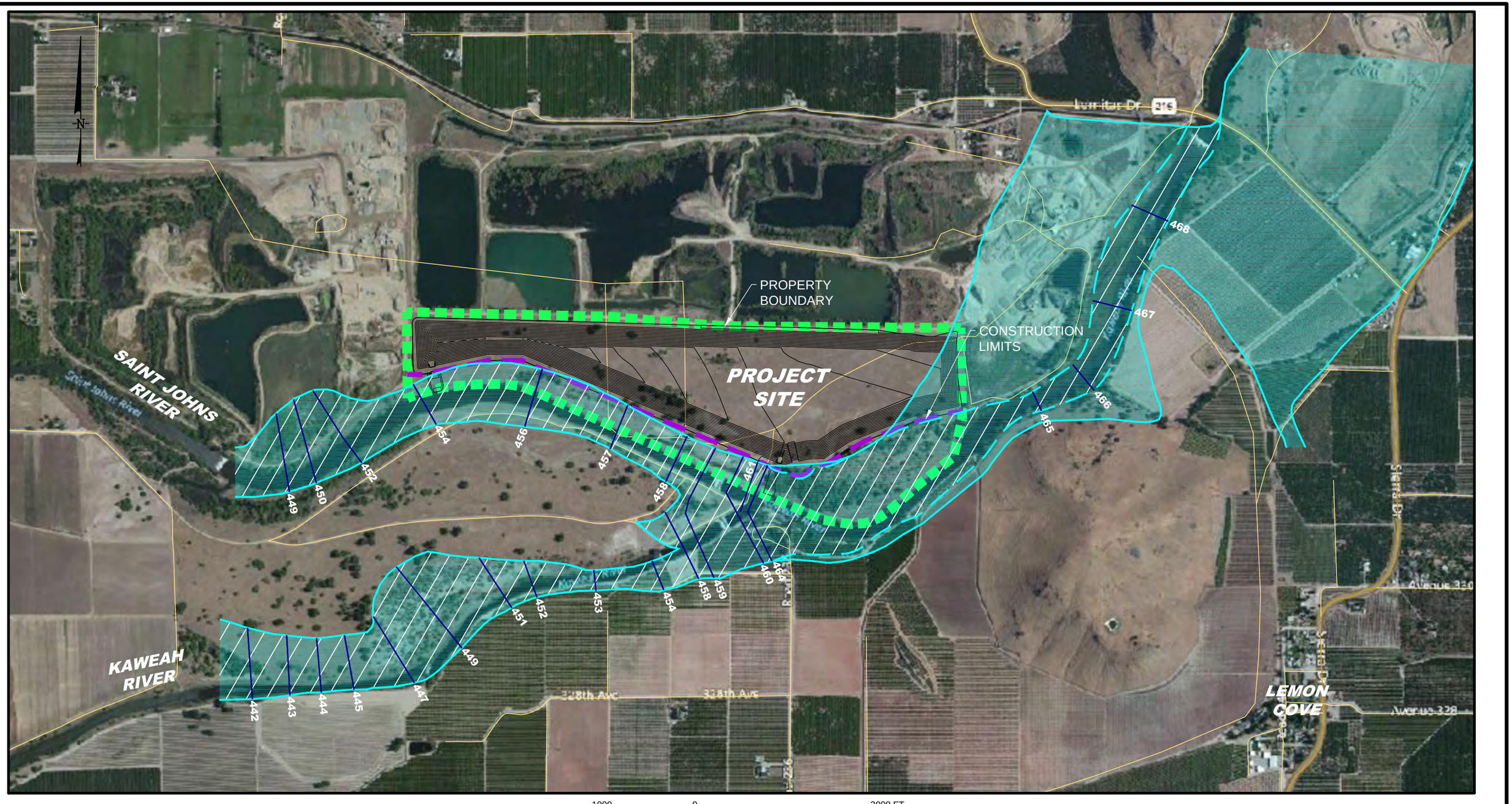
PROJECT No.: 117.00981.00001

TITLE: **HEC-RAS CROSS SECTION LOCATIONS**

FIGURE No.: **01**

REV: A

N:\Irvine\CAD\117.0981.1 McKay Point Reservoir\A01_CAD\A_MODELS\HECRAS\HEC-RAS_CS_LOC.dwg 1/29/2015 10:16 AM



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LEGEND

- SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD) [FEMA 2009, 2012]
- FLOODWAY AREA - SITE-SPECIFIC ANALYSIS [FEMA 2009, SLR 2016]
- FLOOD ELEVATION CONTOUR (FT - MSL)

NOTES

EXTENTS OF SPECIAL FLOOD HAZARD AREAS AND BASE FLOODWAY AREAS ARE APPROXIMATE

SOURCE: FEMA NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP TULARE COUNTY, CALIFORNIA
MAP NUMBER:06107C0695F, DECEMBER 18, 2012
MAP NUMBER: 06107C0693E, JUNE 16, 2009
MAP NUMBER: 06107C0689E, JUNE 16, 2009

REPORT: ----	CLIENT: SESPE CONSULTING, INC	ISSUED DATE: 06/17/16
PROVIDED BY: SLR INTERNATIONAL CORPORATION, Consulting Engineers & Scientists, 17701 Cowan Suite 210, Irvine, CA. 92614, Tel: (949) 553-8417	PROJECT: MCKAY POINT RESERVOIR PROJECT	PROJECT No.: 117.00981.00001
	TITLE: POST-PROJECT FLOOD HAZARD AREA	FIGURE No.: 2 / REV: A

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ATTACHMENT 1

FEMA FLOOD INSURANCE RATE MAPS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1987 or later.

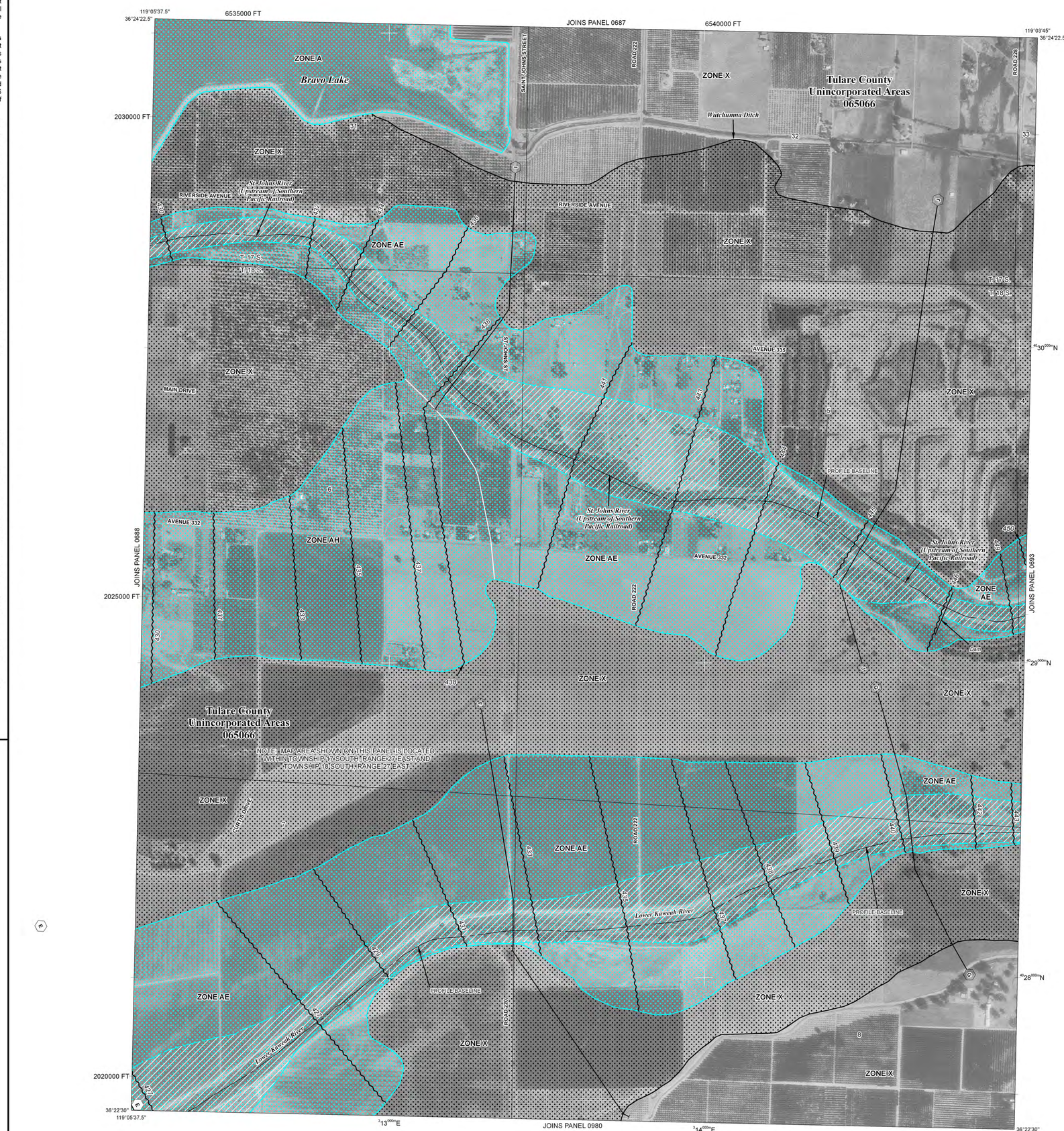
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

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If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2 76 000mN — 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone IV (FIPSZONE 0404), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0689E

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 689 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0689	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0689E

EFFECTIVE DATE
JUNE 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 11. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1987 or later.

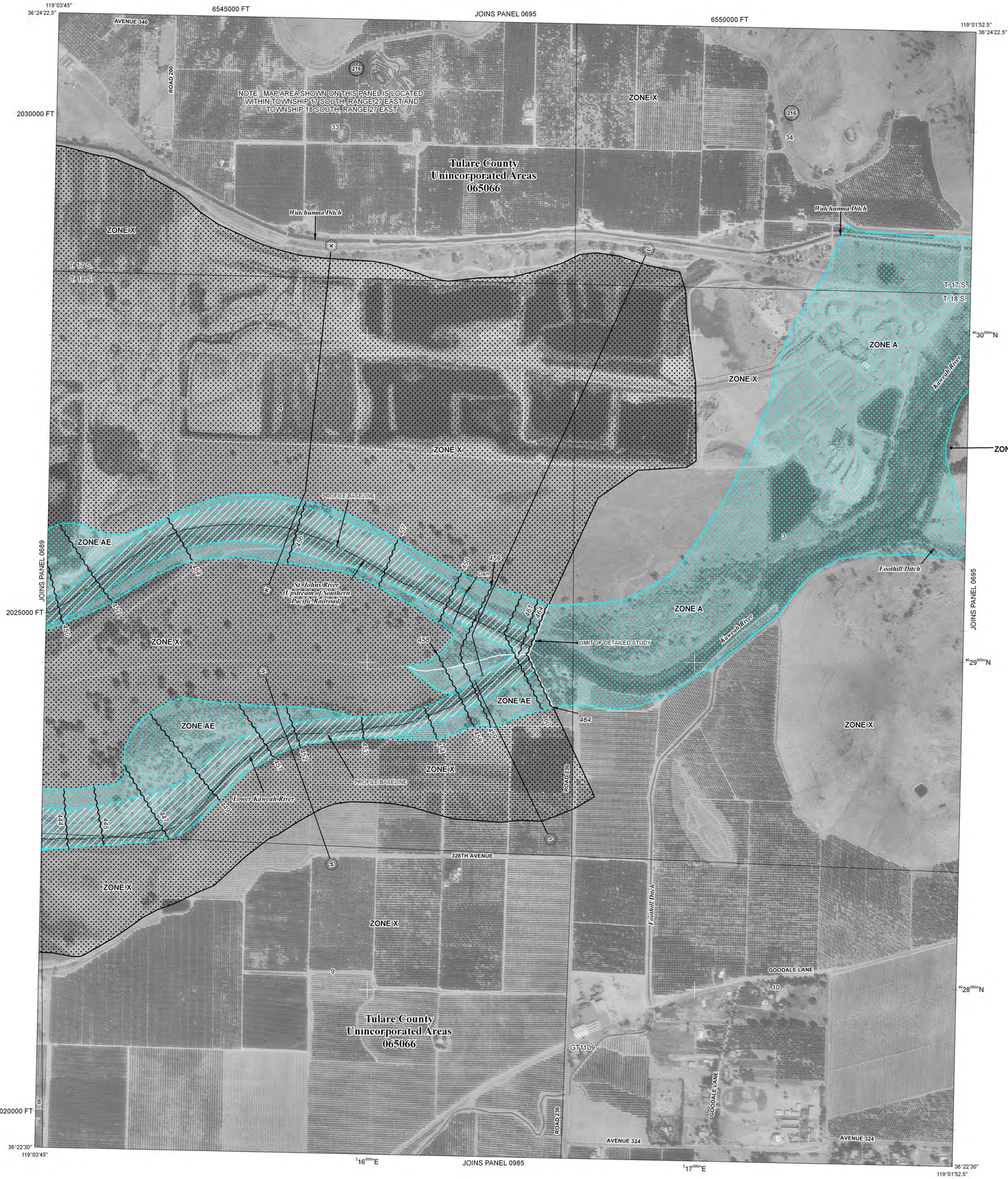
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
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ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
2°76'000mN	1000-meter Universal Transverse Mercator grid values, zone 11
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone IV (FIPSZONE 0404), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0693E

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 693 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0693	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0693E

EFFECTIVE DATE
JUNE 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Silver Spring, Maryland 20910-3282
(301) 713-3242

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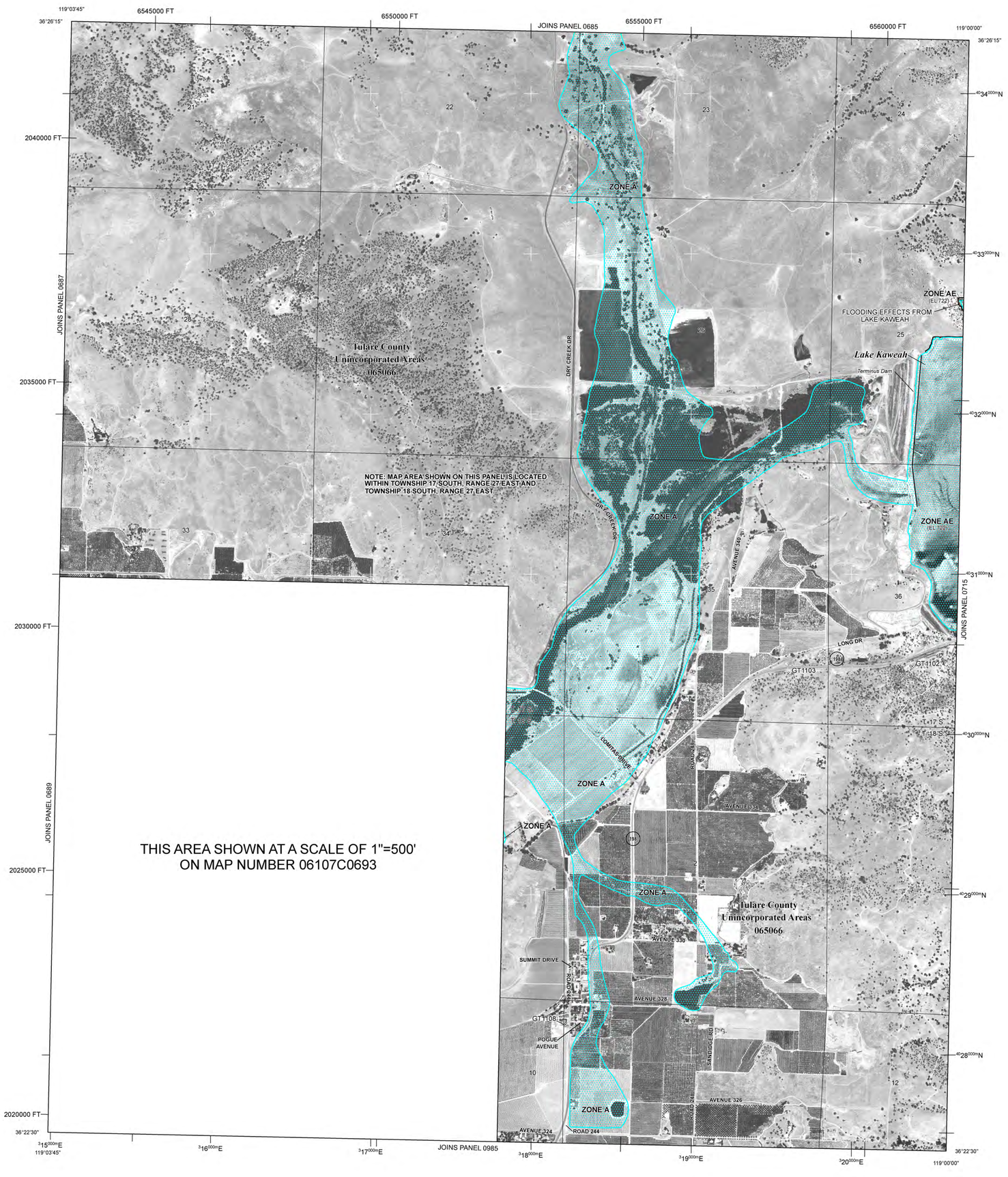
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The "profile base lines" depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the "profile base line", in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

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OTHER AREAS

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OTHERWISE PROTECTED AREAS (OPAs)

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- Floodway boundary
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- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone IV (FIPSZONE = 404), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

December 18, 2012 –to change Base Flood Elevations, Special Flood Hazard Areas, zone designations, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0695F

FIRM

FLOOD INSURANCE RATE MAP

TULARE COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 695 OF 2550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TULARE COUNTY	065066	0695	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06107C0695F

MAP REVISED
December 18, 2012

Federal Emergency Management Agency

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

December 15, 2004

RECEIVED
DEC 21 2004
By

Water Management

Mr. Bruce George
Kaweah Delta Water Conservation District
2975 North Farmerville Blvd.
Farmersville, CA 93223-2303

Dear Mr. George:

This is in response to the request to provide the revised flow at McKay Point for the 1% flood. The revised flow is based upon the raise spillway at the dam. The peak release from the reservoir during this event is 17,900 cfs. The peak flow at McKay Point, including local flow from Dry, Mehrtens, and Yokohl Creeks is 18,220 cfs.

Enclosed is the hourly data for the routing along with 2 plots that show the operation and flows.

If you have any questions, please contact Mr. Wayne Johnson at (916) 557-7139.

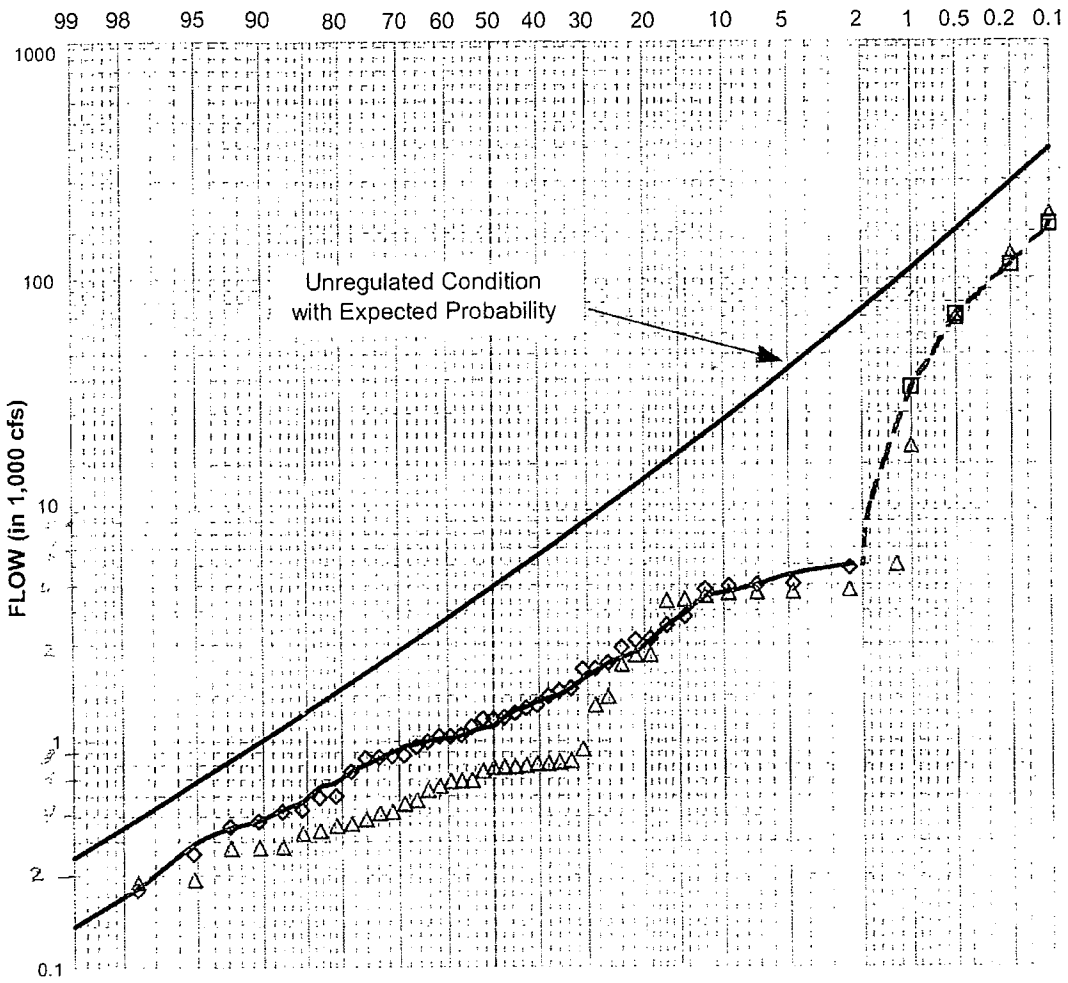
Sincerely,

Wayne L Johnson FOR

Paul E Pugner, PE
Chief Water Management Section

Enclosures

Copies Furnished:
Mr. Joe Countryman
MBK Engineers
2450 Alhambra Blvd., 2nd Floor
Sacramento, CA 95817



NOTES: 1. Drainage Area: 561 sq. mi.

2. Period of Record: 1963-2003

3. △ Hypothetical operation with raised spillway.

TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

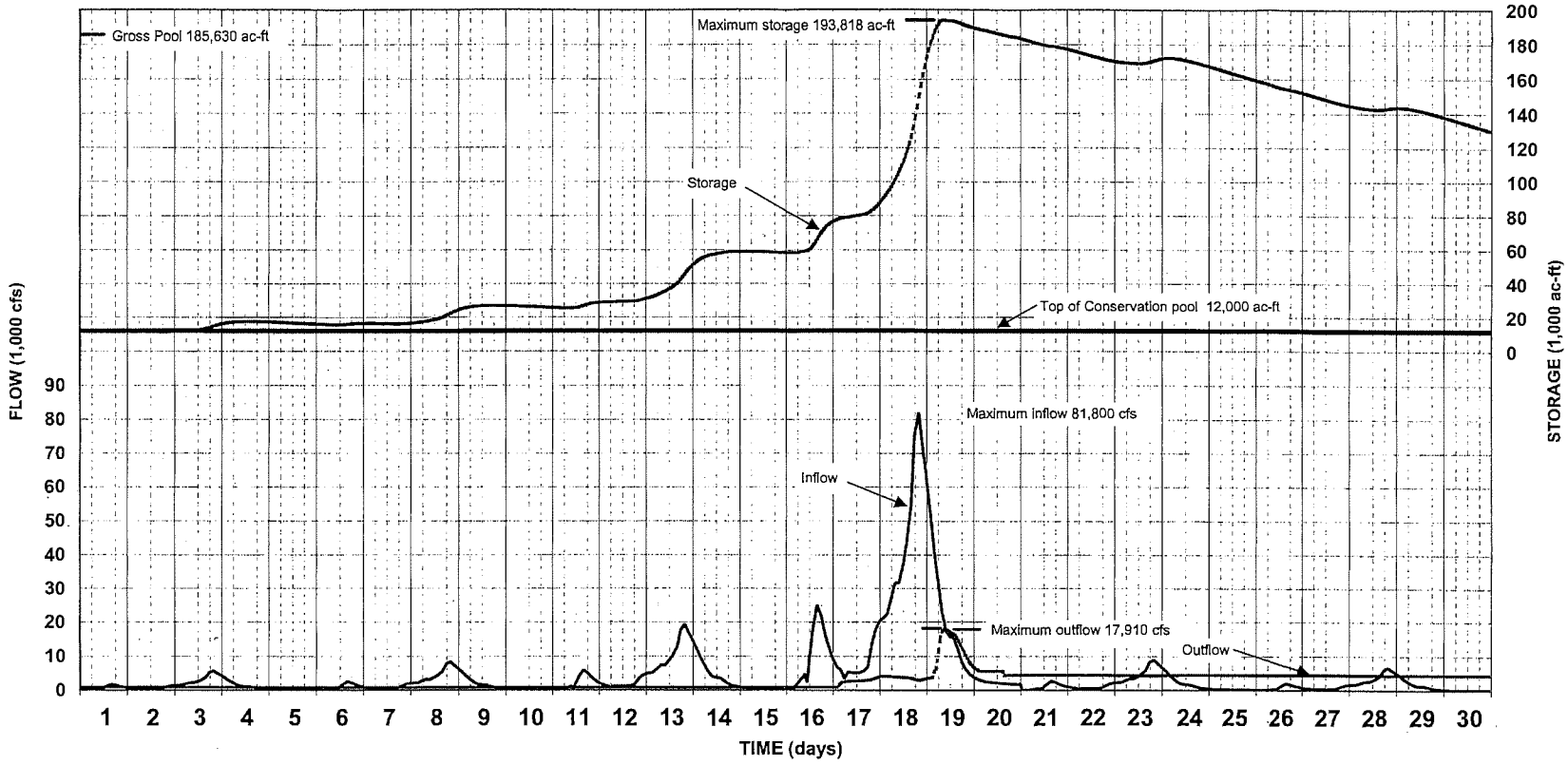
KAWEAH RIVER BELOW TERMINUS DAM
RAIN FLOOD FREQUENCY CURVES
(REGULATED CONDITION)

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

Prepared by WLJ

Revised Dec 2003

PLATE 8-10



TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

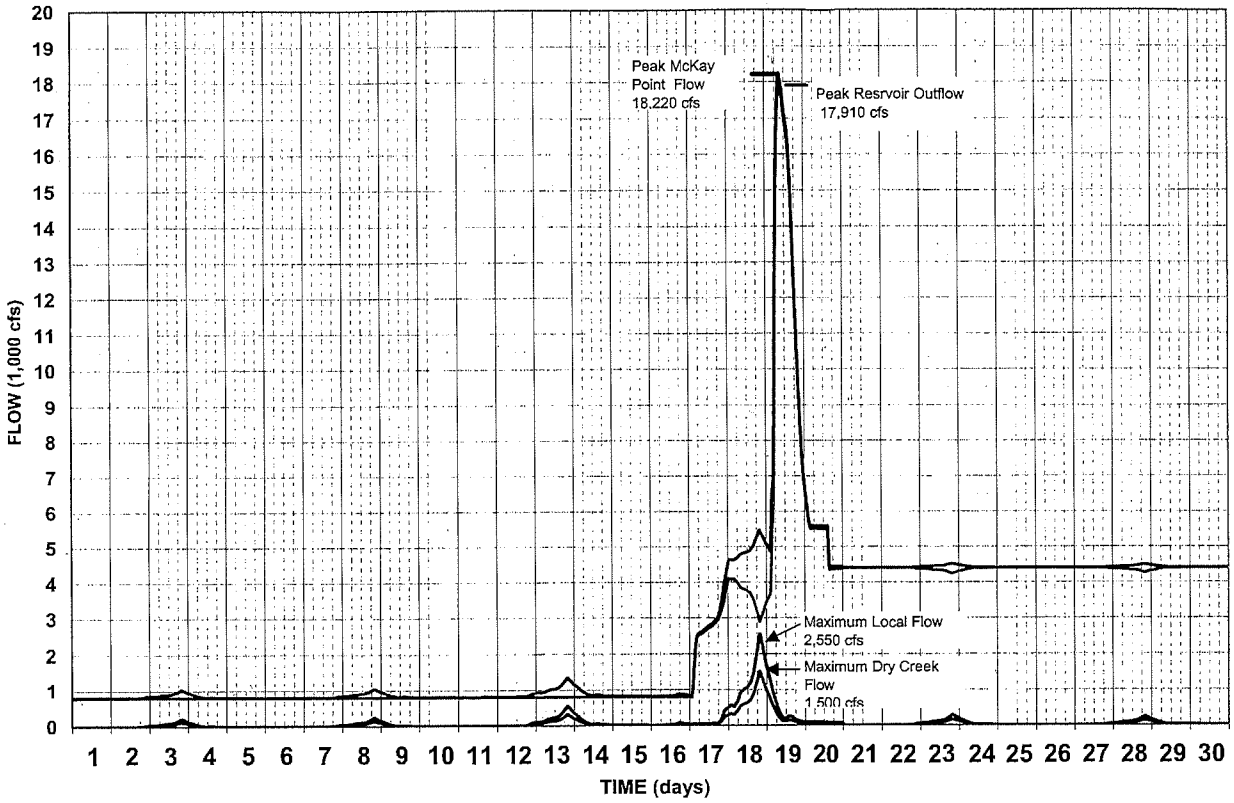
1 PERCENT

FLOOD ROUTING

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

Prepared by WLJ

Dec-03



TERMINUS DAM AND LAKE KAWEAH
KAWEAH RIVER, CALIFORNIA

1 PERCENT

FLOOD ROUTING

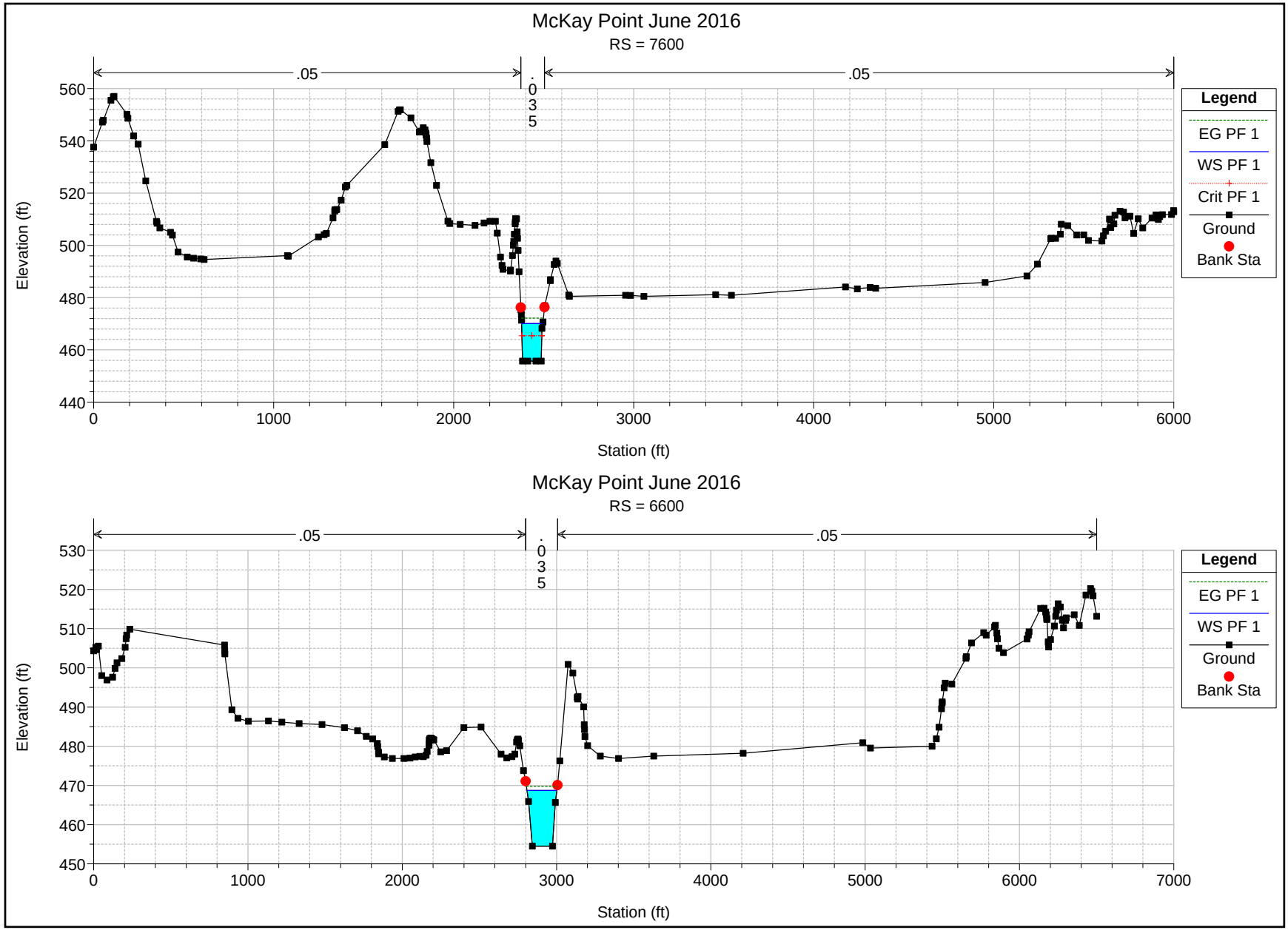
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

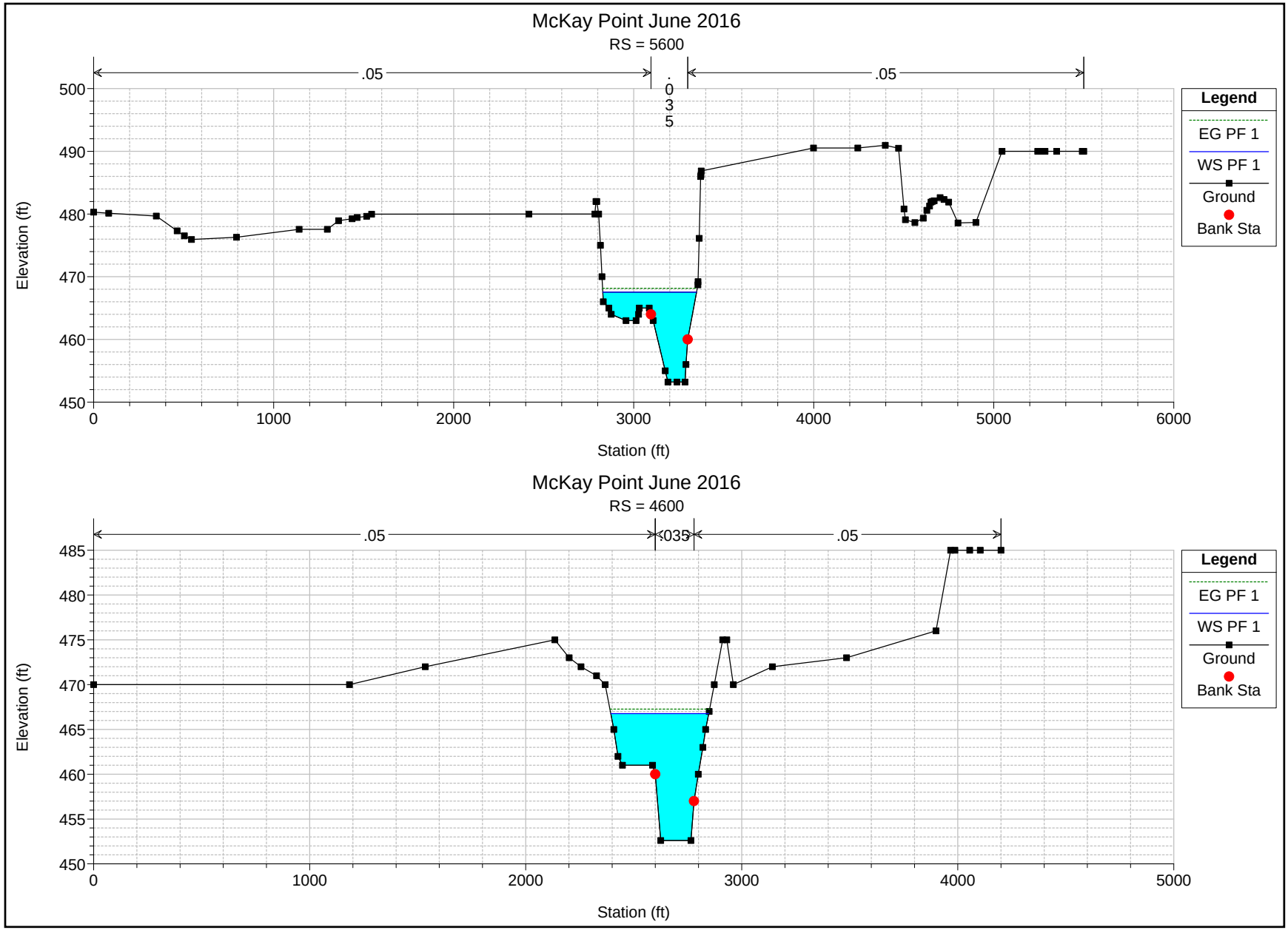
Prepared by WLJ

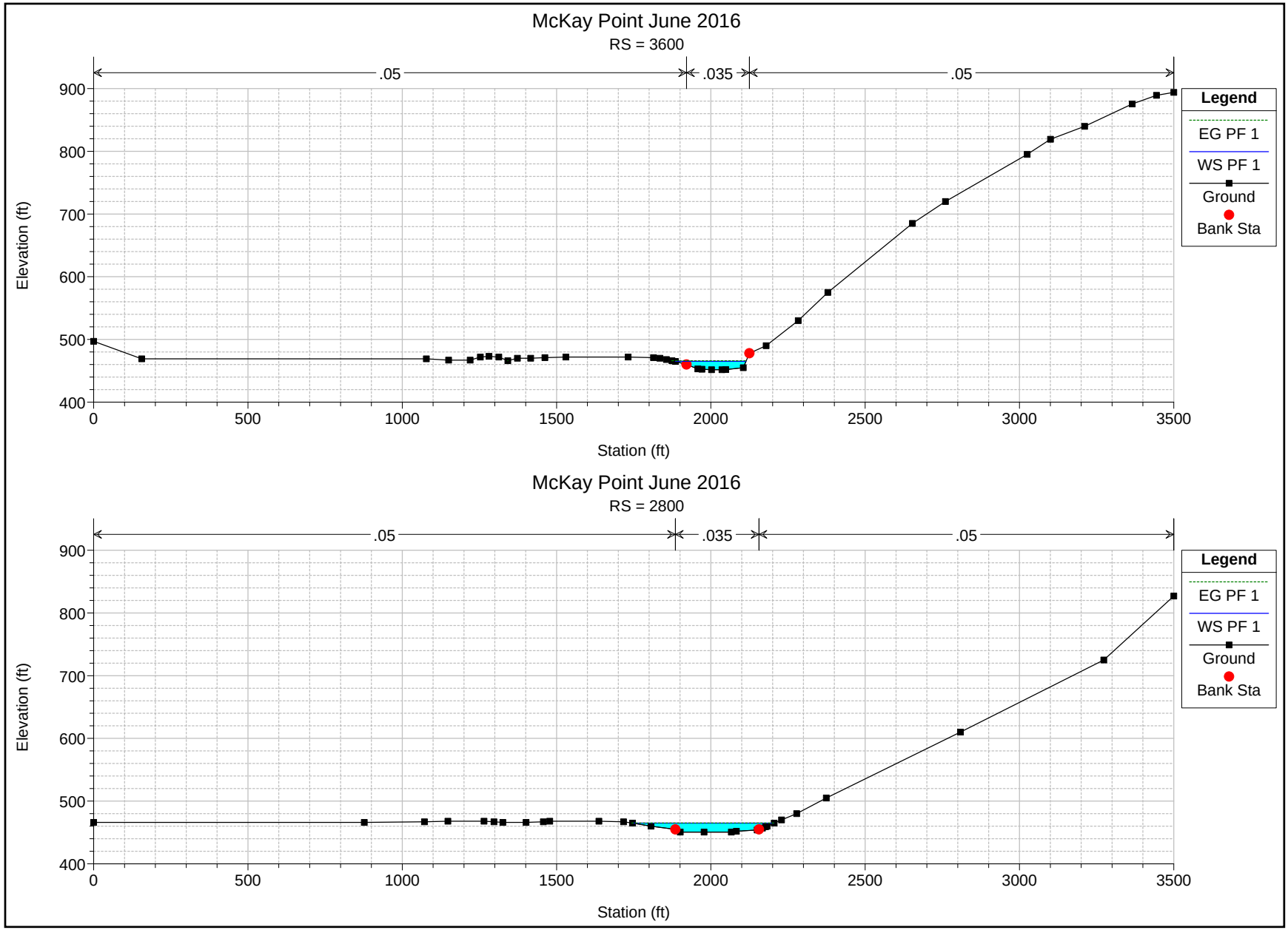
Dec-03

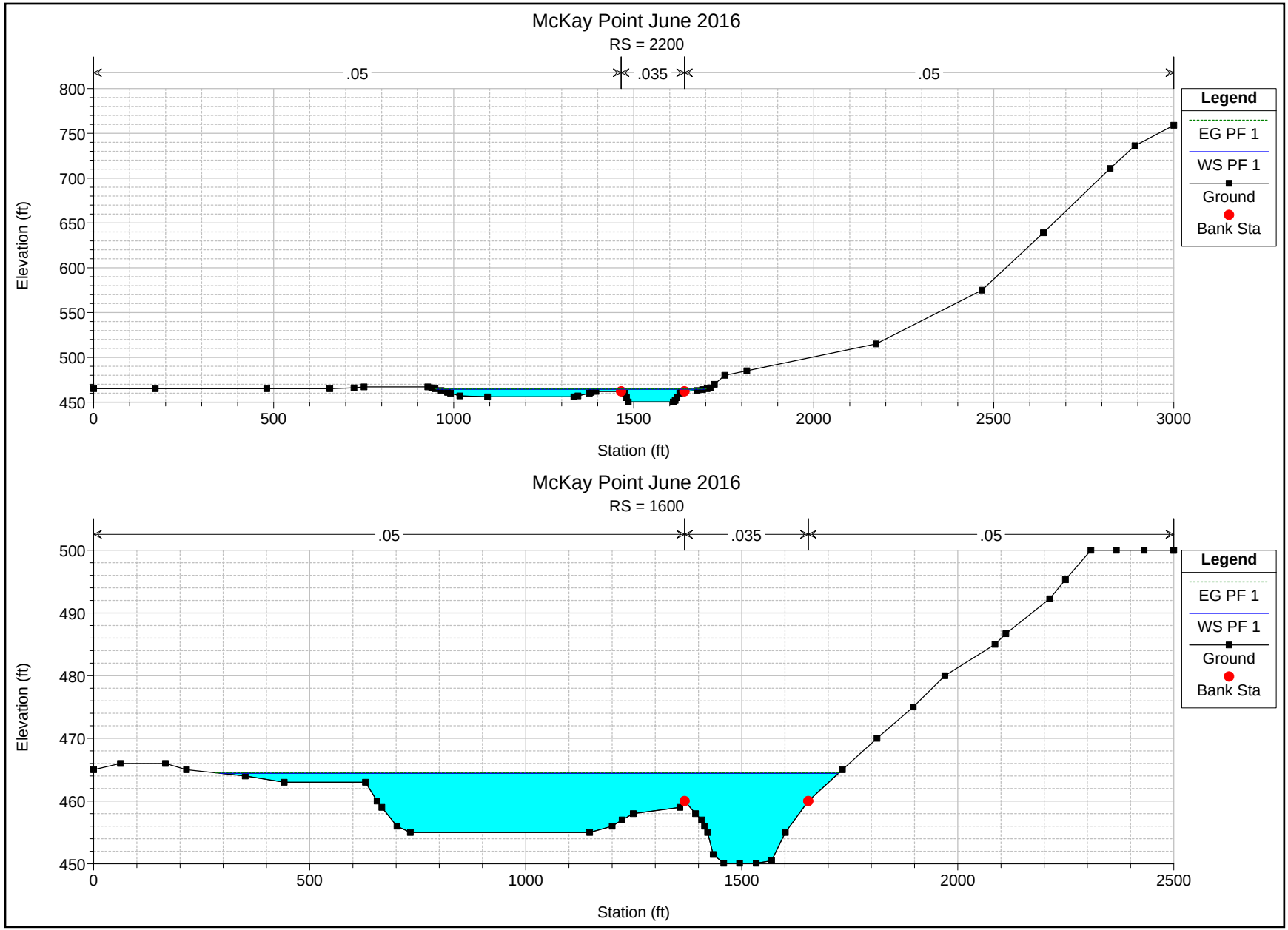
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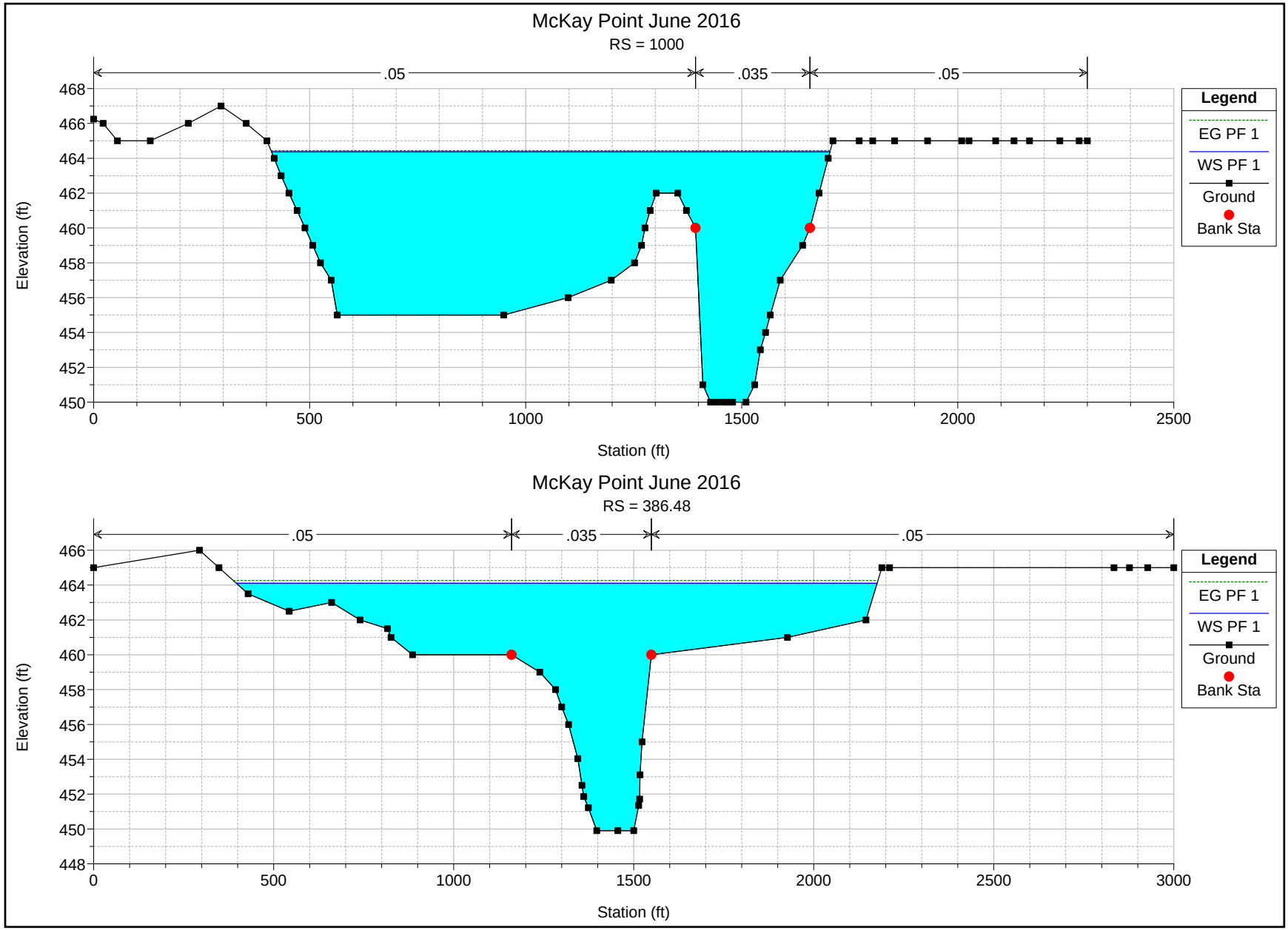
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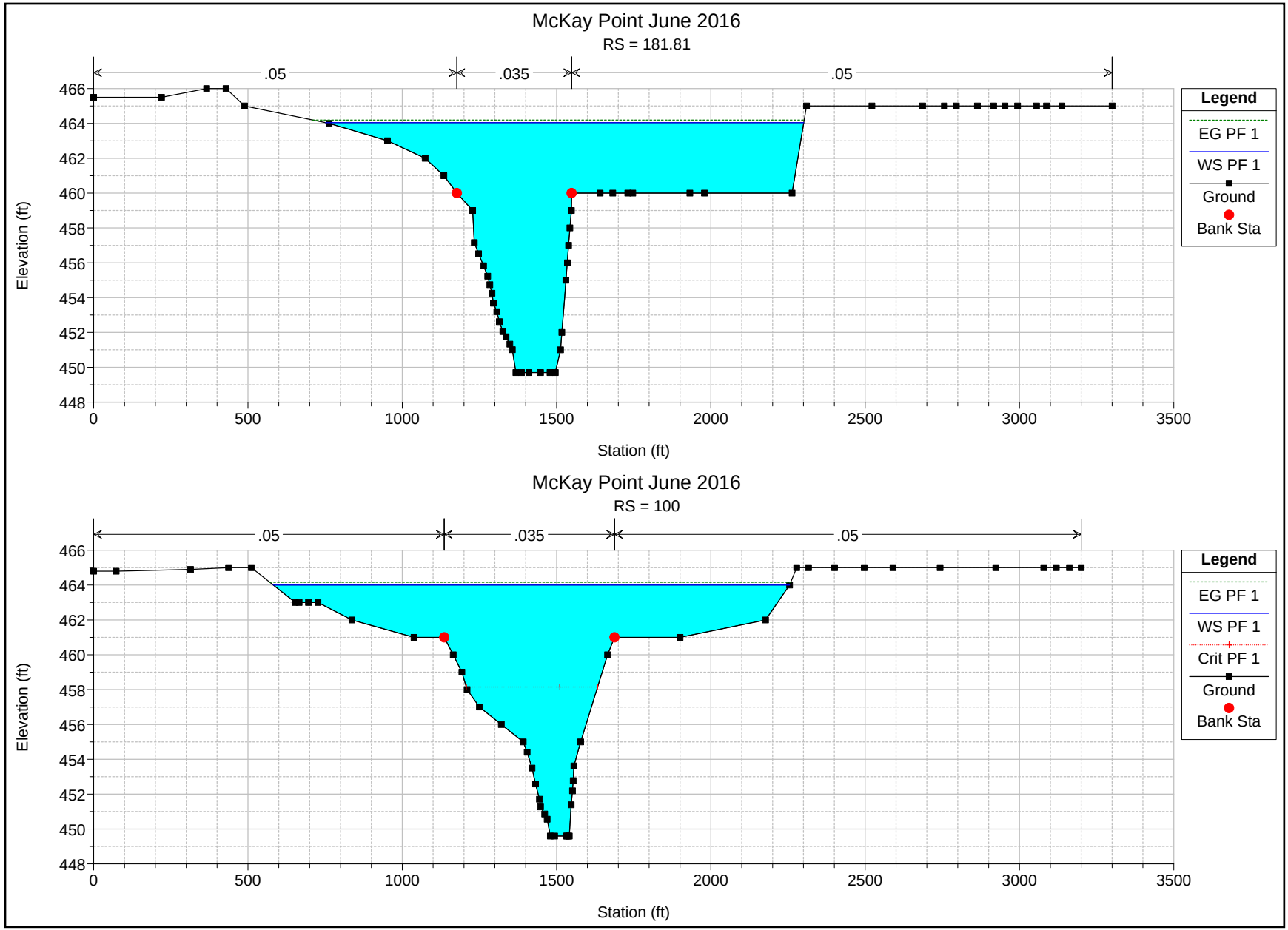

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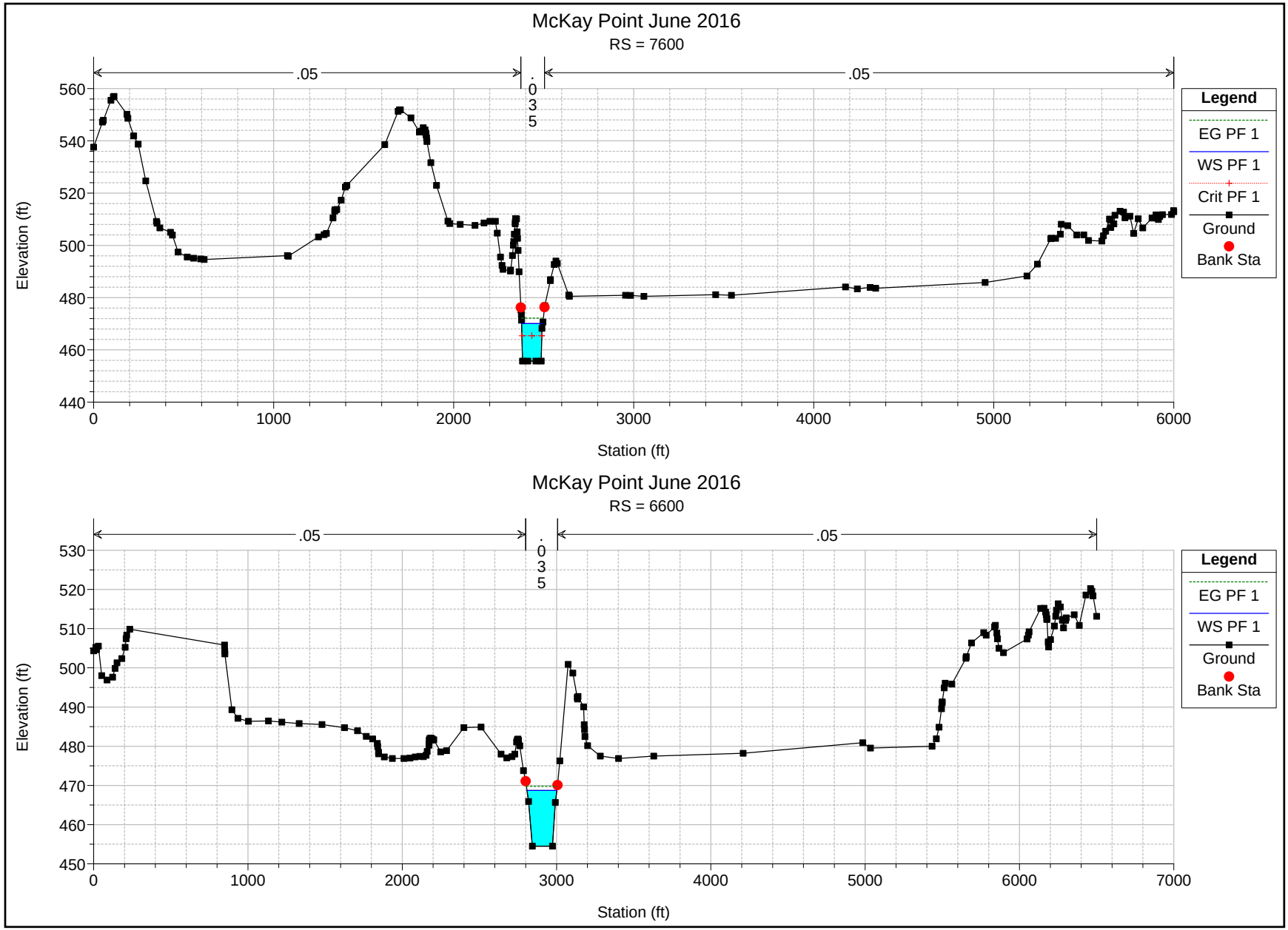

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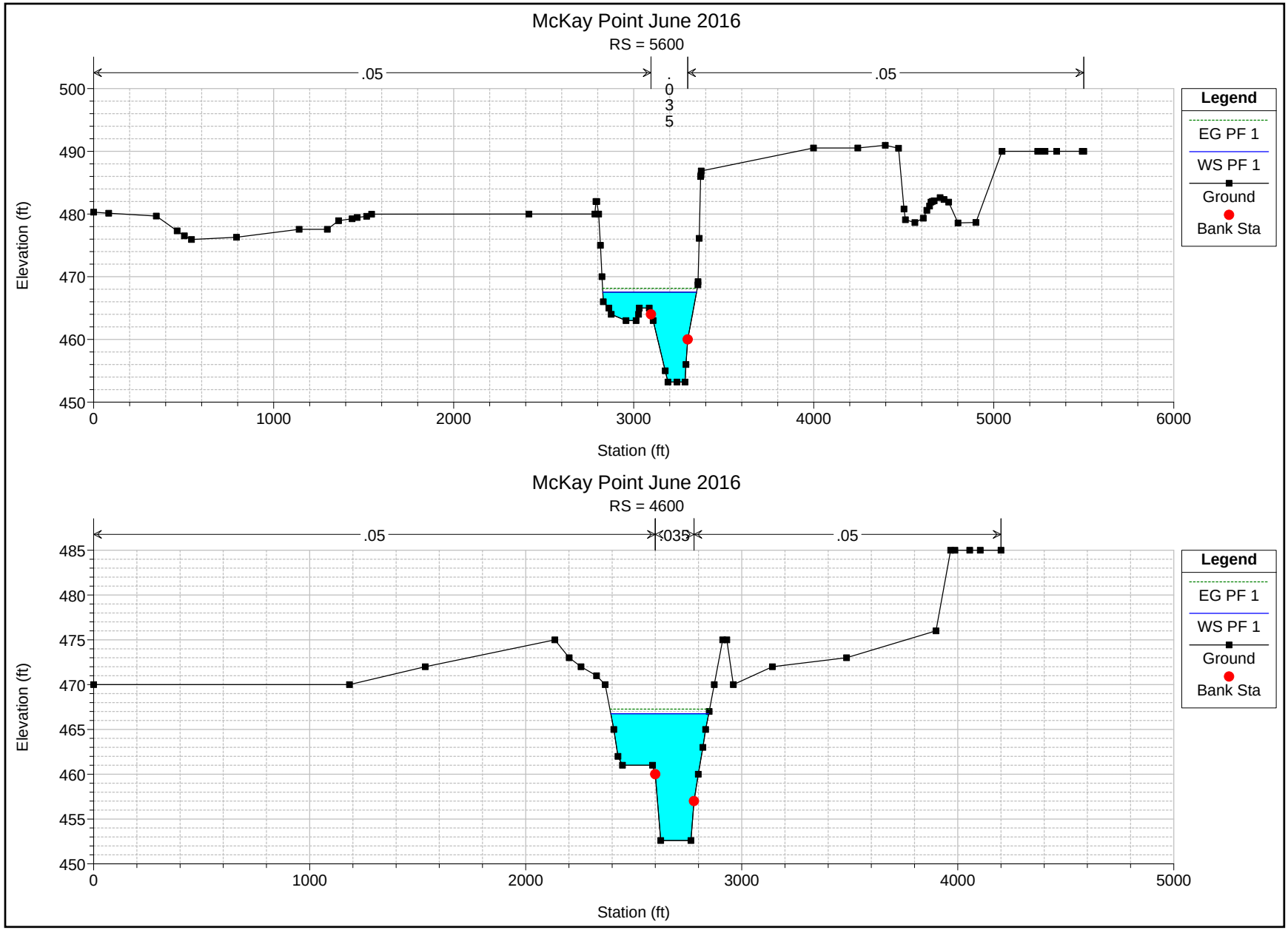
HEC-RAS Plan: Plan 04 River: E CREEK Reach: E Profile: PF 1

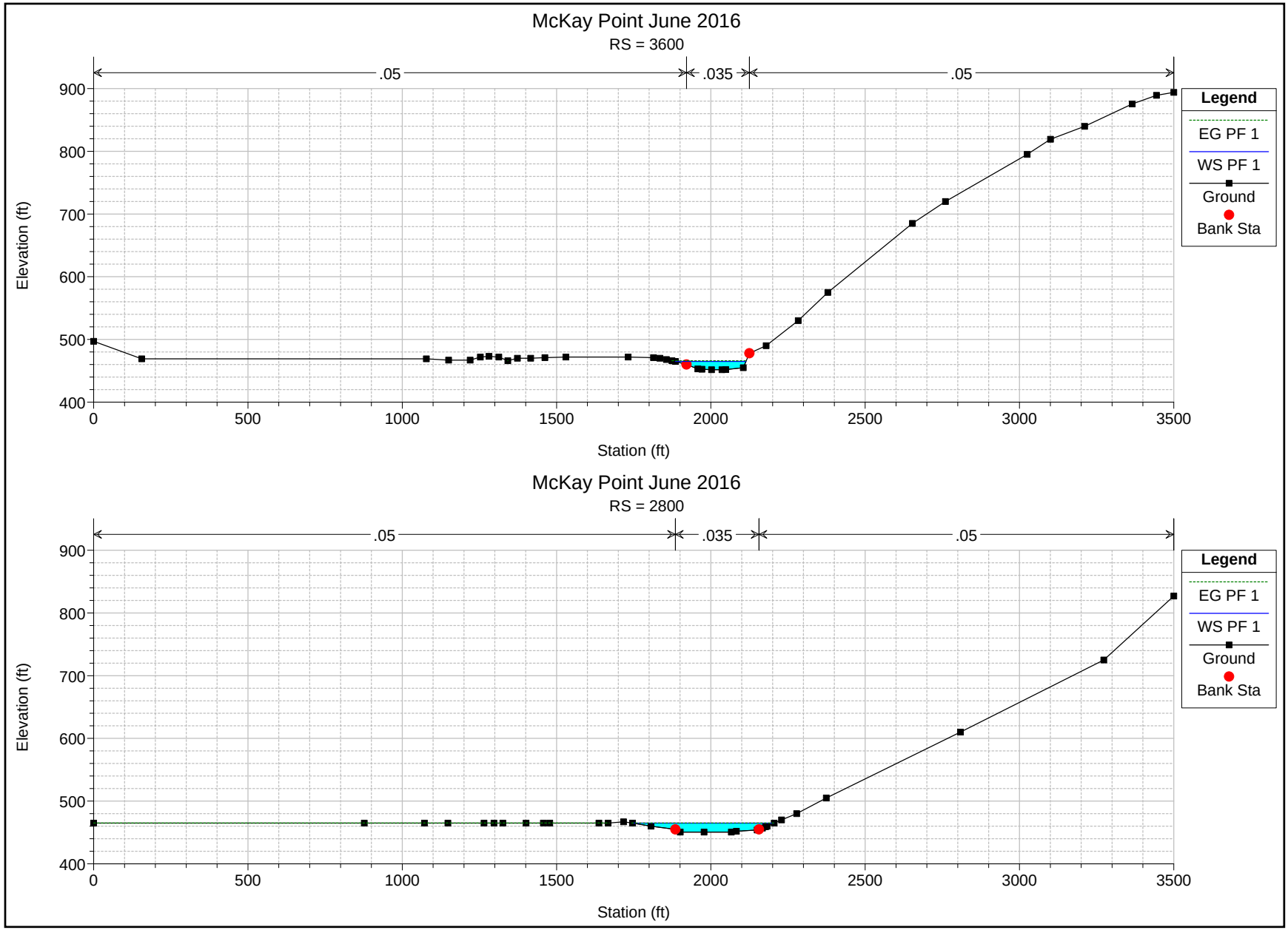
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E	7600	PF 1	18220.00	455.70	470.06	465.43	472.18	0.002941	11.67	1560.99	117.12	0.56
E	6600	PF 1	18220.00	454.50	468.73		469.75	0.001434	8.08	2254.41	193.60	0.42
E	5600	PF 1	18220.00	453.20	467.53		468.16	0.000990	6.75	3454.99	520.75	0.35
E	4600	PF 1	18220.00	452.60	466.76		467.27	0.000682	6.24	3802.28	453.17	0.30
E	3600	PF 1	18220.00	451.80	465.03		466.07	0.001534	8.24	2277.56	229.00	0.43
E	2800	PF 1	18220.00	450.60	464.88		465.18	0.000362	4.55	4613.07	457.03	0.22
E	2200	PF 1	18220.00	450.20	464.55		464.78	0.000474	4.77	5674.17	746.32	0.24
E	1600	PF 1	18220.00	450.10	464.43		464.52	0.000196	2.93	9761.29	1432.10	0.16
E	1000	PF 1	18220.00	450.00	464.37		464.44	0.000168	2.67	10183.60	1292.40	0.14
E	386.48	PF 1	18220.00	449.90	464.10		464.27	0.000383	3.71	7612.40	1779.54	0.21
E	181.81	PF 1	18220.00	449.70	464.04		464.20	0.000283	3.50	7605.83	1549.64	0.19
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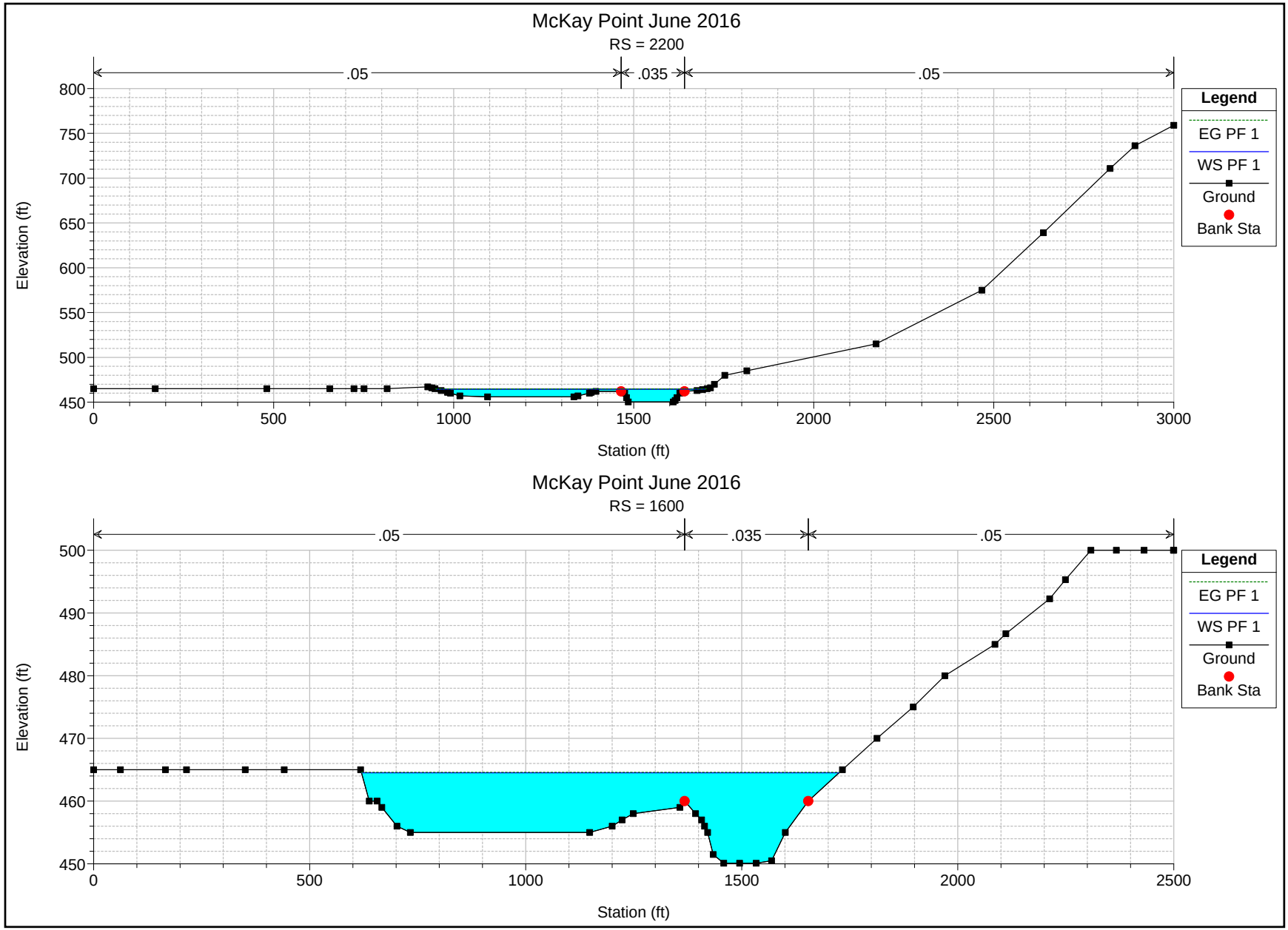
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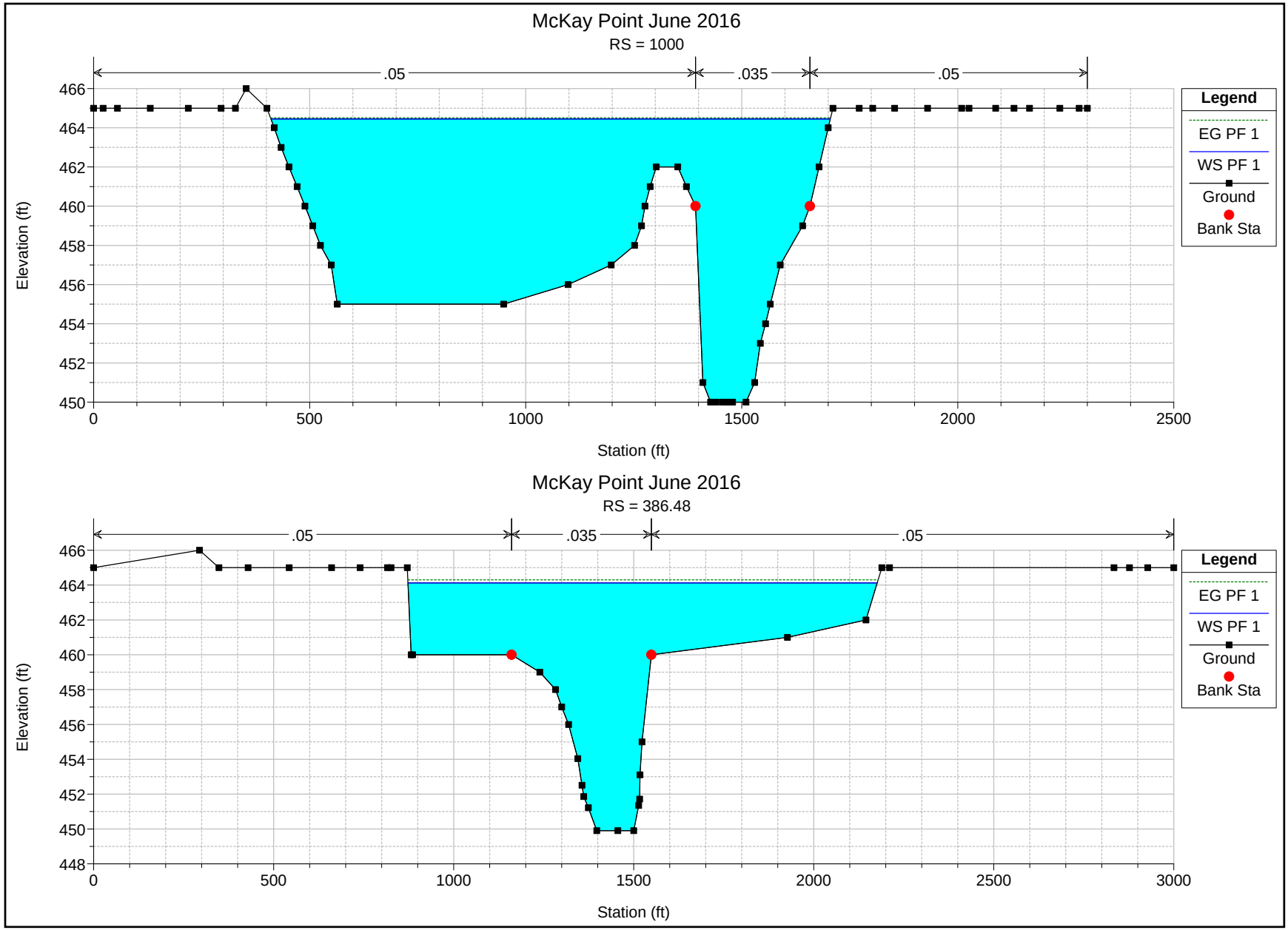
HEC-RAS RESULTS
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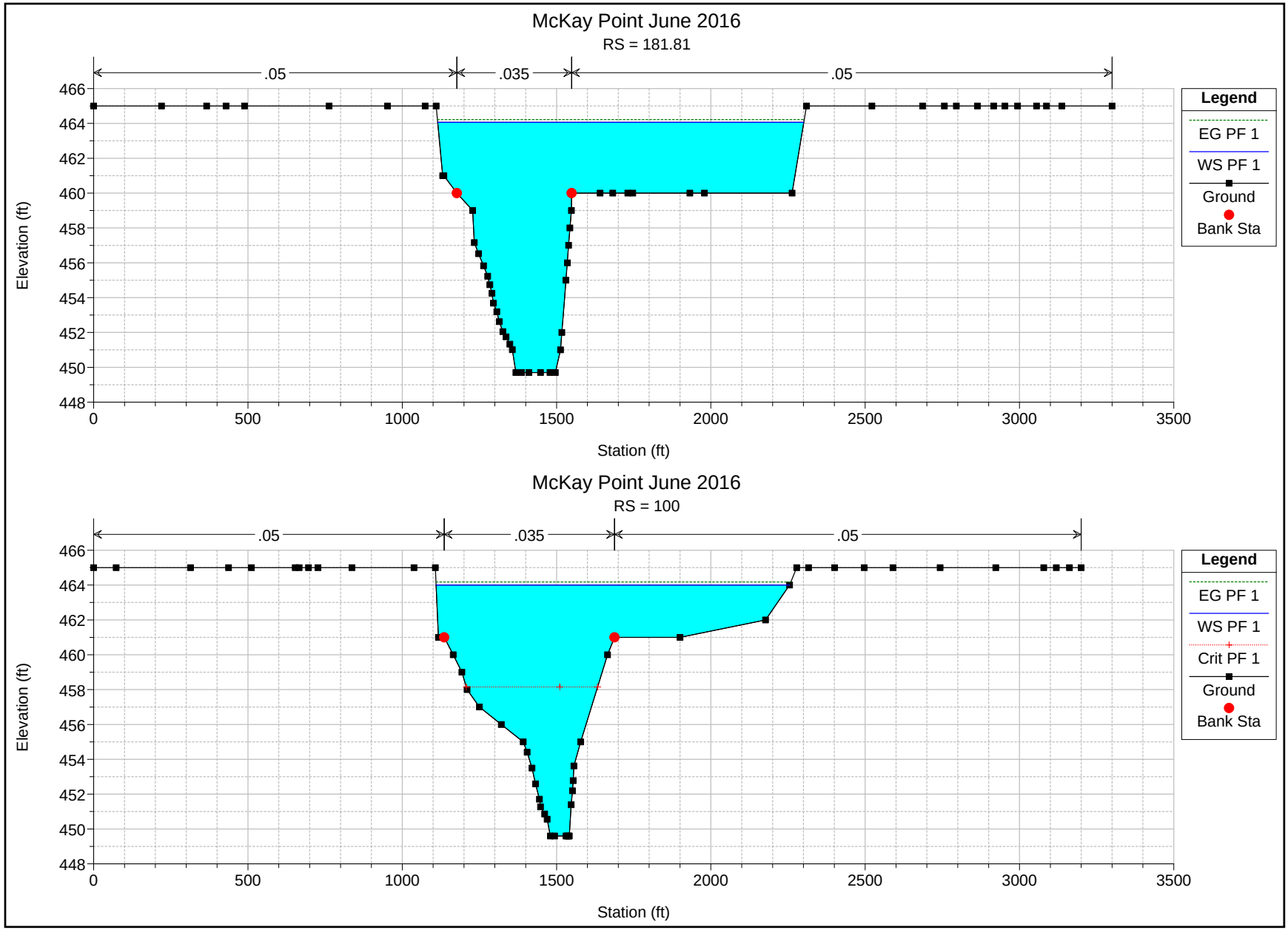

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HEC-RAS Plan: Plan 03 River: E CREEK Reach: E Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
E	7600	PF 1	18220.00	455.70	470.06	465.43	472.18	0.002942	11.67	1560.72	117.11	0.56
E	6600	PF 1	18220.00	454.50	468.73		469.74	0.001435	8.08	2253.66	193.57	0.42
E	5600	PF 1	18220.00	453.20	467.53		468.15	0.000992	6.76	3451.75	520.69	0.35
E	4600	PF 1	18220.00	452.60	466.75		467.27	0.000684	6.24	3798.63	453.04	0.30
E	3600	PF 1	18220.00	451.80	465.01		466.06	0.001540	8.25	2274.40	228.84	0.43
E	2800	PF 1	18220.00	450.60	464.87		465.16	0.000363	4.56	4606.13	456.78	0.22
E	2200	PF 1	18220.00	450.20	464.59		464.82	0.000468	4.75	5701.97	747.12	0.24
E	1600	PF 1	18220.00	450.10	464.52		464.59	0.000163	2.69	9525.45	1105.42	0.14
E	1000	PF 1	18220.00	450.00	464.45		464.51	0.000163	2.64	10279.92	1294.49	0.14
E	386.48	PF 1	18220.00	449.90	464.12		464.30	0.000399	3.79	6824.37	1303.21	0.22
E	181.81	PF 1	18220.00	449.70	464.06		464.22	0.000286	3.52	7222.06	1186.29	0.19
E	100	PF 1	18220.00	449.60	464.00	458.15	464.18	0.000409	3.56	6138.73	1145.50	0.22

ATTACHMENT 4

RIVERBED ANALYSIS

Written by: SB Date: 2016 / 06/ 24 (YY MM DD) Reviewed by: TP Date: 2016 / 06/ 24 (YY MM DD)

Client: SESPE Project: McKay Point Reservoir Project No: 117.00981 Task No.: 01

RIVERBED ANALYSIS

MCKAY POINT RESERVOIR, CALIFORNIA

1. PURPOSE AND SCOPE

This attachment documents the riverbed analysis conducted for the Kaweah River and the St. Johns River at the proposed McKay Point Reservoir Project site. The McKay Point Reservoir Project involves the creation of a topographic depression that will capture precipitation and some storm water runoff. The Project will not involve placing structures in the St. Johns or Kaweah River channels and will not alter the course of either river. The only changes to the river channels will be placement of rip rap at the Inflow and Outflow Channels, and construction of the Inflow and Outflow Channels. The rip rap will be placed below the elevation of the main river channels, and the Inflow/Outflow Channels will be set back from the main river channels. These structures are designed to avoid impedance of river flows.

2. ANALYSIS

SLR reviewed historical aerial photos of the riverbeds of the Kaweah and St. Johns Rivers and the surrounding areas. The aerial photos from the years 1954, 1956, 1969, 1974, 1984, 1989, 1994, and 2002 were obtained from Environmental Data Resources, Inc. (EDR, 2014). The aerial photos from the years 2003, 2004, 2005, 2006, 2009, 2010, 2011, 2012, and 2014 were obtained from Google Earth. The photos were reviewed to determine if major scouring or changes to the morphology of the Kaweah and St. Johns Rivers had occurred near the McKay Point Reservoir Project site in the past. The 1954 and 1956 photos show that the size and shape of the river channels varied with the weather conditions and the corresponding flow volumes that occurred at the time. However, starting with the 1969 photo, no significant changes can be observed. Terminus Dam was constructed in 1962, and regulates flows and flooding, and thus river morphology and scouring. Rapid changes in river morphology and scouring have therefore been minimized. Terminus Dam is used extensively to manage flow rates in the rivers and to avoid flow rates that would result in extensive scouring.

3. SUMMARY AND CONCLUSIONS

SLR has conducted a review of historical aerial photographs of the McKay Point Reservoir Project site and the surrounding areas to identify whether the Kaweah and St. Johns Rivers have moved or changed course significantly in the past sixty years. The results of this riverbed analysis are presented in a series of figures in which the 2014 aerial image is overlaid by sketches of the historical outlines of the river channels from the selected years of 1956, 1969,

1974, 1984, 1994, 2002, 2005, and 2014. Based on this evaluation, SLR concludes that the riverbeds of the Kaweah and St. Johns Rivers have not moved significantly since construction of Terminus Dam in 1962.

It is anticipated that during reservoir operations, flow rates in the St. Johns and Kaweah Rivers will remain within the existing range of typical flow rates that are currently managed through outflows of Terminus Dam. Use of the reservoir for flood storage may actually cause flow rates in the Kaweah and St. Johns Rivers to decrease during periods of high precipitation, thereby reducing scour potential. Thus, SLR also concludes that the riverbeds of both the Kaweah and St. Johns Rivers would not move as a result of the McKay Point Reservoir Project.

4. REFERENCES

Environmental Data Resources, Inc. (EDR), 2014, The EDR Aerial Photo Decade Package – McKay Point Reservoir Project, Inquiry Number: 4044498.5, August 26.

Federal Emergency Management Agency (FEMA). Flood Insurance Study Tulare County, California and Incorporated Areas. June 2009.

Kaweah and St. Johns Rivers Association (Watermaster), 1991-2007, Annual Report.

ATTACHMENT D

SEEPAGE CALCULATIONS

DRAFT

D.1 INTRODUCTION

Seepage calculations were performed to determine the amount of groundwater inflow into the excavated reservoir, both with and without the proposed slurry wall. These analyses were conducted using two methods, i.e.:

- Simplified Two-dimensional (2-D) analyses; and
- A conceptual level Three-dimensional (3-D) analysis as a check on the 2-D modleing and also to assess the likely impacts of the project on the groundwater levels surrounding the Reservoir.

Tw sets of analyses were performed as a check on the range of potential values that could be generated. The details of the modeling work and the results are provided in Sections D.2 and D.3 bellow. The overall key results are as follows:

Table D1-1 Summary of Excavation and Reservoir Inflow Rates

PROJECT STAGE	CONDITIONS	SLURRY WALL	INFILTRATION TRENCH	2-D MODELLING (GPM)	3-D MODELLING (GPM)	RECOMMENDED FOR USE IN ENVIRONMENTAL ANALYSES (GPM)	RATIONAL
Excavation / Reservoir	Final Excavation Empty Reservoir	No	No	0	0	0	
	Initial Excavation Full Reservoir	No	No	659	830	800	Reasonable average value
	Final Excavation Empty Reservoir	Yes	No	0	0	0	
	Initial Excavation Full Reservoir	Yes	Yes	220	74-174[1]	220	More conservative value

NOTES: (1) Depending on the depth of penetration of the slurry wall

Table D1-2 Summary of Impacts to Surrounding Groundwater Levels (Based on 3-D Groundwater Flow Modeling)

PROJECT STAGE	CONDITIONS	SLURRY WALL	INFILTRATION TRENCH	MAXIMUM GROUNDWATER LEVEL IMPACTS (FEET) MODELED UP TO 500 FEET FROM THE SLURRY WALL (OR EDGE OF EXCAVATION)		
				UPSTREAM / EAST	NORTH	DOWNSTREAM / WEST
Excavation / Reservoir	Final Excavation Empty Reservoir	No	No	-14 to -24	-49 to -52	-28 to 44
	Initial Excavation Full Reservoir	No	No	0	0	0
	Final Excavation Empty Reservoir	Yes	Yes	0	--2	-3
	Initial Excavation Full Reservoir	Yes	Yes	0	0	0

D.2 TWO DIMENSIONAL ANALYSES

D.2.1 INTRODUCTION

Two geologic cross sections across the reservoir were developed based on the boring logs available and a review of available information about the site. These two geologic cross sections are presented in Attachment A of the Technical Memorandum prepared by SES (SES, 2012). Based on these geologic cross sections and the layout of the reservoir developed by Provost and Pritchard (February 18, 2014), three representative cross sections were developed for seepage analysis. The locations of the three cross sections are shown on Figure D2-1. Each cross section represents the geologic conditions, width of the reservoir, and the hydrogeologic regime in the various areas of the reservoir. The depth of the reservoir at each cross section was taken from the layout developed by Provost and Pritchard.

The seepage analyses consist of evaluating the flow of water into the reservoir during and at the end of excavation. The analyses are performed for the following three scenarios:

1. The first scenario considered construction of the reservoir (i.e. excavation) without a perimeter slurry wall;

2. The second scenario includes a slurry wall installed around the perimeter of the reservoir approximately 50 ft away from the crest of the slopes and extending down to elevation 388 ft above mean sea level (amsl); and

3. The third scenario consists of augmenting scenario two by adding a reinjection/recirculation trench north of the slurry wall to recirculate influent water back into the natural groundwater system.

The seepage analyses presented in this attachment were performed with the finite element programs SEEP/W (GeoStudio, 2012).

D.2.2 REPRESENTATIVE SECTIONS

D.2.2.1 SECTION 1

This section runs north to south and combines the information from geologic cross sections AA' and BB' (Attachment A in SES 2012) with an emphasis on the conditions observed at Boring B-1. Boring B-1 indicates a lack of the bedrock horizon unit that was observed at other boring locations. Consequently, groundwater flow underneath the reservoir will be within the SC/CL layer. Also, this section of the reservoir is triangular rather than trapezoidal.

D.2.2.2 SECTION 2

This section runs north to south and again combines the information from geologic cross sections AA' and BB' with emphasis on the conditions observed at Boring B-2. Boring B-2 indicates a lack of the bedrock horizon unit that was observed at other boring locations. Also, this section of the reservoir was modeled as a trapezoid.

D.2.2.3 SECTION 3

This section again runs from north to south and combines information from geologic cross sections AA' and BB' with an emphasis on the conditions observed at Borings B-3 and B-4. Borings B-3 and B-4 indicate a bedrock horizon existing at the final depth of excavation along with SC/CL and SP lenses. Also, this section of the reservoir was modeled as a trapezoid.

D.2.3 MATERIAL PROPERTIES

The hydraulic conductivities of the different stratigraphic layers were calculated using the results of the geotechnical testing carried out on samples recovered from the borings. A series of grain size analyses (ASTM D422) were performed on samples collected in the borings. The results of these tests were used together with correlations such as those developed by Hazen (1852, 1911), Kozeny (1927) and Carman (1938, 1956) to determine hydraulic conductivities. The details of the analyses are provided in Attachment B of SES (2012). The values estimated by SES were compared to those measured by Fugro (2002) at a nearby site and the values of transmissivity reported by Luhdorff and Scalmanini (1995) for a site west of the project site.

The hydraulic conductivity of the slurry wall is very low and a conductivity value was set based on engineering judgement. The selected hydraulic conductivity of the slurry wall is 3.3×10^{-11} ft/sec (1×10^{-9} cm/s).

The values of isotropic saturated hydraulic conductivities used in the analyses are presented in Table D2-1.

Analyses were performed considering isotropic as well as anisotropic conditions for the alluvium. This is the ratio of the horizontal to the vertical saturated hydraulic conductivity. Both conditions were analyzed as a sensitivity analysis to address the uncertainty in the depositional nature of the alluvium/unconsolidated materials in the upper layers. A coefficient of anisotropy of 5 was used. This coefficient was not applied to the bedrock or the slurry wall.

D.2.4 BOUNDARY CONDITIONS

The boundary conditions for the analysis were established based on the location of the reservoir with respect to the Kaweah River to the south, and the CEMEX ponds (former pits) north of the proposed reservoir.

D.2.4.1 CROSS SECTION 1

This section is the furthest from the Kaweah River at approximately 2,340 ft, and is not affected by its regime. The water table in Boring B-1 was observed at elevation 438 ft amsl. In their report, Luhdorff and Scalmanini have established that the ephemeral nature of the Saint Johns River has no significant effect on the water table in the area. Therefore, the southern boundary condition was set as a constant head of 438 ft amsl at a distance 2,340 ft south of the reservoir. For the northern boundary conditions, the groundwater elevations from Figure 6 of Kenneth Schmidt and Associates (November-December, 2011) were used. The groundwater elevation on the northern boundary was set at an elevation of 438 ft amsl 1000 feet north of the reservoir.

D.2.4.2 CROSS SECTION 2

Groundwater elevations in Borings B-5 and B-2 were used to establish the boundary in terms of total head for the north and south end of this section. The northern boundary condition was set at a constant head of 445 ft amsl at a distance 1000 ft north of the reservoir, and the boundary condition on the south was set as a constant head of 445 ft amsl at a distance 1,780 ft south of the reservoir.

D.2.4.3 CROSS SECTION 3

Section 3 is the most influenced by the Kaweah River. The groundwater elevation in Boring B-6 was used to establish the boundary conditions for the south end of this section and the groundwater elevation Figure 6 of Kenneth Schmidt and Associates was used for the north end of the section. The northern boundary condition was set as a constant head equal to 452 ft amsl at a distance 1000 ft north of the reservoir, whereas the southern boundary condition was set as a constant head of 460 ft amsl at a distance 370 ft south of the reservoir.

D.2.4.4 RADIUS OF INFLUENCE

The radius of influence for the alluvium typical of the area was established in the pump test performed by Luhdorff and Scalmanini. The radius of influence is on the order of 1,000 ft. Consequently, the model's boundary conditions were set at a minimum of 1,000 ft from the edges of the reservoir when applicable. This minimum of 1,000 ft was utilized for the southern boundaries of Sections 1 and 2. However, the southern boundary condition of Section 3 was exempt from the 1,000 ft minimum distance, as the edge of the reservoir is approximately 370 ft from the Kaweah River.

D.2.5 RECIRCULATION / REINJECTION OF INFLUENT GROUNDWATER

Scenario three utilizes an injection/recirculation trench to recirculate all influent water from the excavation back into the natural groundwater system. This injection/recirculation trench was modeled to have dimensions of 3 ft wide by 10 ft deep, and was assigned a material conductivity of $1x10^{-2}$ ft/sec (0.3 cm/sec). The injection/recirculation trench was placed 10 ft north of the slurry wall for scenario three.

As groundwater enters the excavation, it will be pumped into the injection/recirculation trench. The water added to the natural groundwater system from the injection/recirculation trench will consequently increase the flux into the excavation, thus requiring slightly greater pumping into the injection/recirculation trench to keep the excavation unsaturated. Groundwater inflow and required injection/recirculation rates will continue to rise as excavation proceeds, and must be accommodated for.

D.2.6 RESULTS

Analyses were performed for each scenario at each cross section using the representative values of saturated hydraulic conductivity listed in Table D2-1 for each formation assuming either isotropic or anisotropic conditions in the alluvium.

D.2.6.1 FLOWS AT EACH SECTION

The three sections analyzed are shown on Figures D2-2 through D2-4 for scenario one (no slurry wall), D2-5 through D2-7 for the scenario two (slurry wall), and D2-8 through D2-10 for scenario three (slurry wall and reinjection/recirculation). The results in the form of the pressure head and flux into the reservoir are shown on Figures D2-11 through D2-13 for scenario one, D2-14 through D2-16 for scenario 2, and D2-17 through D2-19 for scenario three.

The results for anisotropic conditions are similar, so are not shown herein. The results for isotropic versus anisotropic conditions indicate that the uncertainty in isotropy isn't a determining factor in the results.

The results are presented in Table D2-2 as the flow into the excavation in cubic feet per second (ft^3/s) and gallons per minute (gpm) for each representative section and each scenario analyzed.

D.2.6.2 TOTAL FLOW INTO RESERVOIR

The total flows into the reservoir were evaluated for each scenario by a weighted average of the length of reservoir perimeter best represented by each of the three sections. Those weighting lengths were established based on review of the geologic conditions, width of the reservoir, and the boundary conditions of each section. The lengths of pit modeled by each of the representative cross sections were established as:

- Section 1: 1,600 ft;
- Section 2: 2,200 ft; and
- Section 3: 2,000 ft.

For a total length of 5,800 ft.

The total flows into the reservoir for each scenario are reported in Table D2-3.

Table D2-1: Hydraulic Conductivity Values

LAYER #	SOIL DESCRIPTION	SOIL TYPE	K (cm/s)	K (ft/s)
1	Poorly Graded Sand	SP	$1.6x10^{-3}$	$5.3x10^{-5}$
2	Poorly Graded Gravel	GP	$2.3x10^{-2}$	$7.4x10^{-4}$
3	Silty Sand/Clayey Sand	SM-SMC	$5.2x10^{-5}$	$1.7x10^{-6}$
4	Sandy Clay/Low Plasticity Clay	SC/SM	$1.5x10^{-6}$	$5.0x10^{-8}$
5	Low Plasticity Clay	CL	$5.0x10^{-7}$	$1.5x10^{-8}$
6	Bedrock	–	$1.0x10^{-4}$	$3.3x10^{-6}$

Table D2-2: Flow into Reservoir at Each Representative Cross Section

Section Condition	Flux (ft3/sec/ft)	Flux (gpm/ft)
Scenario 1		
Section 1 Isotropic	9.59E-05	0.0430
Section 1 Anisotropic	9.53E-05	0.0428
Section 2 Isotropic	1.62E-04	0.0727
Section 2 Anisotropic	1.71E-04	0.0767
Section 3 Isotropic	4.40E-04	0.1975
Section 3 Anisotropic	4.70E-04	0.2109
Scenario 2		
Section 1 Isotropic	7.97E-06	0.0036
Section 1 Anisotropic	1.23E-05	0.0055
Section 2 Isotropic	2.47E-05	0.0111
Section 2 Anisotropic	4.07E-05	0.0183
Section 3 Isotropic	8.54E-05	0.0383
Section 3 Anisotropic	9.35E-05	0.0420
Scenario 3		
Section 1 Isotropic	1.210E-05	0.0054
Section 1 Anisotropic	2.430E-05	0.0109
Section 2 Isotropic	3.860E-05	0.0173
Section 2 Anisotropic	7.500E-05	0.0337
Section 3 Isotropic	1.130E-04	0.0507
Section 3 Anisotropic	1.430E-04	0.0642

Table D2-3: Total Flows into Reservoir

Condition	Flux (ft3/sec)	Flux (gpm)
Scenario 1		
Isotropic	1.390E+00	624
Anisotropic	1.469E+00	659
Scenario 2		
Isotropic	2.379E-01	107
Anisotropic	2.962E-01	133
Scenario 3		
Isotropic	3.303E-01	148
Anisotropic	4.899E-01	220

FIGURES

Figure D2-1: Layout of the Proposed Reservoir

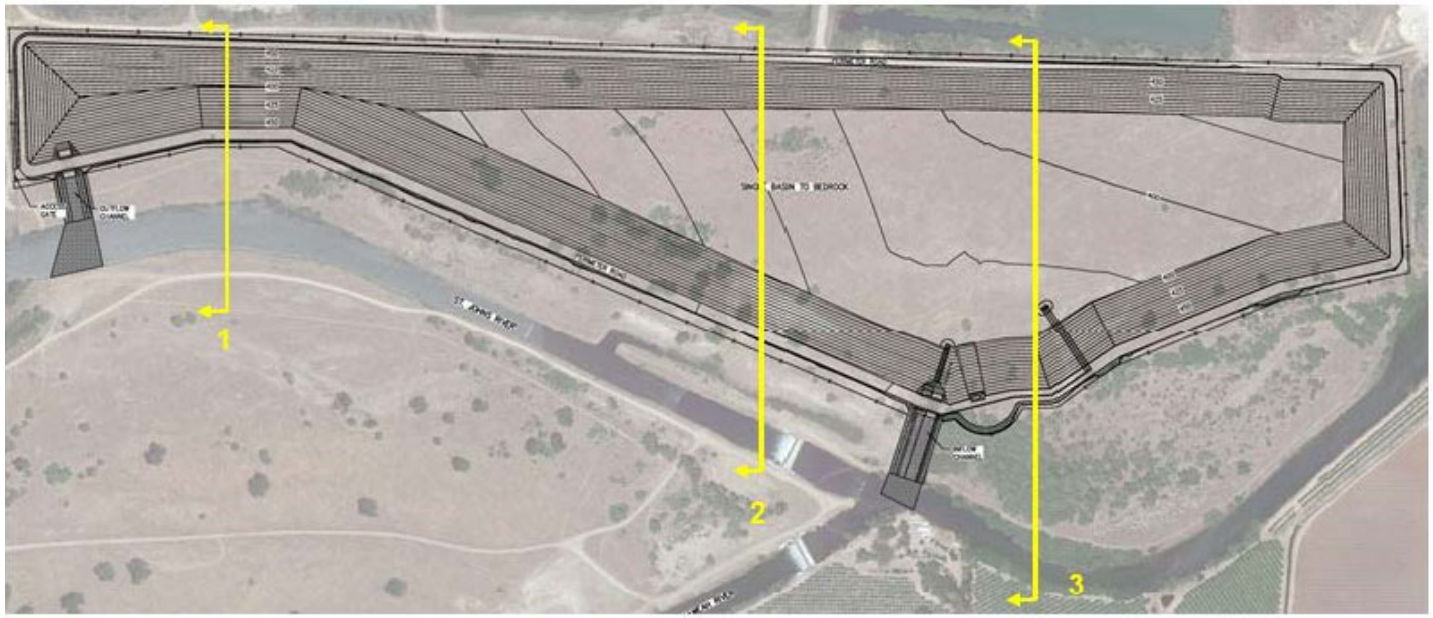
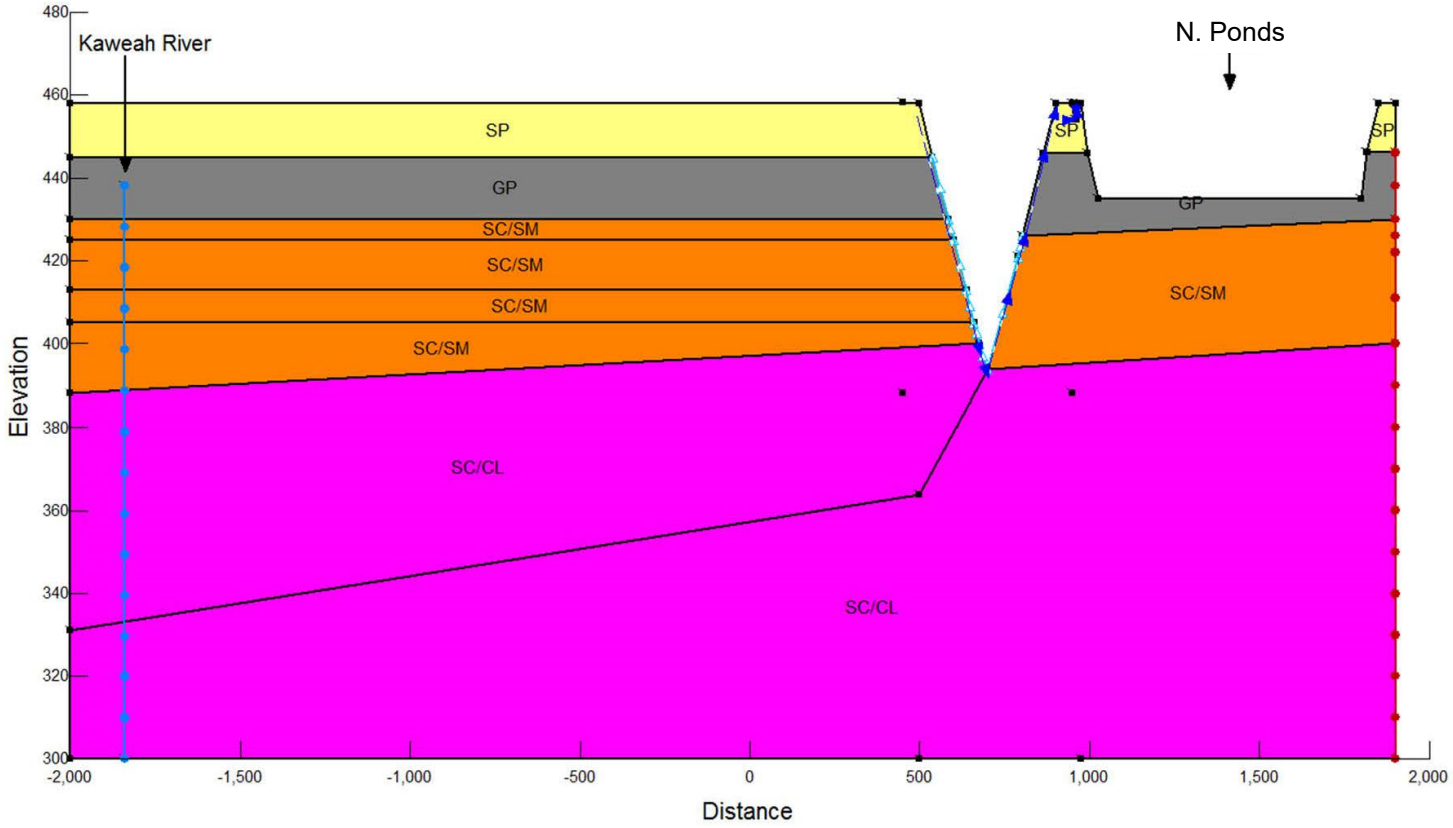
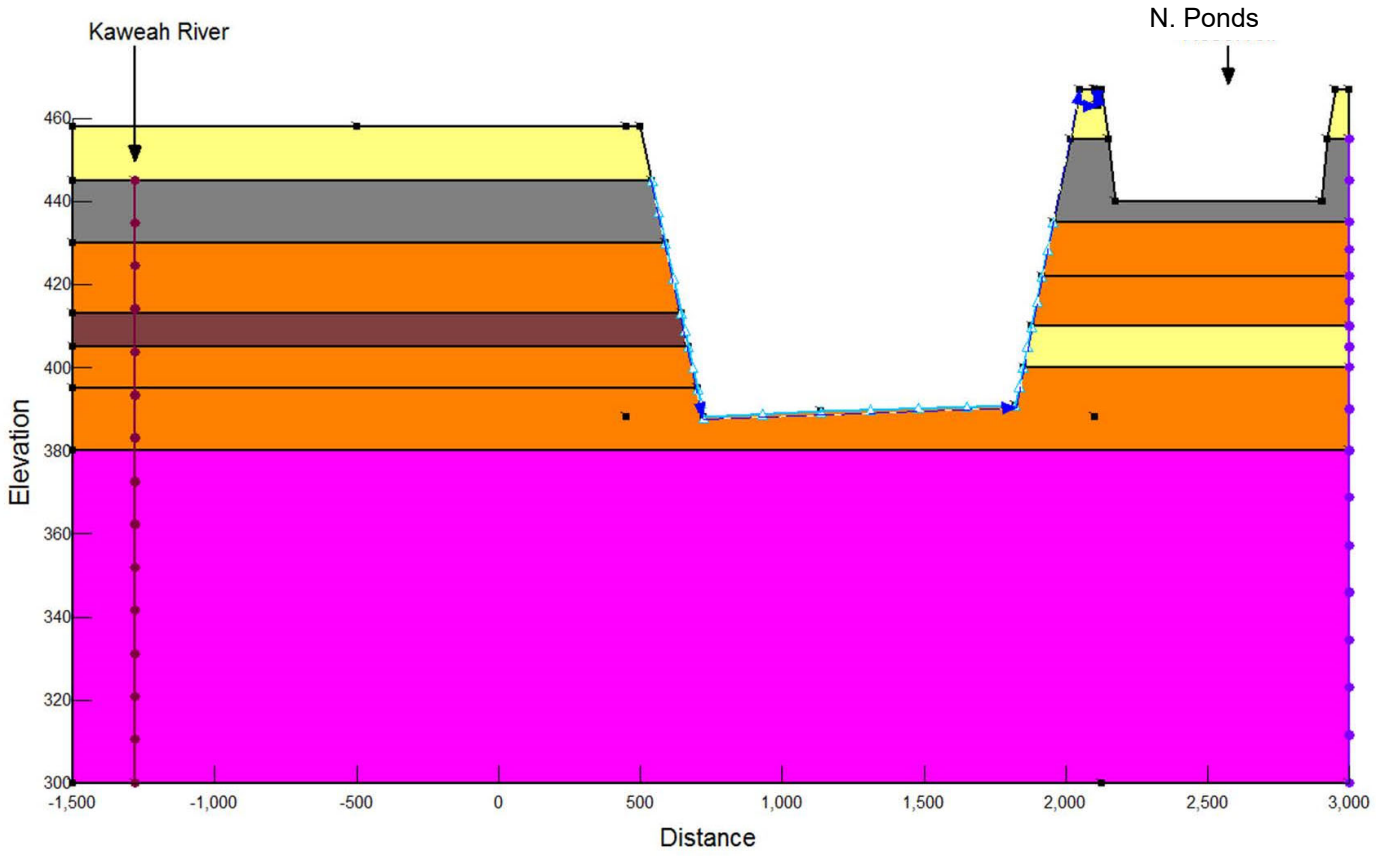


Figure D2-2: Scenario 1 (No Slurry Wall) Section 1



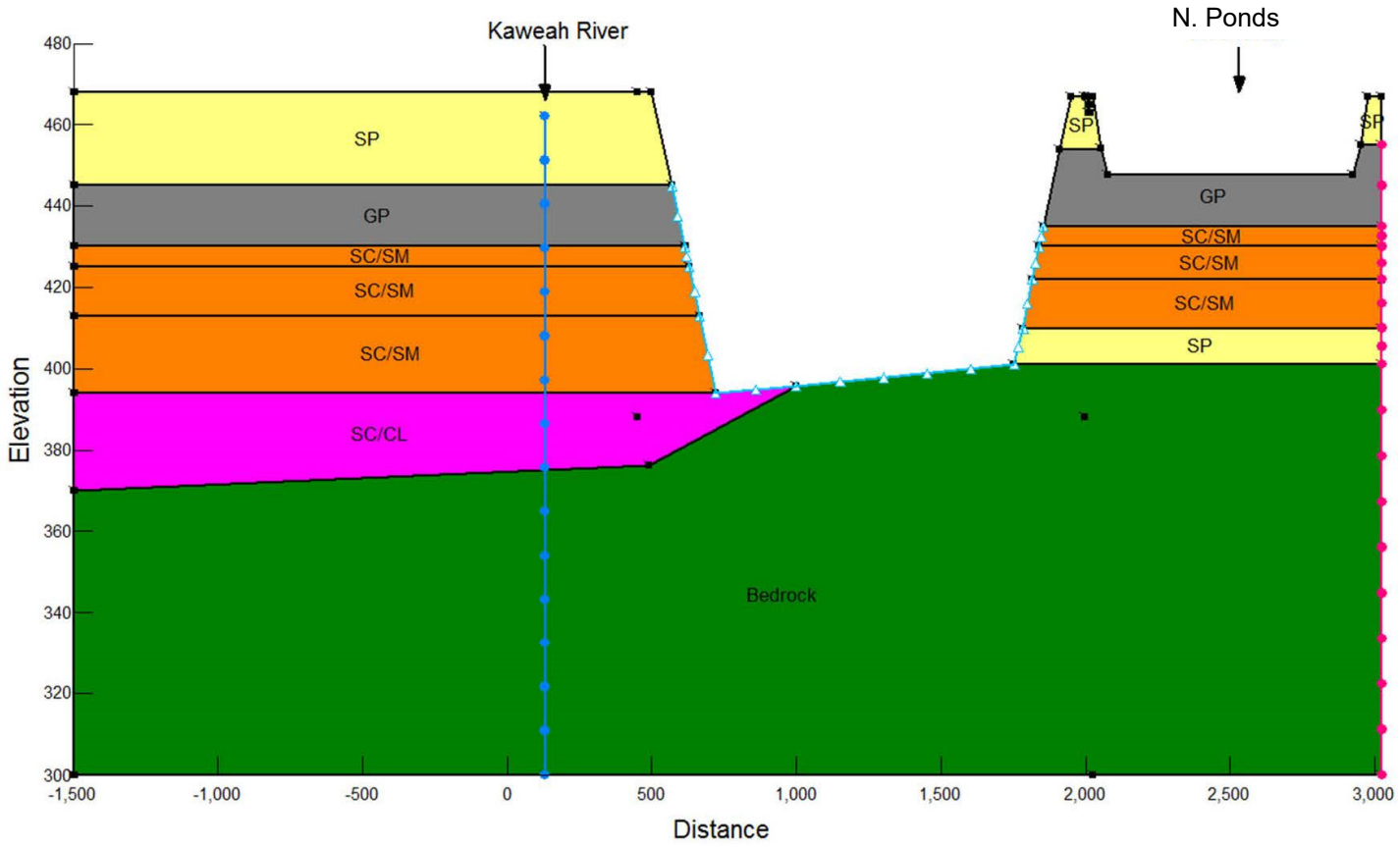
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Figure D2-3: Scenario 1 (No Slurry Wall) Section 2



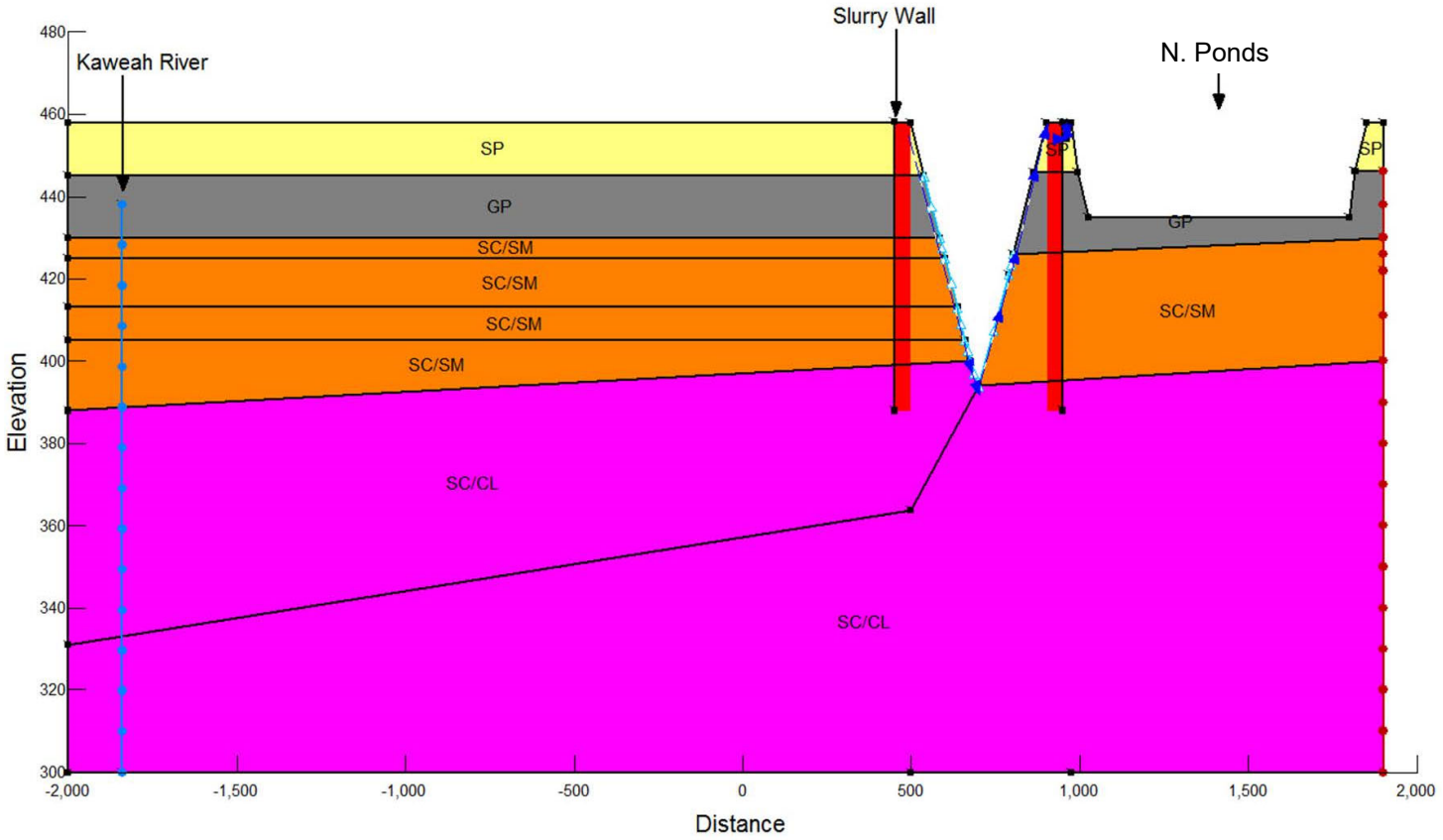
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Figure D2-4: Scenario 1 (No Slurry Wall) Section 3



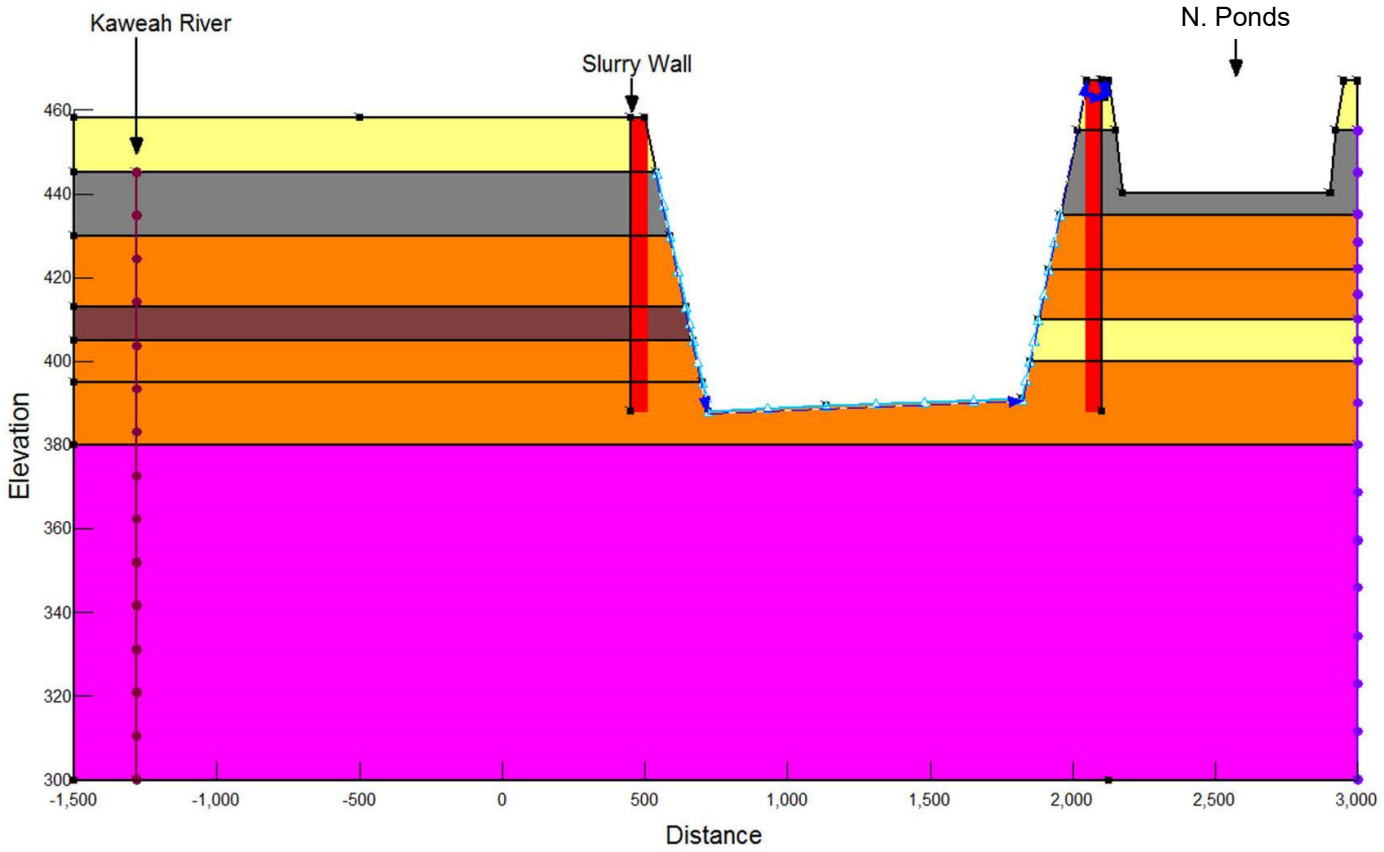
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Figure D2-5: Scenario 2 (Slurry Wall) Section 1



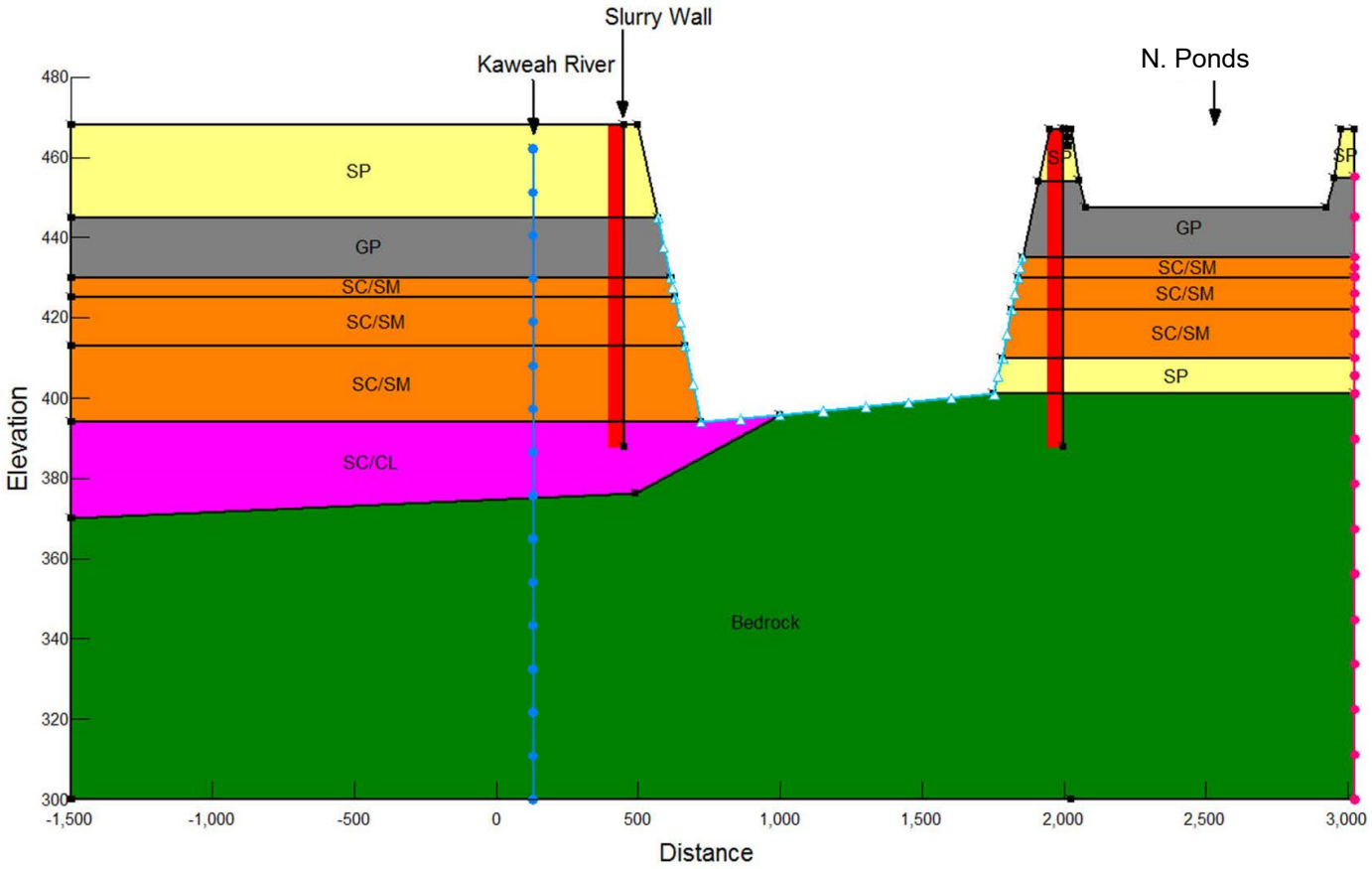
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Figure D2-6: Scenario 2 (Slurry Wall) Section 2



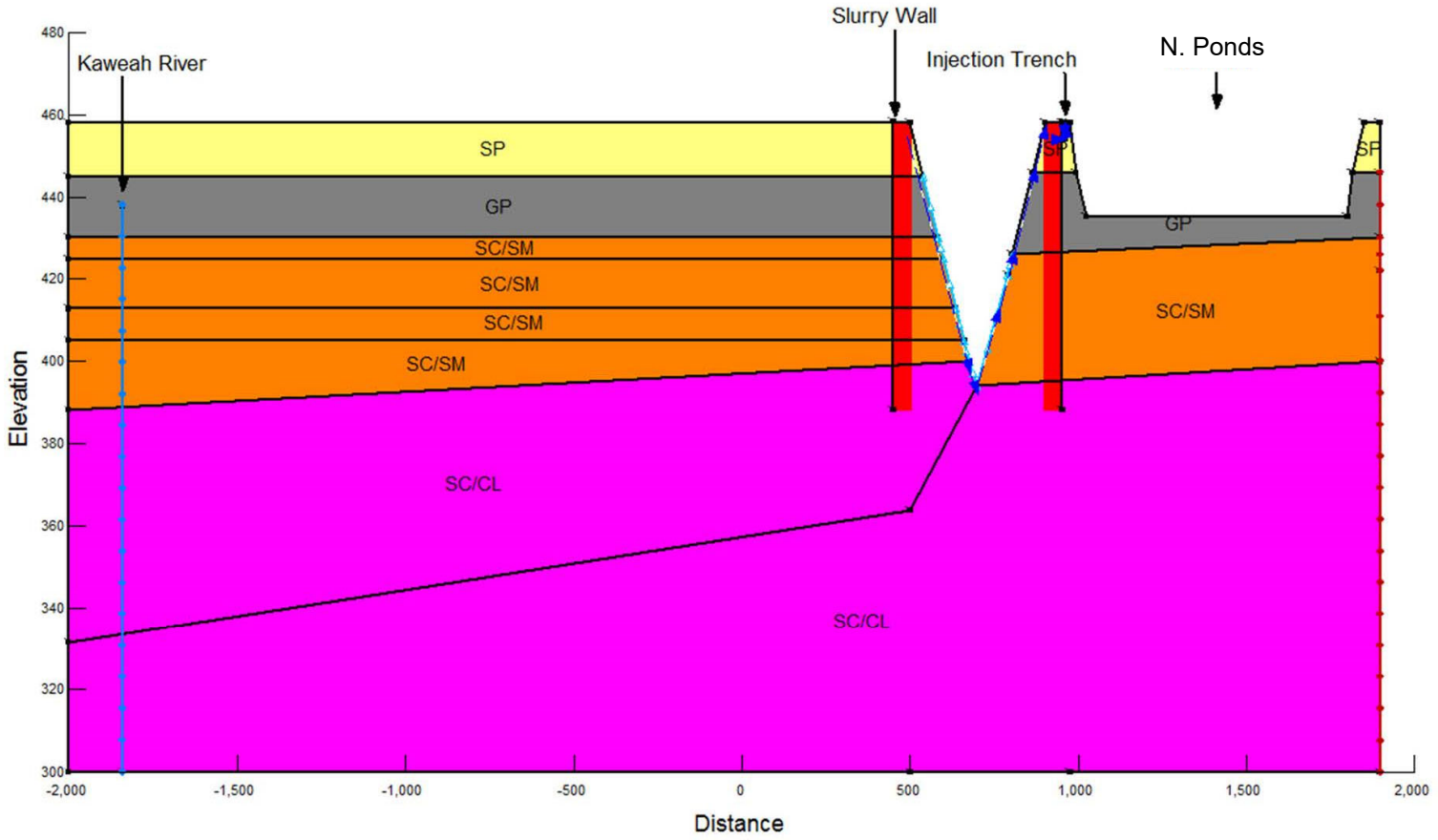
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Figure D2-7: Scenario 2 (Slurry Wall) Section 3



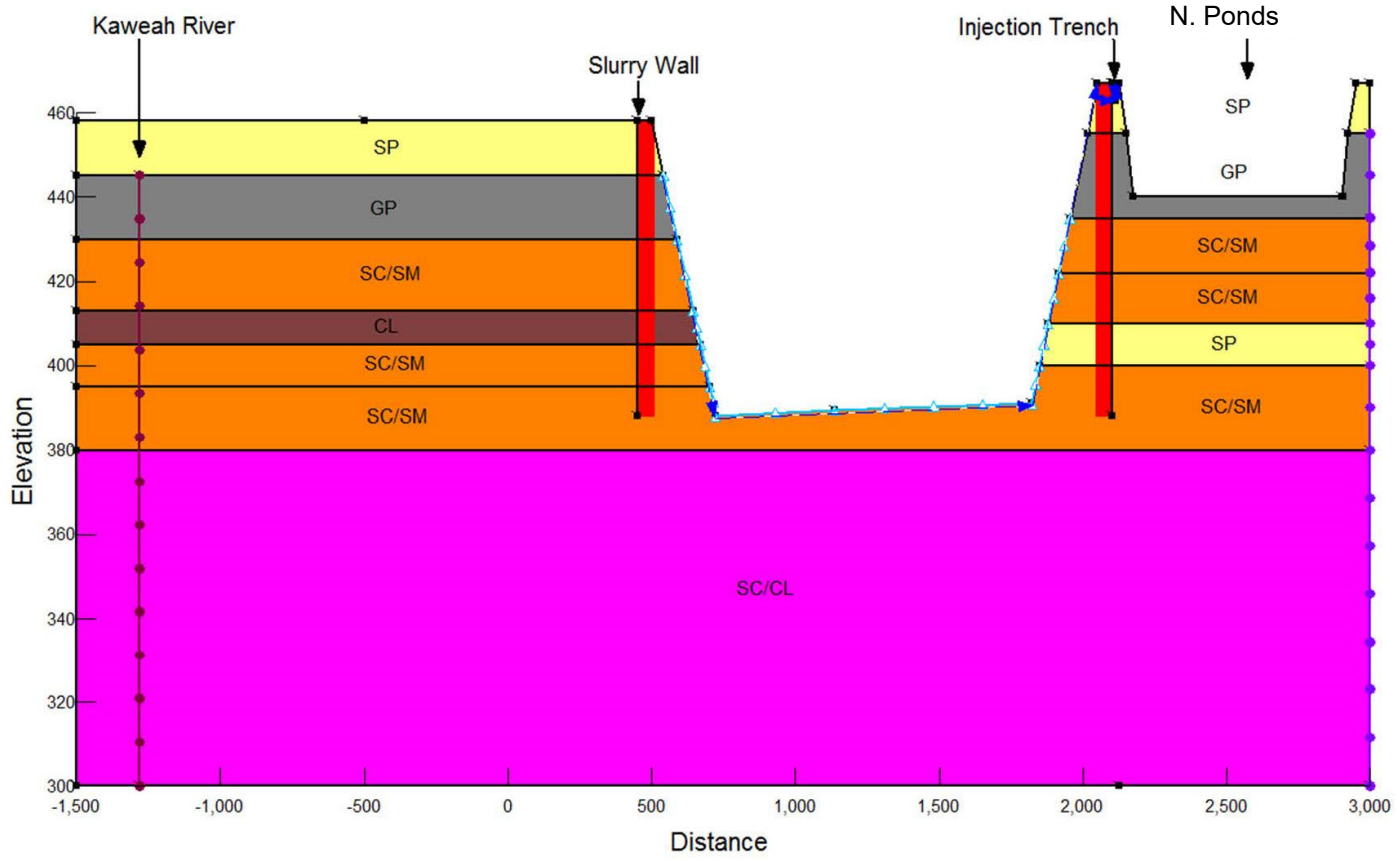
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Figure D2-8: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 1



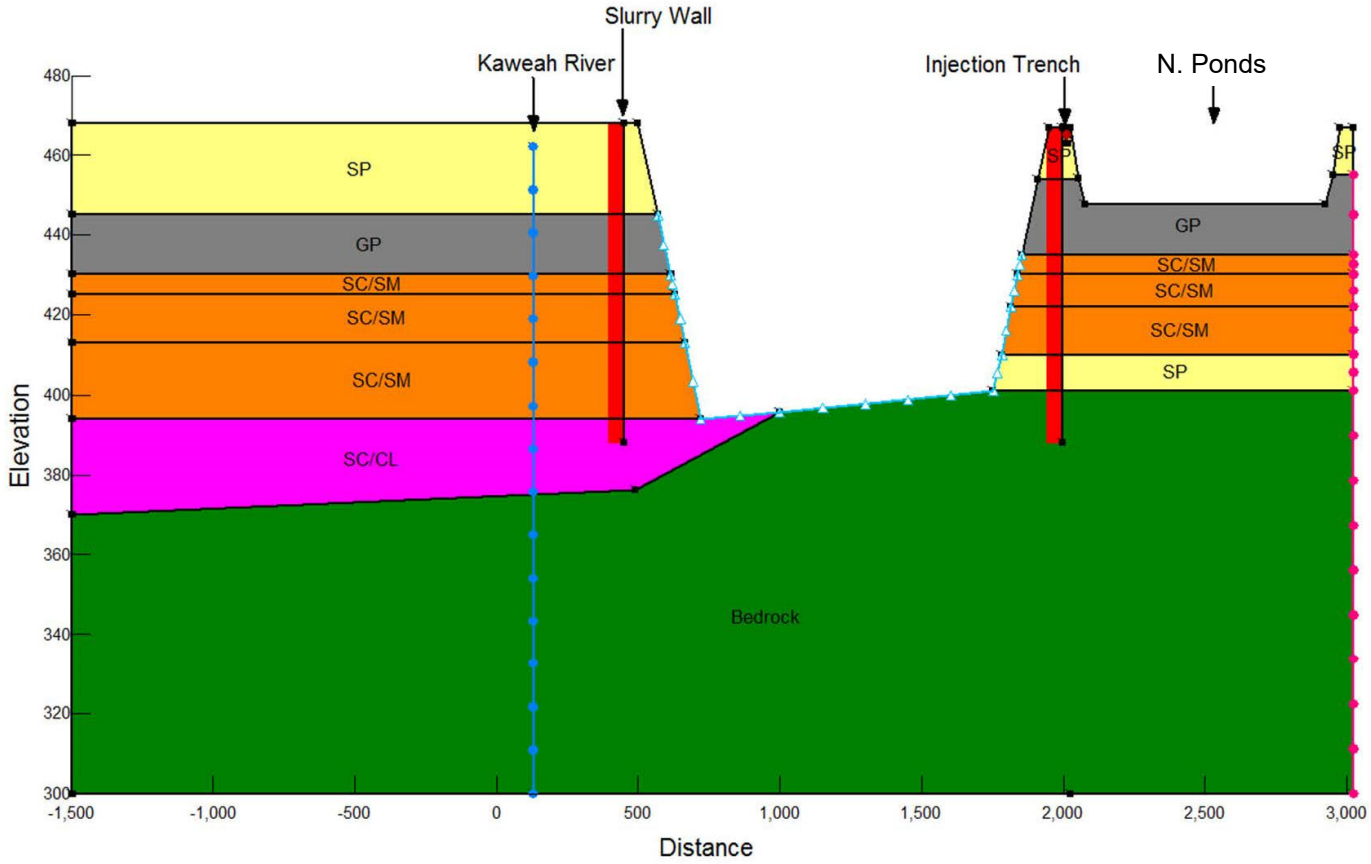
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Figure D2-9: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 2



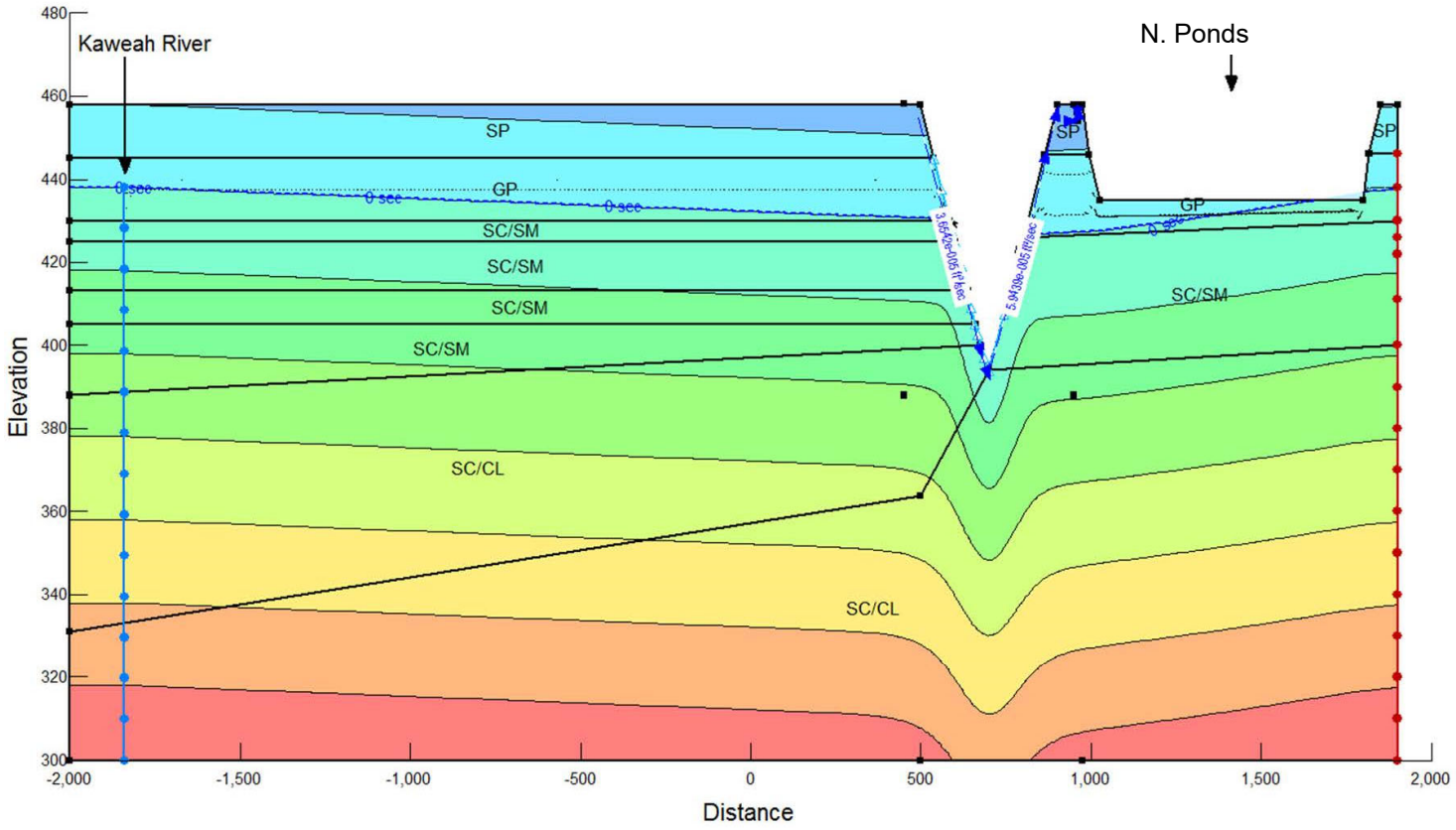
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Figure D2-10: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 3



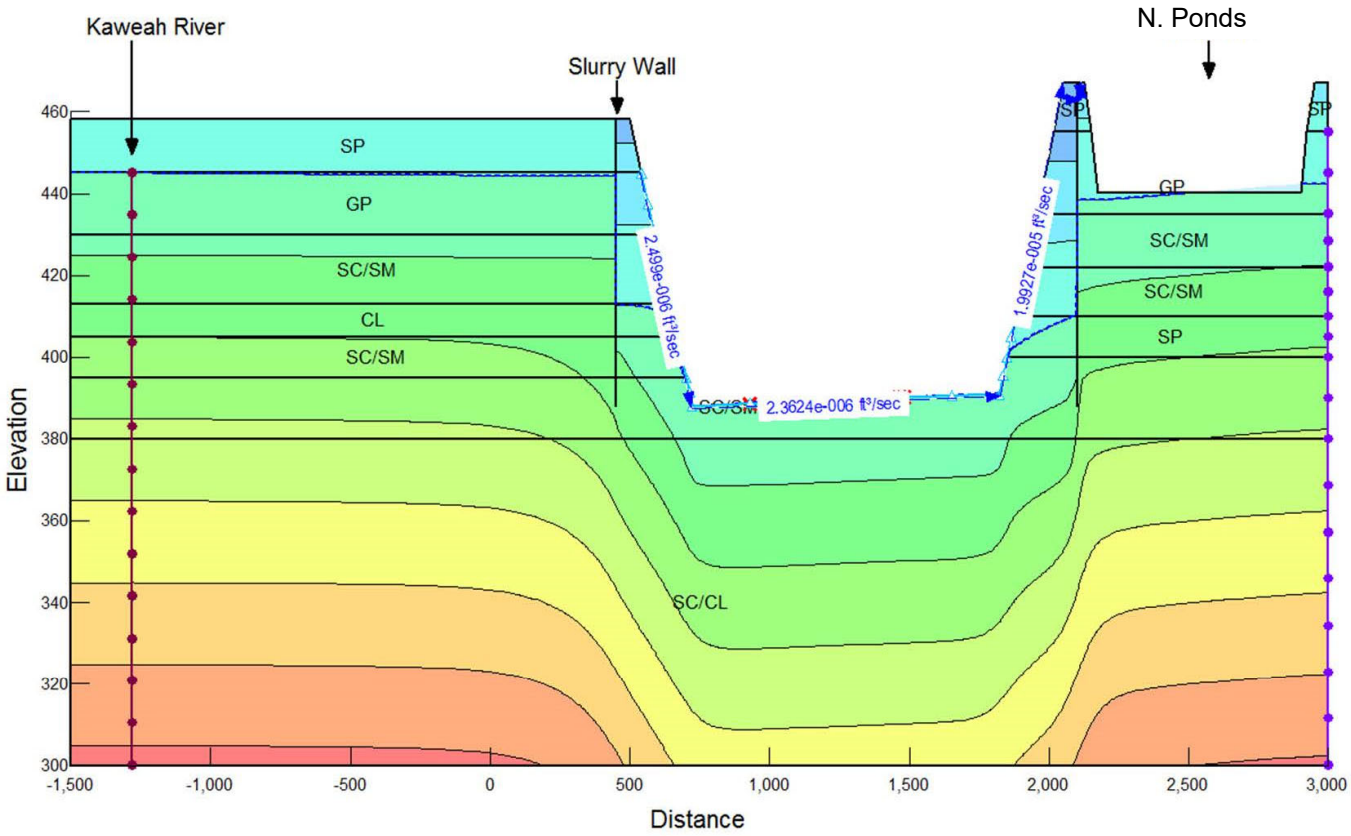
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Figure D2-11: Scenario 1 (No Slurry Wall) Section 1 Results



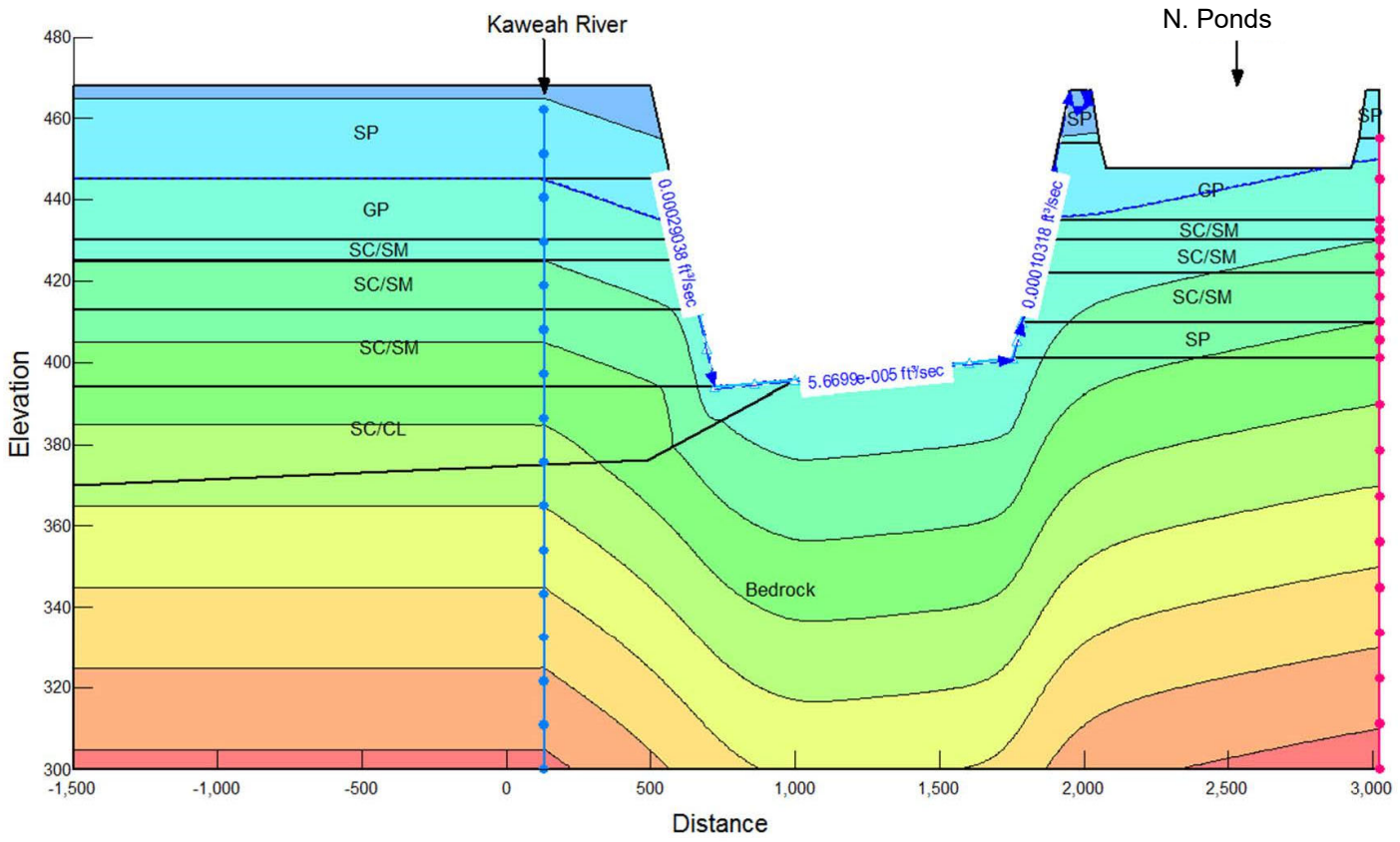
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Figure D2-12: Scenario 1 (No Slurry Wall) Section 2 Results



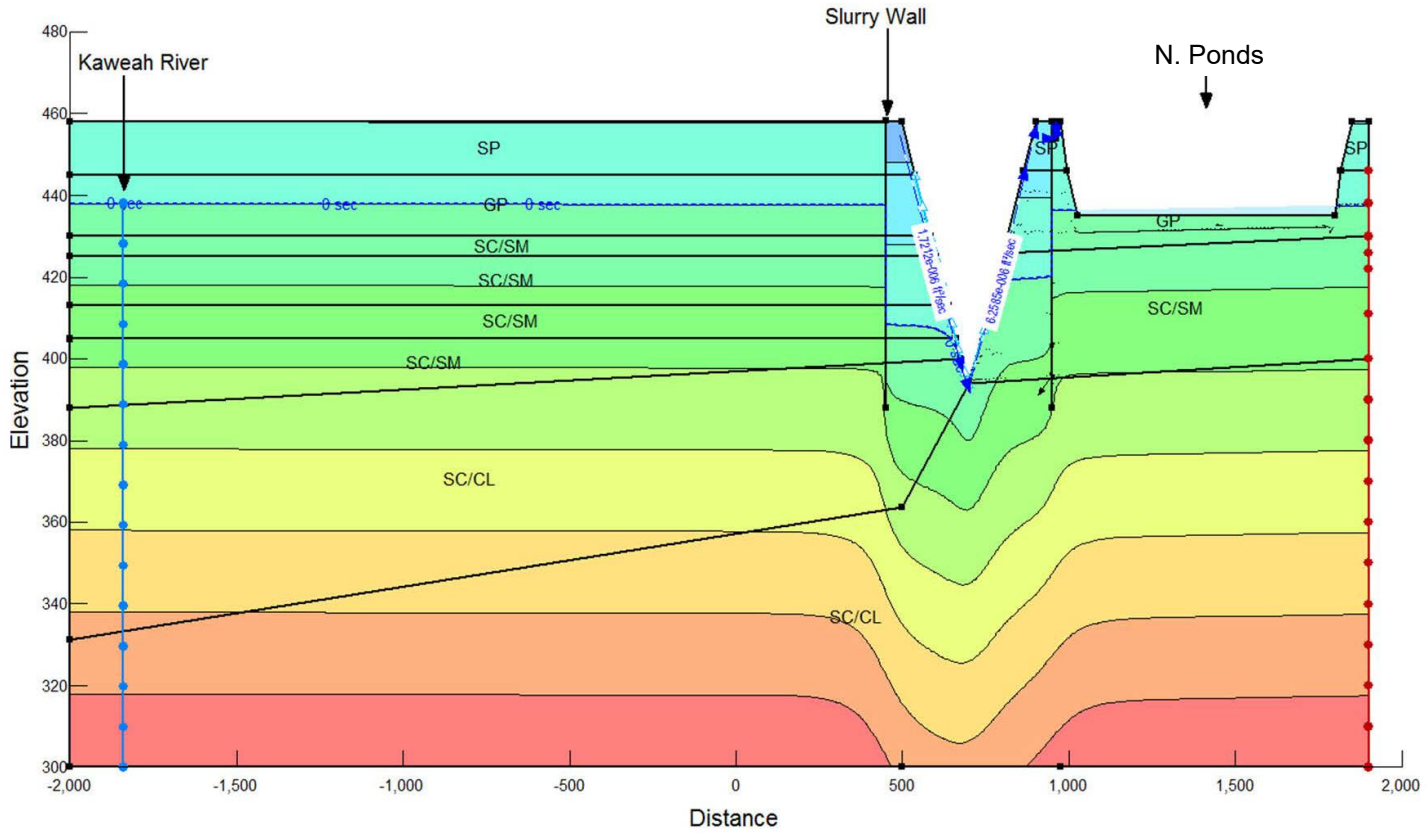
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Figure D2-13: Scenario 1 (No Slurry Wall) Section 3 Results



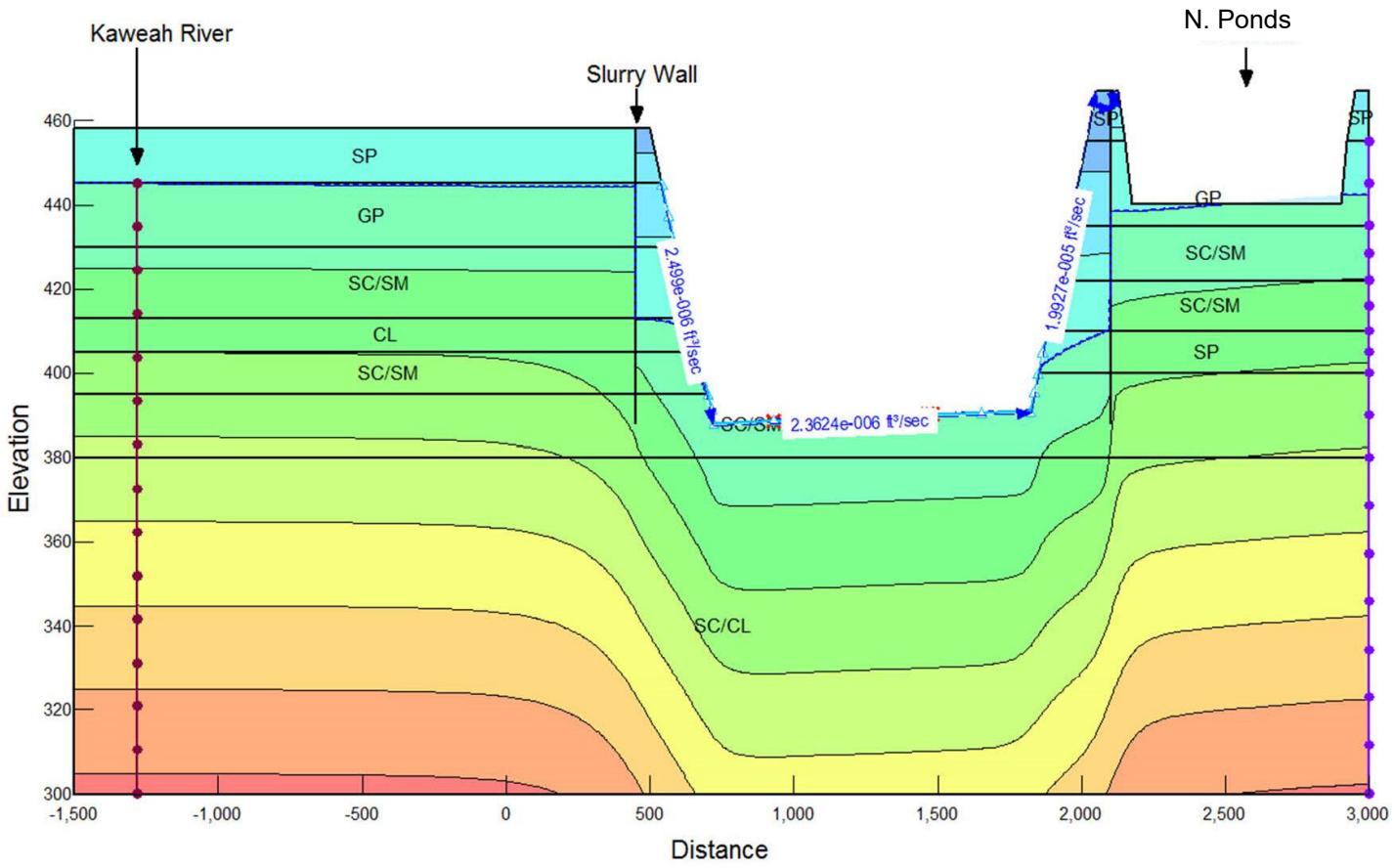
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Figure D2-14: Scenario 2 (Slurry Wall) Section 1 Results



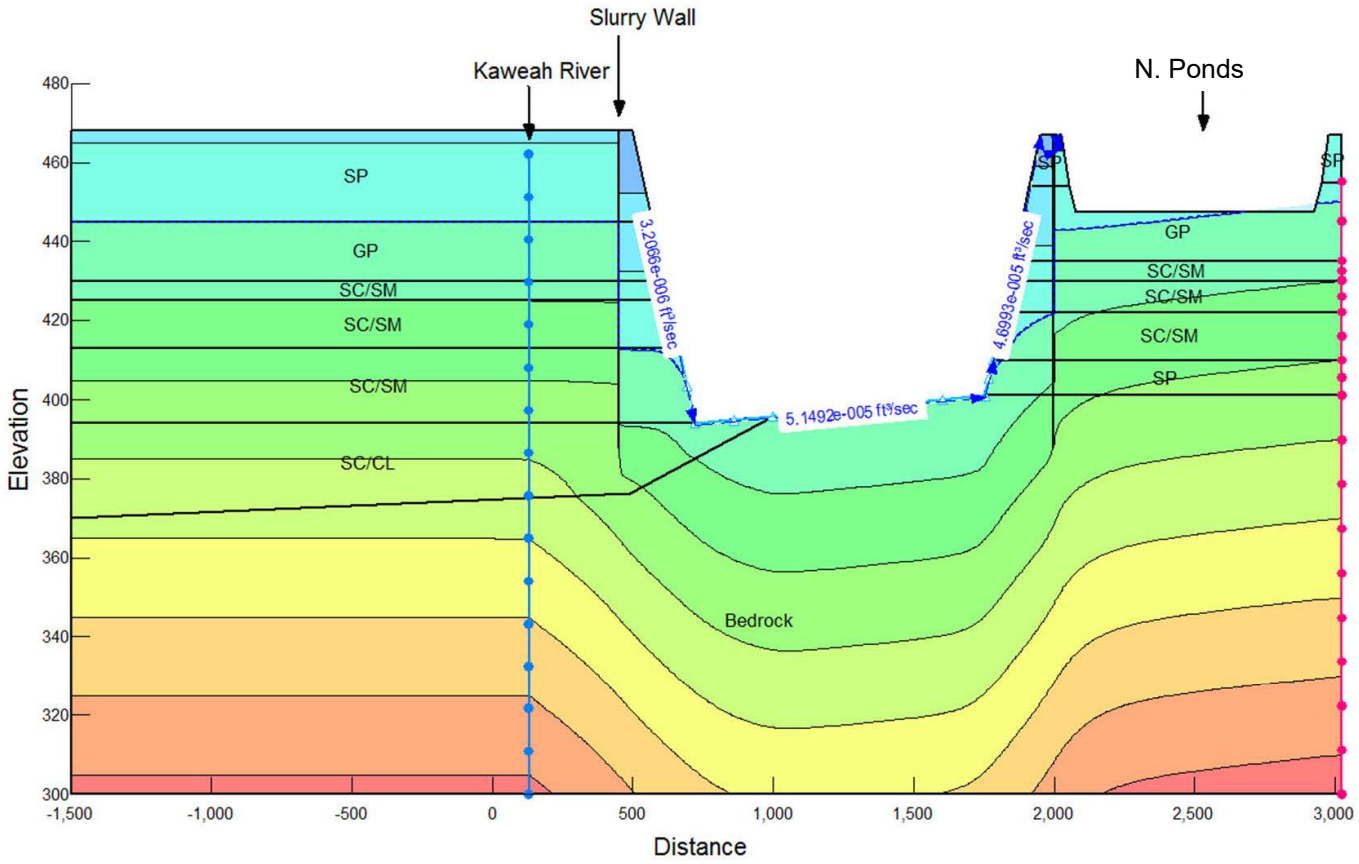
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Figure D2-15: Scenario 2 (Slurry Wall) Section 2 Results



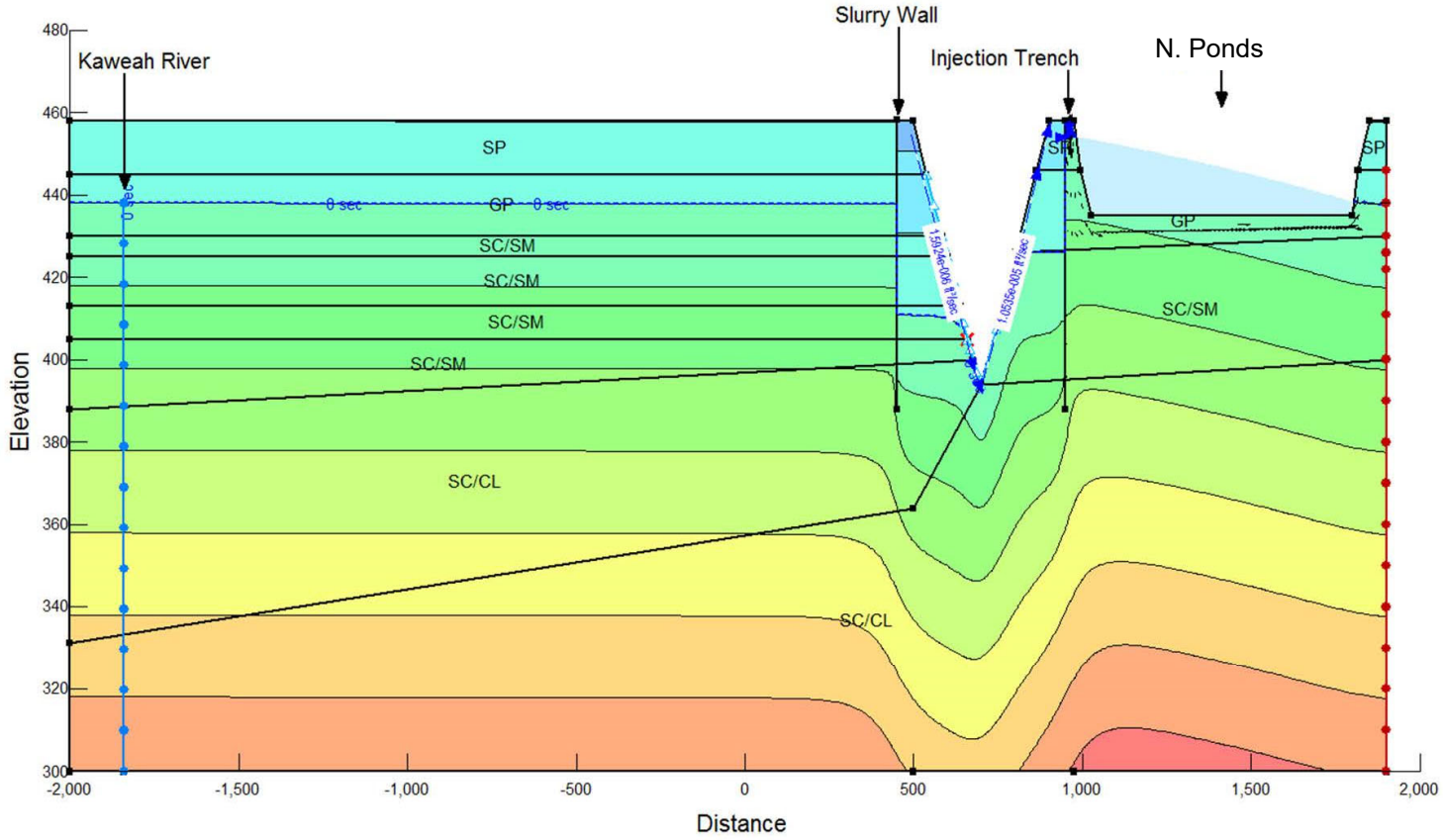
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Figure D2-16: Scenario 2 (Slurry Wall) Section 3 Results



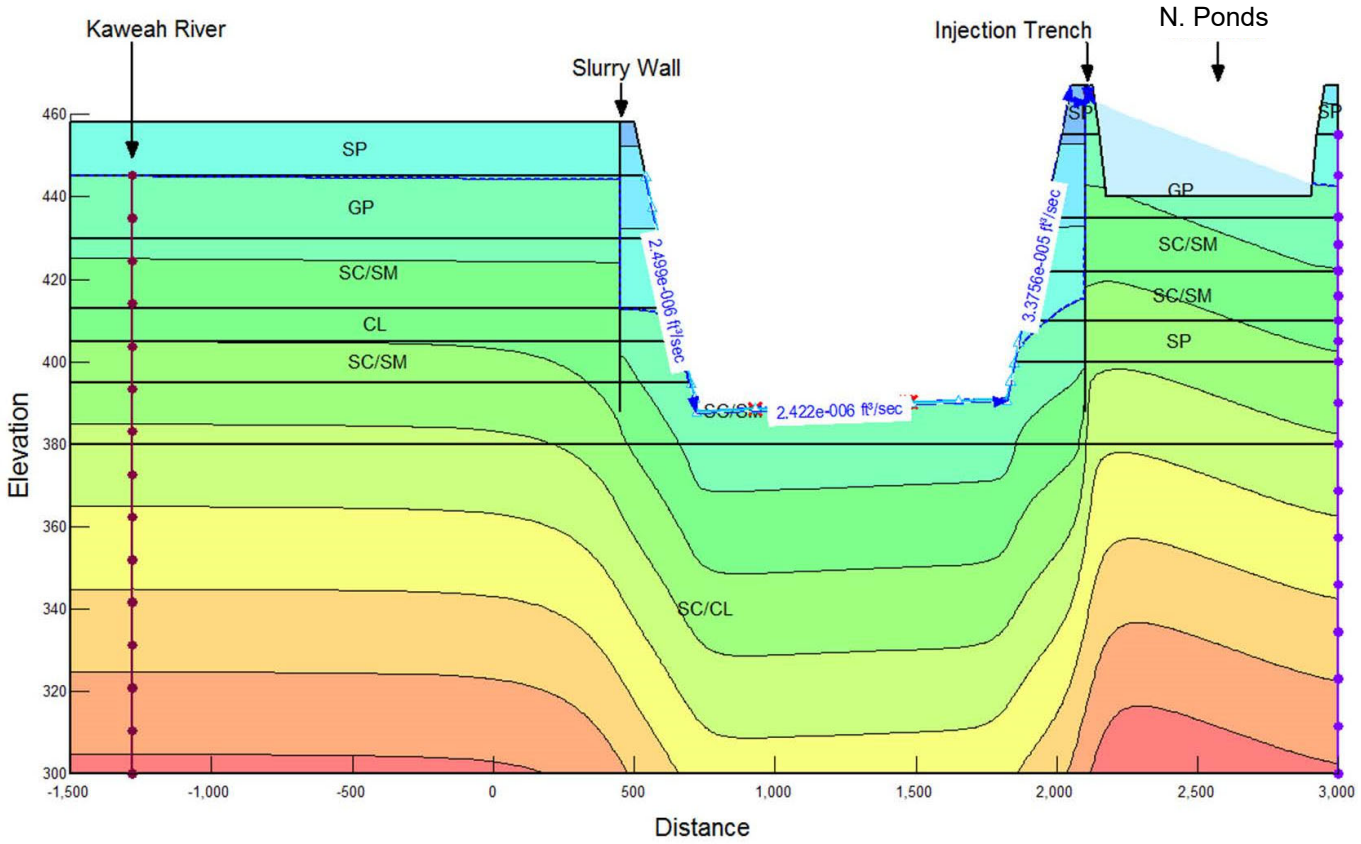
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Figure D2-17: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 1 Results



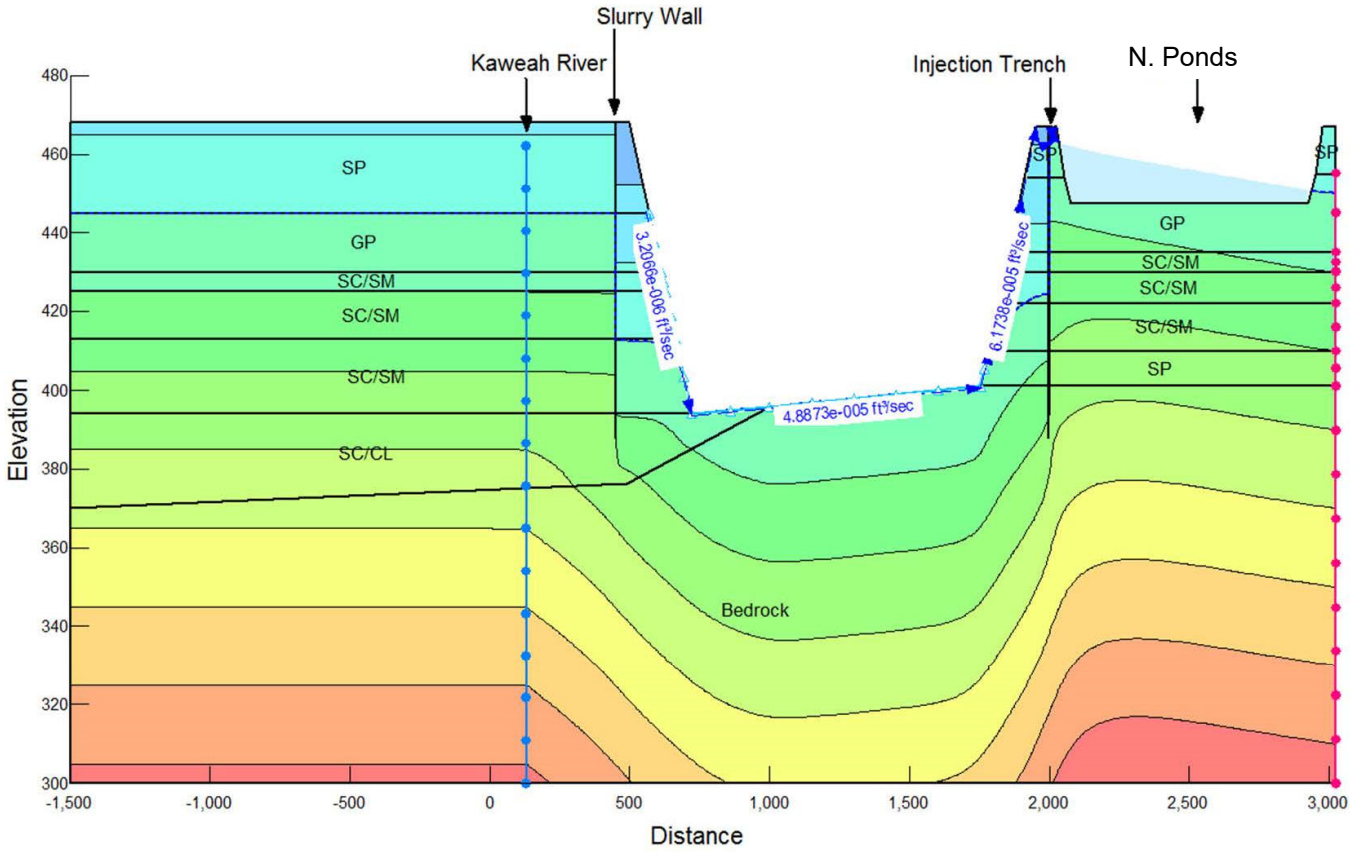
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Figure D2-18: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 2 Results



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Figure D2-19: Scenario 3 (Slurry Wall and Injection/Recirculation) Section 3 Results



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D.3 THREE DIMENSIONAL ANALYSES

D.3.1 INTRODUCTION

This attachment describes the approach and assumptions used to estimate the seepage inflow rates through numerical and empirical methods. SLR used two methodologies to assess the inflow rates.

Firstly, a systematic groundwater pump and treat (P&T) method for capture zone analysis described by the USEPA was used (USEPA, 2008). The dewatering estimate assumes the groundwater inflows to the excavation can be represented by the saturated thickness and local gradient towards the planned reservoir (Table D3-1). This approach does not include the slurry wall and infiltration trench. However, the method is helpful as a screening tool to perform a basic assessment of the hydrogeologic conditions and as a check on the flow rates expected from the numerical modeling.

Secondly, a steady-state numerical model was developed for the Project to estimate the general groundwater condition around and seepage rate into the planned excavation for the following three scenarios.

1. The first scenario considered the construction of the planned excavation to its maximum depth (i.e., reservoir) without a perimeter slurry wall;

2. The second scenario includes slurry walls installed around the perimeter of the planned maximum excavation; and

3. The third scenario consists of augmenting scenario two by adding a reinjection/recirculation trench north of the slurry wall to recirculate the collected influent water back into the natural groundwater system.

D.3.2 BACKGROUND

The numerical assessment evaluates the anticipated changes to the baseline hydrogeologic conditions resulting from the Project. The source of lithological and hydrogeological data of the evaluation are previous studies conducted on the site, such as Kenneth D. Schmidt and Associates 2012, SLR 2021a, SLR 2021b, and Section D.2 above. Additional data from other publicly available documents were also reviewed and used as part of this assessment.

D.3.3 EXCAVATION DESIGN, SLURRY WALL, AND INFILTRATION TRENCH SETTING

The excavation design has about 5,700 ft length and variable-width ranges from 330 to 1,310 ft Figure 3D-2 and Figure 3D-11 (Provost & Pritchard Consulting Group via email, June 2021). The excavation depth ranges from 370 – 425 ft amsl from the ground surface (about 467 ft, amsl), generally overlying the clay unit and bedrock.

The slurry wall is designed to impede the inflow of water to the planned excavation from all dimensions. A thickness of one foot and hydraulic conductivity equal to that of the clay unit (0.0013 ft/day, or $5x10^{-7}$ cm/sec) was used in the model.

The infiltration trench was set to the north of the slurry wall, and the hydraulic conductivity was equal to that of the gravel (69 ft/da, or 2.5 x 10^{-2} cm/sec).

The existing ponds are represented by surface water that intercepts groundwater flow towards the reservoir. The ponds are treated in the model overlying a highly permeable material extending 10 feet below the local potentiometric surface. The impact of the ponds on the dewatering rate from the excavation was evaluated compared to the results of scenario 2.

D.3.4 METHODOLOGY

The conceptual site model (CSM) provides a framework for understanding site-specific features and physical processes that influence groundwater flow around the planned excavation. The conceptual site model (CSM) aims to organize the field data to simplify the field problem while maintaining its essential characteristics so that the system can be analyzed more readily. Of necessity simplification of site conditions is required when establishing a CSM (Anderson and Woessner, 1992).

A total of seventeen boring logs, six onsite (BSK, 2011), and eleven offsite, boring logs were used to build the CSM (Figure D3-1). The offsite boring logs were collected from the California Department of Water Resources (CA-DWR) website. The lithologic logs were reviewed for their quality, and poorly logged borings were excluded from further consideration. Based on these borings, the thickness of alluvial deposits at the Project site ranges between approximately 60 and 80 feet. The uppermost alluvial deposits at the Project site consist of sand, cobbles, boulders, silt, and clay (Luhdorff and Scalmanini, 1995). The contact between alluvial deposits and bedrock is shallower in the east and gets deeper towards the west (Kenneth D. Schmidt and Associates, 2012).

The CSM formulation involves synthesizing available hydrological, lithological, hydrogeological data contained in various reports. It includes consideration of the

hydrogeologic framework, water budget, and groundwater flow systems. Historical water levels indicate that the groundwater flows from the northeast towards the southwest **(**SLR, 2021b).

Hydrostratigraphic units of the CSM were developed using related strata that control the groundwater flow. There are six major geologic/hydrogeologic units generated from Leapfrog Works (Seequent Limited, 2020, version 4.0.1), consistent with the previous classifications presented in Figure D-2 (also Kenneth D. Schmidt and Associates, 2012; SLR, 2021a). These hydrostratigraphic units were exported from Leapfrog Works and imported into the Groundwater Vistas model grid.

D.3.5 EPA METHOD OF SEEPAGE RATE ESTIMATE

The groundwater inflow rate into the planned excavation was estimated using the following mathematical relationship (USEPA, 2008):

$$Q = K * (b * w) * i * factor$$

Where

Q = extraction rate (cubic feet per day)
K = hydraulic conductivity (ft/day)
b = saturated thickness (ft)
w = excavation width/length in this case (ft)
i = site-wide/regional hydraulic gradient
factor = 1.5 to 2.0, accounting for other contributions to the water in the reservoir, for example, horizontal flow from northeast, vertical flow from another water-bearing zone or ponds, etc.

SLR reviewed site-specific data such as:

- Range of hydraulic conductivities from seepage studies (Section D.2).
- Water levels (SLR, 2021b, CA-WDR's website)
- Site hydraulic gradient (SLR, 2021b, CA-WDR's website)
- Excavation design (surface area, width, depth, side slopes, etc. (SLR, 2021b, Provost & Pritchard Consulting Group via email, June 2021).

Using this information, SLR developed key inputs in Table D3-1, with detailed calculations and results presented in Table D3-3.

Table D3-1 – Key Inputs to the EPA Method of Dewatering Estimates

Excavation Design	
Excavation average depth (ft)	60
Unsaturated thickness around the planned excavation, b (ft)	20 - 25
Saturated thickness around the planned excavation, b (ft)	37 - 52
Length/Width/ of the planned excavation, b (ft)	5,709
Hydraulic properties, gravel (ft/day)	69
Hydraulic gradient (ft/ft) [Average of gradients]	0.012

Note:- The minimum and maximum of the saturated and unsaturated thicknesses are based on borings B1-B6 and all monitoring wells listed in Table D3-4, respectively.

Assumptions inherent to the method include:

- Homogenous, isotropic, confined aquifer of infinite extent;
- Uniform aquifer thickness;
- The saturated zone around the planned excavation represents the aquifer thickness;
- Uniform regional horizontal hydraulic gradient;
- Steady-state flow;
- Negligible vertical gradient;
- No net recharge or net recharge is accounted for in regional hydraulic gradient; and
- No other sources of water were introduced to the aquifer induced by excavation.

D.3.6 NUMERICAL MODEL SEEPAGE RATE ESTIMATE

The CSM is converted into a mathematical model by selecting a code, specifying boundary conditions, grids to represent the geologic formations, employing aquifer parameters, recharge, and discharge zones of the Site. Details of the model development are given below.

D.3.6.1 CODE SELECTION

The numerical model was constructed and calibrated in MODFLOW-USG, a new version of MODFLOW (McDonald and Harbaugh, 1988; Harbaugh, 2005) for unstructured grids (Panday et al., 2013). The modeling environment and pre-/post-processor is Groundwater Vistas version 8.03 (ESI, 2020).

The model cells can take on numerous shapes, such as triangles, octagons, and variable sizes, allowing refinement in areas of interest, i.e., the planned excavation. Unstructured grids do not necessarily require to be arranged on a row, and column bases and cells are linked together regardless of shape. The planned excavation was represented in the domain by “air” zones where high K values (assumed to be 5,000 ft/day) were assigned to let unrestricted water flow into it (Table D3-6). Groundwater Vistas was employed for a pre - and post-processing of input and output data, respectively. It also provides an extensive set of tools for developing, modifying, and calibrating numerical models.

D.3.6.2 MODEL DEVELOPMENT AND INPUT DATA

The three-dimensional geologic model domain was built in Leapfrog Works and exported to the Groundwater Vistas. Historical hydrogeological data were reviewed and processed to represent average conditions (Table D3-4). The model was developed to simulate the steady-state groundwater condition based on the average data of historical water levels. About fifteen monitoring wells, inside and outside the property, were used for calibration. Ten monitoring wells were used as target heads, and the remaining five wells were used to establish General Head Boundary conditions (Table D3-4).

D.3.6.3 MODEL GRID AND BOUNDARY CONDITIONS

No-flow boundaries were assigned to parts of the southern and northern edges of the domain to simulate the general northeast to southwest groundwater flow gradient. These boundaries were set at a sufficient distance from the planned excavation to allow the model to calculate the impact of dewatering the reservoir on groundwater levels surrounding it. General head conditions that allow groundwater flow into and out of the system were set on the northeast and southwest. Water level heads for the General Head Boundaries were set based on the average historical water levels collected from adjacent monitoring wells (Table D3-4). General head conductances were set high enough to permit flow into and out of the system depending on the surrounding heads. A river boundary was specified to imitate the Kaweah River to the south (Figure D3-5).

The model grid consists of 6 layers, 356 columns and 127 rows, with grid spacing ranging from 21 ft to 200 ft and 21 ft to 282 feet for columns and rows, respectively (Figure 3D-1). Finer grid spacing was applied around the planned excavation. The model domain has an active area of 77.7 million sq. ft.

D.3.6.4 AQUIFER PROPERTIES AND RECHARGE

For the steady-state model, the principal aquifer properties are hydraulic conductivities and recharge. The hydraulic conductivities of the major geologic units were determined

by geotechnical testing through grain size analyses (ASTM D422) and Section D.2. Hydraulic conductivity values set for the calibrated model are restricted to be between 95 % to 105 % of the values based on the above geotechnical testing and are presented in Table D3-6.

Recharge flux to the system was estimated from the average precipitation collected from the site vicinity, namely LEMON COVE (LMC). The annual precipitation data summarizes measurements collected from June 2019 to June 2021. The recharge flux applied to the calibrated model is roughly 10 % infiltration of the recharge estimated from LMC (Table D3-2).

Table D3-2. Calibrated Model Recharge

Precipitation Averages (Inches)	
January	2.73
February	2.52
March	2.08
April	1.45
May	0.49
June	0.15
July	0.01
August	0.03
September	0.2
October	0.71
November	1.4
December	2.26
Yearly Precipitation (in)	*14.03*
Recharge flux (ft/day) 20%	*0.000641*
Recharge flux (ft/day) 10%	*0.000320*
Recharge flux (ft/day) in the calibrated model	***0.000285***

D.3.7 MODEL CALIBRATION

Calibration of a numerical groundwater flow model is the process of adjusting model parameters to obtain a reasonable match between field-measured values and model predicted values of heads (groundwater levels) and fluxes (groundwater flows). There are two ways of finding model parameters to achieve calibration (Anderson and Woessner, 2002). (1) Manual trial and error adjustment of parameters and (2) automated parameter estimation. Groundwater Vistas (GV) assists model calibration in three ways (ESI, 2020):

(1) calculation of calibration statistics for a head, drawdown, or flux, (2) automated parameter sensitivity analysis, and (3) automatic model calibration using a nonlinear least-squares technique built into the GV interface or using external inverse models such as PEST (Doherty, 2010). All these methods have been applied to calibrate the steady-state model.

D.3.8 RESULTS

D.3.8.1 RESULTS OF EPA METHOD

The six boring logs and the resulting three-dimensional geologic model demonstrate that gravel and sand dominate the subsurface beneath the planned excavation. The inflow rate was estimated to be 750 (gpm). The estimate was based on calculations with limited site data, and the actual seepage rates may vary. Results are summarized below in Table D3-3.

Table D3-3. Estimation of Extraction Rates

					[1]Scenario 1 - Factor = 1.5		***[2] Scenario 2 - Factor = 2.0***	
Excavation Inflow Estimates	**K[1] (ft/day)**	**b[2] (ft)**	**W[3] (ft)**	**i[4] (ft/ft)**	**Q[5] (ft3/day)**	**Q[5] (gpm)**	**Q[6] (ft3/day)**	**Q[6] (gpm)**
Inflow Rate (Q)	6.9E+01	51.91	5,709	0.0035	108,418	564	144,383	750

Note
1 Scenario 1 represents inflows to the ponds that are coming from the north only.
2 Scenario 2 assumes a small component of inflows from the northeast.
3 The methodology and assumptions are provided in USEPA's "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems", EPA 600/R-08/003, January 2008.

D.3.8.2 RESULTS OF STEADY-STATE NUMERICAL MODEL

3.8.2.1 Calibration Results

The calibration process confirmed that hydraulic conductivities and recharge previously applied for SEEP/W simulation (Section D.2) are still valid. The final calibrated parameters are also within 95 % to 105 % of the previously determined or used to understand the hydrogeologic condition of the Project Site. Locations of targets are provided in Figure D-1. A summary of the calibration steady-state water level targets is provided in Table D3-4.

Table D3-4 Calibrated Water Level Comparison

No.	Target	Easting (UTM, m)	Northing (UTM, m)	Layer	Water Level, Observed (ft, amsl)	Water Level, Modelled (ft, amsl)	Remark
1	B-1	315652	4029539	2	438	441	Target well
2	B-2	316076	4029512	2	443	445	Target well
3	B-3	316551	4029302	2	447	451	Target well
4	B-4	316743	4029518	2	452	453	Target well
5	B-5	316300	4029264	2	446	447	Target well
6	B-6	317022	4029113	2	459	459	Target well
7	363918N11 90734W001	314045	4029402	2	429	430	Target well
8	363880N11 90651W001	314781	4028965	2	433	430	Target well
9	364010N11 90362W001	317404	4030352	2	460	457	Target well
10	MW2	314315	4029330	2	431	430	Target well
11	363827N11 90542W001	315746	4028356		439.9		GHB well
12	364060N11 90645W001	314877	4030961		461.1		GHB well
13	MW1	314615	4028497		426		GHB well, estimated head
14	MW3	313037	4029045		428		GHB well
15	MW4	313184	4028212		420		GHB well

Note: 1) North America NAD83 UTM zone 11 N (meters)

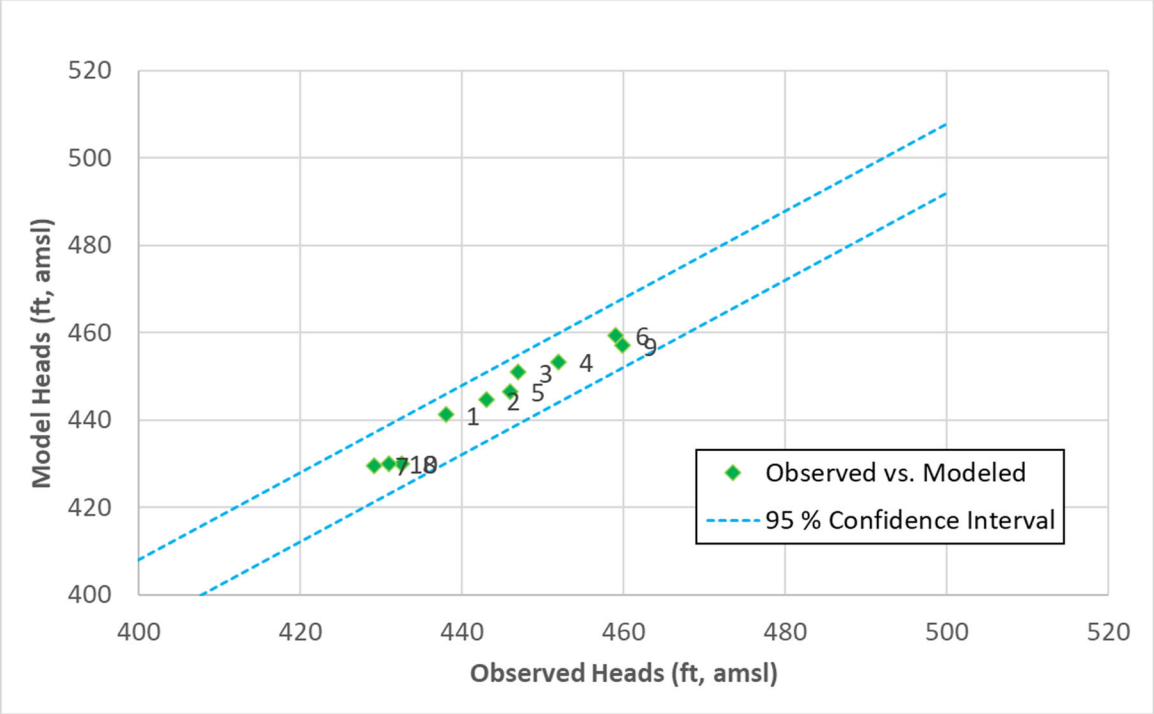
3.8.2.2 Calibration Statistics

Table D3-5 presents a summary of the statistical measures for the steady-state calibration. A Scaled root mean square (SRMS) of less than 10% is desirable and less than 5% preferable. The model's SRMS is about 7.0% (Table D3-5).

Table D3-5 Calibration Statistics

Residual Mean (ft)	-0.47501
Absolute Residual Mean (ft)	1.769329
Residual Std. Deviation (ft)	2.098374
Sum of Squares (ft^2)	46.288088
RMS Error (ft)	2.151467
Min. Residual (ft)	-3.914231
Max. Residual (ft)	2.855395
Number of Observations	10
Range in Observations (ft)	30.7
Scaled Residual Std. Deviation	0.068351
Scaled Absolute Residual Mean	0.057633
Scaled RMS Error	0.07008
Scaled Residual Mean	-0.015473

Chart 3-1 Observed vs. Simulated Groundwater Levels (Steady-State)



3.8.2.3 Calibrated Hydraulic Conductivities

A summary of the final calibrated parameters used for the simulation of the above-mentioned three scenarios is provided in Table D3-6.

Table D3-6 Calibrated Conductivity and Storage Parameters

Parameter	Kx (ft/day)	Ky (ft/day)	Kz (ft/day)
Bedrock	0.3091331	0.3091331	0.00293969
Clay	0.001235	0.001235	0.0013
Silty/Sandy Clay	0.004515	0.004515	0.000371081
Silty/clayey sand	0.139555	0.139555	0.06556124
Gravel	69.3	69.3	6.6
Sand	4.75	4.75	0.5
Air	5000	5000	5000

Table D3-7 Calibrated Recharge Parameters

Parameter	Description	Rate ft/day	% Annual Rainfall
R1	Site-wide	0.000285	10.0%

D.3.8.3 WATER BALANCE

The water balance for the calibrated model is provided in Table D3-8. General Head Boundary comprises most of the total inflows and outflows.

The model is considered to have a good mass balance; flow rates entering and leaving the system are 303 gpm (58,167 ft^3/day) and 302 gpm (58,158 ft^3/day), respectively. The corresponding percent discrepancy is low, 0.02%.

Table D3-8 Summary of Water Balance (steady-state, non-project condition)

	In (ft^3/d)	Out (ft^3/d)
Constant Head	0	0
River	24,634	8,367
General Head	31,477	49,791
Recharge	2,057	0
Total	**58,167**	**58,158**
Discrepancy (In-Out)	8.8 ft3/d	0.02 %

The calibrated model's parameter distribution led to the best overall simulation of the hydrogeologic conditions predicted after the planned excavation placement under the three scenarios mentioned above (Figure 3D-3). Results of the predictive simulations are provided below.

D.3.8.4 RESULTS OF PREDICTIVE MODEL SIMULATION

The results of the predictive models for the three scenarios mentioned above are explained in detail in the following sections.

3.8.4.1 Results of the Frist Scenario- Excavation without Slurry Walls

As the excavation draws more water, the potentiometric surface around the excavation declines progressively to the bottom of the reservoir that ranges from 390 ft amsl to 424 ft amsl. When the resulting potentiometric levels are compared to the natural condition, the drawdown inside the excavation ranges from 43 ft amsl to 65 ft amsl. The shallower water level follows silty/sandy clay or bedrock within the planned reservoir, as the excavation halts at the clay or bedrock units (Figure D3-4).

Figures D3-3 through D3-5 demonstrate the natural condition, project-condition and comparison of the natural (existing) water level with the predicted water level after excavation.

The drain cells, set at 390 ft amsl within the reservoir, quantify the amount of water that needs to be dewatered. The steady-state model estimates the total inflows into the reservoir to be approximately 830 gpm (Table D3-9).

3.8.4.2 Results of the Second Scenario- Excavation with Slurry Walls

The placement of the slurry walls changes the inflow rate into the excavation significantly. When the slurry walls extend to the bottom of layer 2 (~ 378 ft amsl), the barrier diminishes the inflow into the excavation to 70 gpm a reduction of approximately 90% from the previous scenario (Figure D3-6).

To simulate the case where the slurry wall depth is less extensive, the second layer was divided into two and the slurry was set to layer one and half of layer two. It is then assumed, that the slurry wall is installed to a shallower depth, i.e., only through the upper half of layer 2. The inflow increased by two folds compared to the results of scenario two (i.e., from 70 gpm to 160 gpm).

The following figures compare the water level changes caused by excavation with the slurry walls (Figures D3-6 and D3-7).

The model results indicate limited groundwater depression compared to the natural condition. The placement of the reservoir still draws groundwater flow towards it despite the placement of slurry walls. The depression is proportional to the lower inflow rate (160 gpm) and occurs dominantly in layer two. The average depth to the water table in layer one is about 50 % of the thickness of the layer (~22 ft), and thus, a limited decline in the groundwater level. Layer two is fully saturated and experiences an increased decline in groundwater level due to a proportionally higher flow to the reservoir. Overall, the groundwater depression is significantly less when compared to scenario 1. The increased decline in Layer 2 indicates that the pre-excavation upward gradient is reduced. The excavation intercepts the groundwater flow; however, below the bottom of the reservoir, it remains significantly unchanged and is governed by a regional gradient.

3.8.4.3 Results of the Third Scenario- Excavation with Slurry Walls and Infiltration Trench

When scenario two is augmented by the infiltration trench, the estimated inflows into the planned excavation do not change significantly from the estimated rate of scenario two. A limited groundwater mounding is observed in layer one due to about 70 gpm of flux infiltrated through a trench (Figure D3-6 through D3-8). In layer two, like scenario two, depression of groundwater is observed due to the inflow to the excavation.

The results indicate that the slurry wall controls the flow around the excavation (Table D3-9) dominantly.

Table D3-9 Model Mass Balance

Condition	Flux (gpm)	Remarks
Planned Excavation in Layers 1 and 2 [No Slurry Wall]	**Scenario - 1**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl
	830	
Planned Excavation surrounded by a Slurry wall in Layers 1 and 2 [Scenario 2 with a Slurry wall extended to layer 1 and part of layer 2]	**Scenario - 2**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl. [Bottom elevation of sublayer 2-1 is ~ 400 ft amsl.]
	70	
	160	
Planned Excavation surrounded by a Slurry wall with Infiltration Trench on the North [Scenario 3 with a Slurry wall extended to layer 1 and part of layer 2]	**Scenario - 3**	Drain cells were set @ 390 ft, amsl, top elevation of L1 ~ 467 ft, amsl, bottom elevation of L2 ~ 380 ft. amsl [Bottom elevation of sublayer 2-1 is ~ 400 ft amsl.]
	74	
	174	

To further characterize inflow for the slurry wall scenario, a different completion depth as assumed. The slurry wall was set to layer one and half of layer two by dividing layer two into two sublayers. The results indicate this would increase the inflows slightly to 160 and 174 gpm respectively (Table D3-93, Figure D-9).

SLR notes that the results of the numerical simulations are based on simplifications of the actual field condition. The actual dewatering rates are expected to be around the approximated inflow rate but may be higher or lower by some amount.

D.3.9 SENSITIVITY ANALYSIS

Sensitivity analyses were conducted to understand how changing some conditions affects the inflow rates to the excavation. The changes made to evaluate the sensitivity of the model are the following.

1. Existing ponds to the North of the Reservoir, which vary in size in the Google Earth historical images, were set as high permeability subsurface material that intercepts groundwater. The “air” zone (5000 ft/day) was assumed up to 10 ft depth below the water level as measured by nearby monitoring wells. Its impact is evaluated by the resulting inflow rate towards the reservoir.
2. In addition, to assess the robustness of the slurry wall in minimizing inflows to the excavation, a simulation was performed assuming a worst-case failure of a segment of the wall, and inflow rates were estimated and compared with the results of scenario two.

D.3.9.1 SENSITIVITY ANALYSES

The following changes were made to analyze the sensitivity of the model to changes in the input parameters.

Existing Ponds to the north of the Reservoir. The pond’s water was treated as surface water intercepting groundwater through artificially high hydraulic conductivity (“air” zone (5000 ft/day)). The subsurface beneath the pond is assumed to be 10 ft below the local water level and is restricted to layer one (Table D3-10). The results indicate the inflows (65 gpm) would be like those with groundwater levels in the area. The slight decrease is due to the slightly differing heads assume in groundwater and the ponds respectively.

Slurry Wall failure. The failure mode analysis assumed that the slurry wall for scenario two was also assumed to fail using two different sizes. Failure of four columns in layers one and two (84 ft by the saturated thickness of layer one and 84 ft by 45 ft in layer two) resulted in an inflow increase by more than two-fold to 190 gpm (Table D3-10). The failure in the wall will occur over an area of 42 feet by 45 feet (i.e., two columns and layer one and half of layer two), the resultant inflows remain the same as scenario 2 (Table D3-10).

Table D3-10 Model Sensitivity Analyses

CONDITION	FLUX (GPM)	REMARKS
Ponds to the North of the Reservoir (Slurry walls set in Layer 1 and Layer 2)	65	The ponds intercept some groundwater flowing towards the reservoir
Slurry walls set in Layer 1 and Layer 2 assumed to fail in bigger section (26 ft by 45 ft)	Scenario - 2 (modified)	
	190	
Slurry walls set in Layer 1 and Layer 2 assumed to fail in smaller section (13 ft by 22.5 ft)	Scenario - 2 (modified)	The small crack does not change the results of Scenario 2.
	70	

3.9.1.1 Model Uncertainties

It is important to understand numerical models have their limitations and the results should be considered approximate at these stage two methods have essentially be applied, i.e. Both 2-D and 3-D analyses to increase the level of confidence in the results. For purposes of these analyses, it is anticipated that during the detailed design process, added field data will be made available and the modeling will be improved.

The calibrated steady-state flow model simulations reasonably match water levels and the groundwater inflow rate estimate through different methods is not significantly different.

Some of the limitations of the modeling work are as follows:

- Site specific lithological, well construction, water level data was limited, and additional data from other publicly available documents were also reviewed and used as presented without further validation.

- The steady-state model represents the general hydrogeologic conditions, and variation of input parameters, water levels and water budget with time is not considered in the numerical simulations.

D.3.10 CONCLUSIONS

The results of the model calibration for the steady-state model reasonably matched water levels and the groundwater flow budget measured or estimated for the site. The total inflows projected using the USEPA (USEPA, 2008) empirical method is not significantly different from the seepage rate estimated numerically. The total flow rates into the reservoir are assessed for each scenario and are reported in Table D3-8.

The results of the numerical simulations are based on simplifications of the actual field condition. The actual dewatering rates are expected to be around the approximated inflow rates but may be higher or lower by some amount.

D.4 REFERENCES

Anderson, M.P, and Woessner, W. W., 1992, Applied Groundwater Modeling, Simulation of Flow and Advective Transport, Academic Press, Inc.

ASTM D422-63(2007), Standard Test Method for Particle-Size Analysis of Soils, ASTM International, West Conshohocken, PA, 2007, www.astm.org

BSK, 2011, Geotechnical Engineering Report, Proposed McKay Point Reservoir Project, Summary of Field Exploration and Boring Logs, Tulare Irrigation District, Tulare, California, December 19.

Carman, P.C. (1938). "The determination of the specific surface of powders", J. Soc. Chem. Ind. Trans., 57, 225.

Carman, P.C. (1956). Flow of gases through porous media, Butterworths Scientific Publications, London.

Doherty, J 2010b. PEST Model Independent Parameter Estimation User Manual: 5th Edition. Watermark Numeric. Document can be found via the following website address: http://www.pesthomepage.org/Downloads.php

ESI (Environmental Simulations), Inc. 2020. Guide to Using Groundwater Vistas, Version 6. pp 213. Prepared by Environmental Simulations, Inc., Reinholds, VA.

Fugro West (2002). "Preliminary Geotechnical and Hydrogeologic Study at the Approximate 378-Acre Property known as Hannah Ranch, Tulare County, California", August.

Harbaugh, A.W. (2005) MODFLOW-2005, the U.S. Geological Survey Modular Ground-Water Model—The Ground-Water Flow Process. U.S. Geological Survey Techniques and Methods 6-A16.

Hazen A. (1892). "Some physical properties of sands and gravels with special reference to their use in filtration", 24th Annual Report Massachusetts State Board of Health, Pub. Doc. No. 34, pgs 593-556.

Hazen A. (1911). "Discussion of 'Dams on sand foundation' by A.C. Koenig", Trans. Am. Soc. Civ. Eng., 73, pgs 199-203.

Kenneth D. Schmidt and Associates, 2012 Groundwater Conditions at and in the Vicinity of the Tulare Irrigation District Mackay's Point Project

Kozeny, J. (1927). "Ueber kapillare Leitung des Wassers im Boden", Wien, Akad, Wiss., Ajad, Wiss., 136(2a), pg 271.

Luhdorff and Scalmanini (1995). “Impact Analysis Proposed Kaweah River Rock Company Mining Operations, North Hannah Ranch, Woodlake, California”, Report, August.

McDonald, M. and Harbaugh, A.W. (1988) A Modular Three-Dimensional Finite Difference Ground-Water Flow Model. In: Techniques of Water-Resources Investigations, Book 6, U.S. Geological Survey, 588.

Seep/W (2012). Seepage Modeling with SEEP/W 2012 An Engineering Methodology GEO-SLOPE International Ltd.”

Seequent Limited, 2020, Leapfrog Works version 4.0.1 3D geological modeling.

SLR, 2021a McKay Point Reservoir Project – Geology and Soils Technical Study, November, 2021

U.S. EPA, "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems", EPA 600/R-08/003, January 2008.

FIGURES

Figure D3-1. Leapfrog-Generated Modflow Grid (Domain)

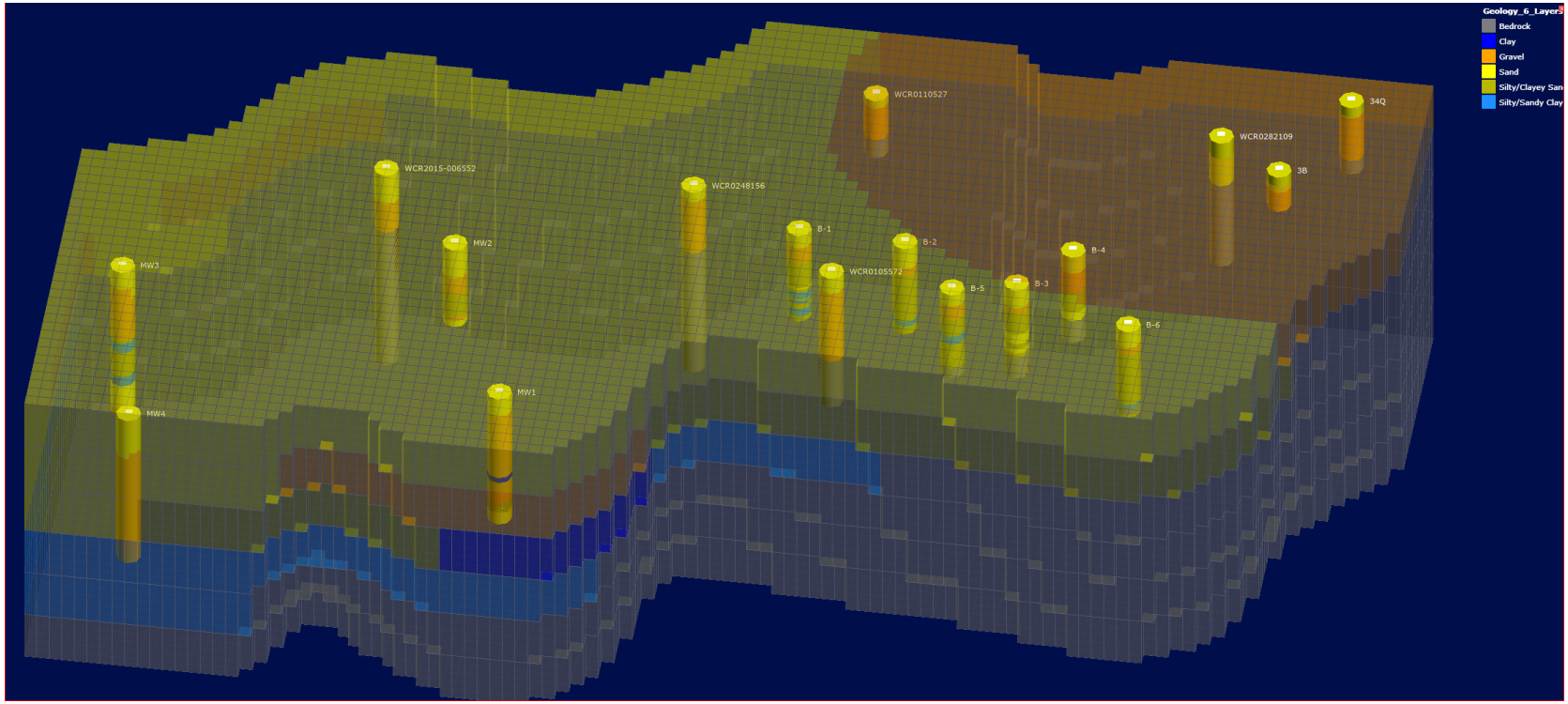


Figure D3-2. Leapfrog-Generated Modflow Six Layers (Domain, Cross-sectional view, Vertical Exaggeration X5)

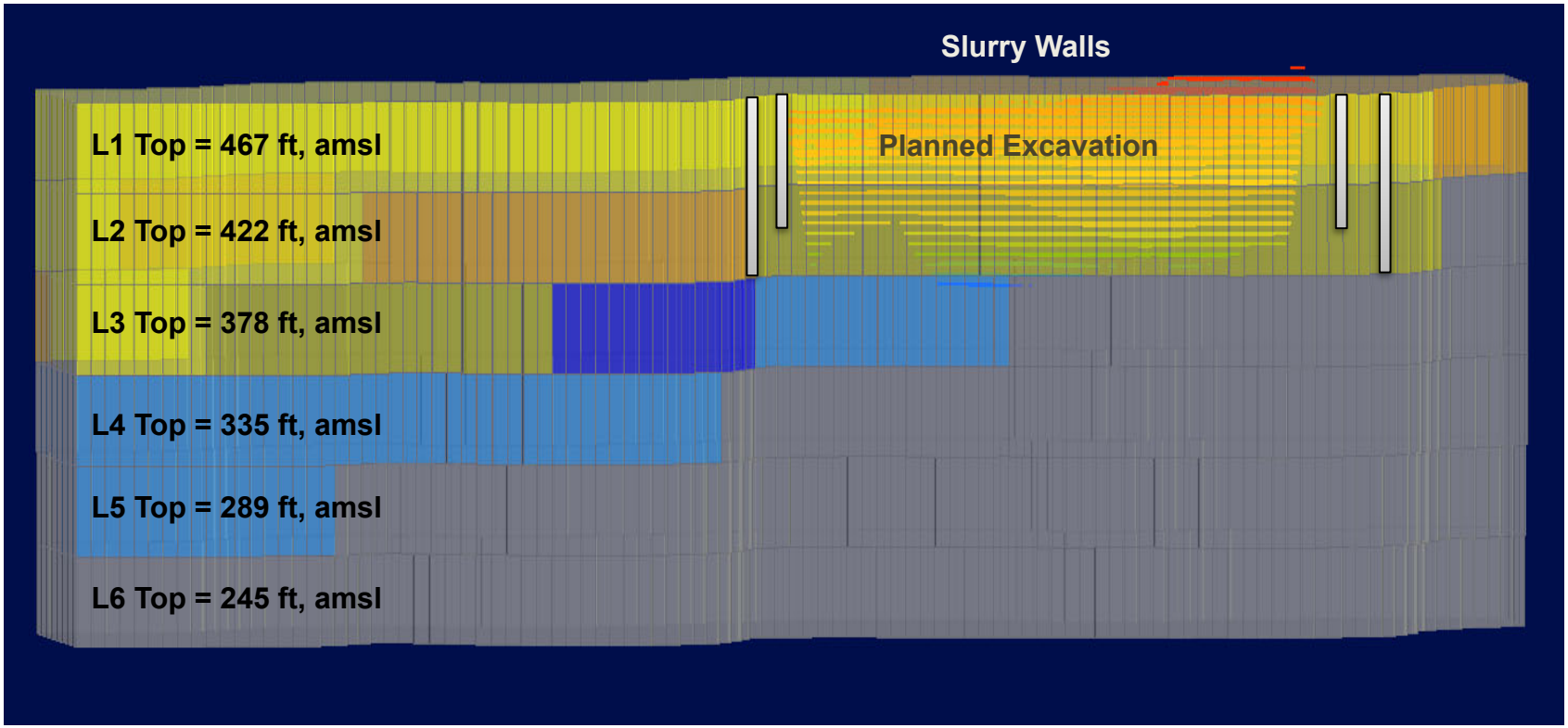


Figure D3-2. Leapfrog-Generated Modflow Six Layers (Domain)

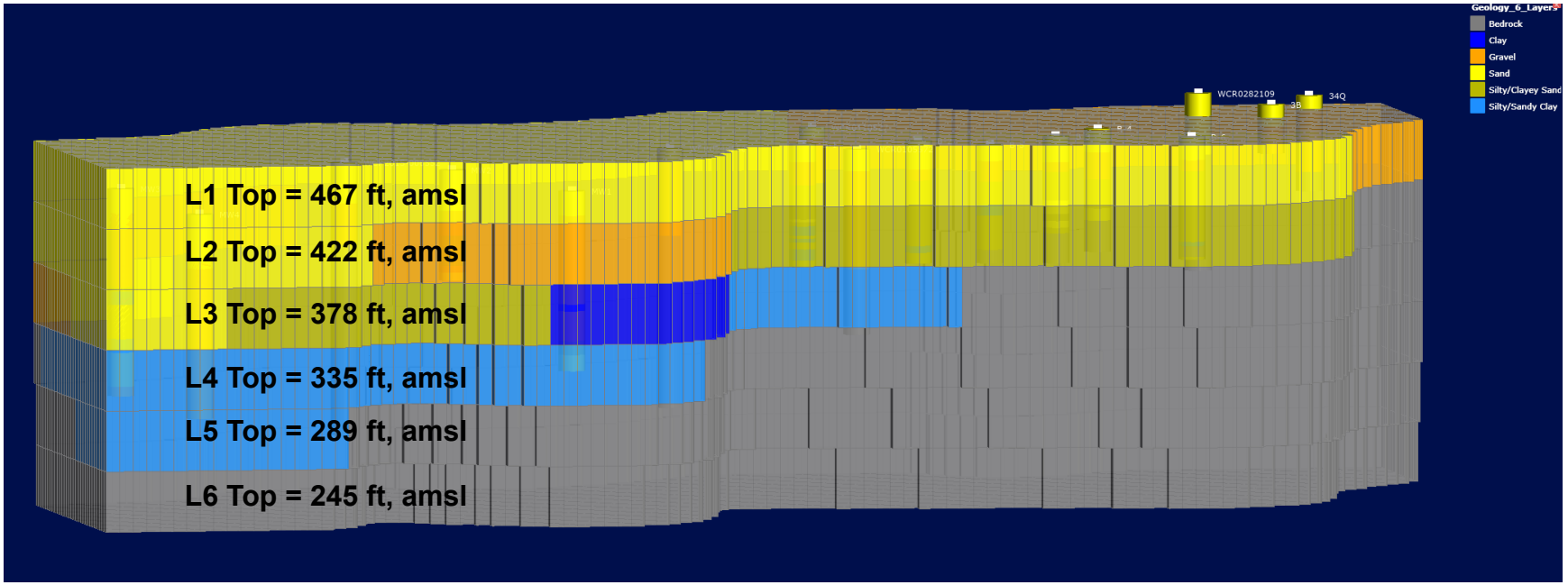


Figure D3-3 Potentiometric Surface- Natural Condition [ft, amsl, Vertical Exaggeration X5]

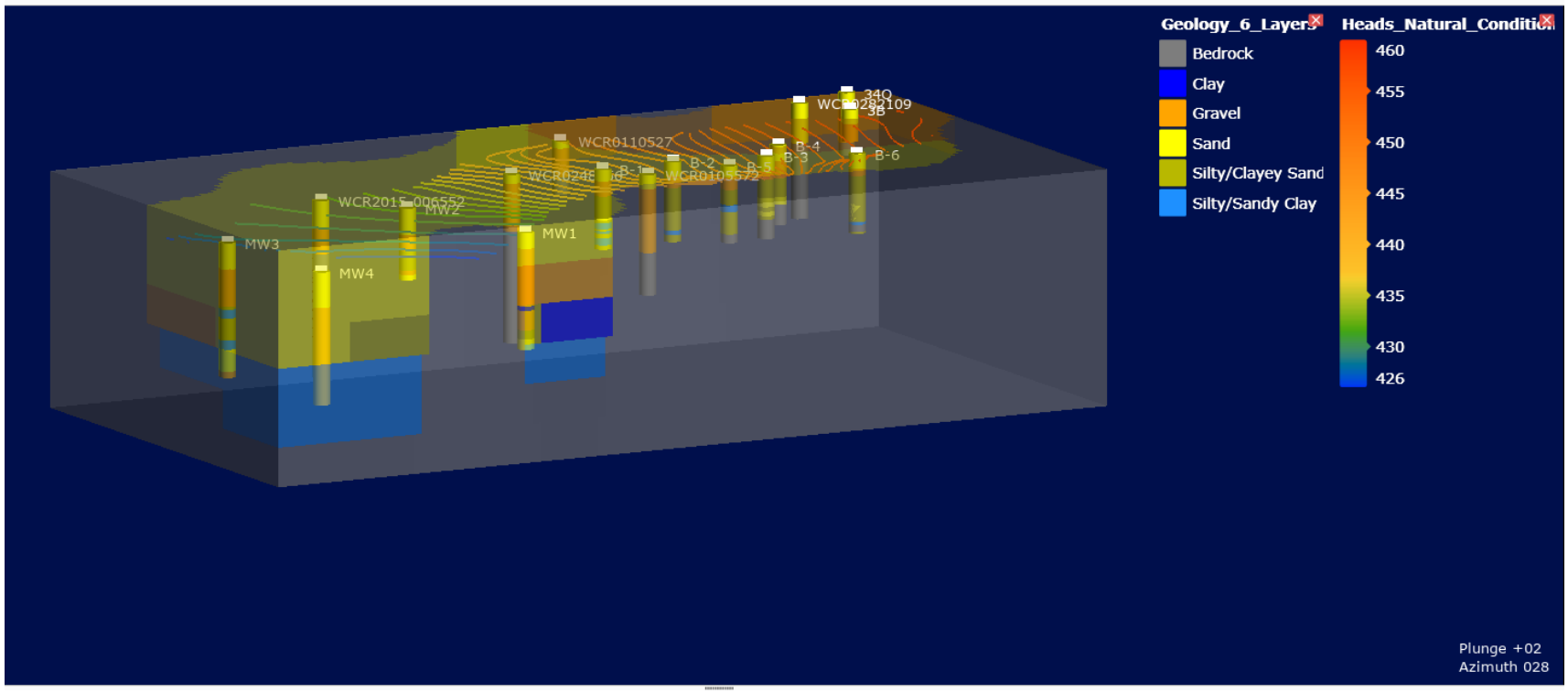


Figure D3-4 Potentiometric Surface Resulting from the Placement of the Reservoir [Scenario 1; Vertical Exaggeration X5, ft, amsl]

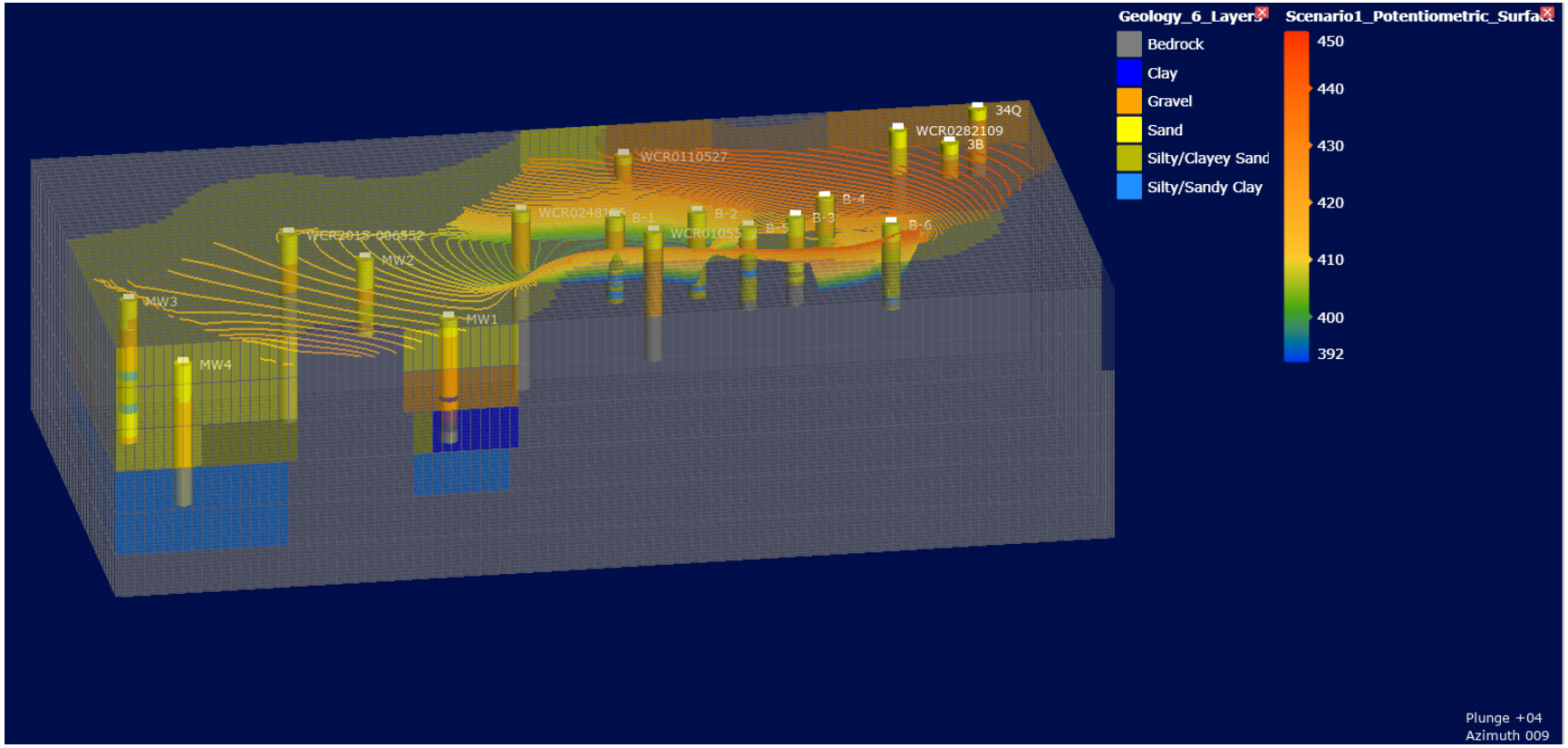


Figure D3-5a Water Levels Comparison in Layer 1 [Scenario 1 vs. Natural Condition, Cross-sectional and Map views, ft, amsl]

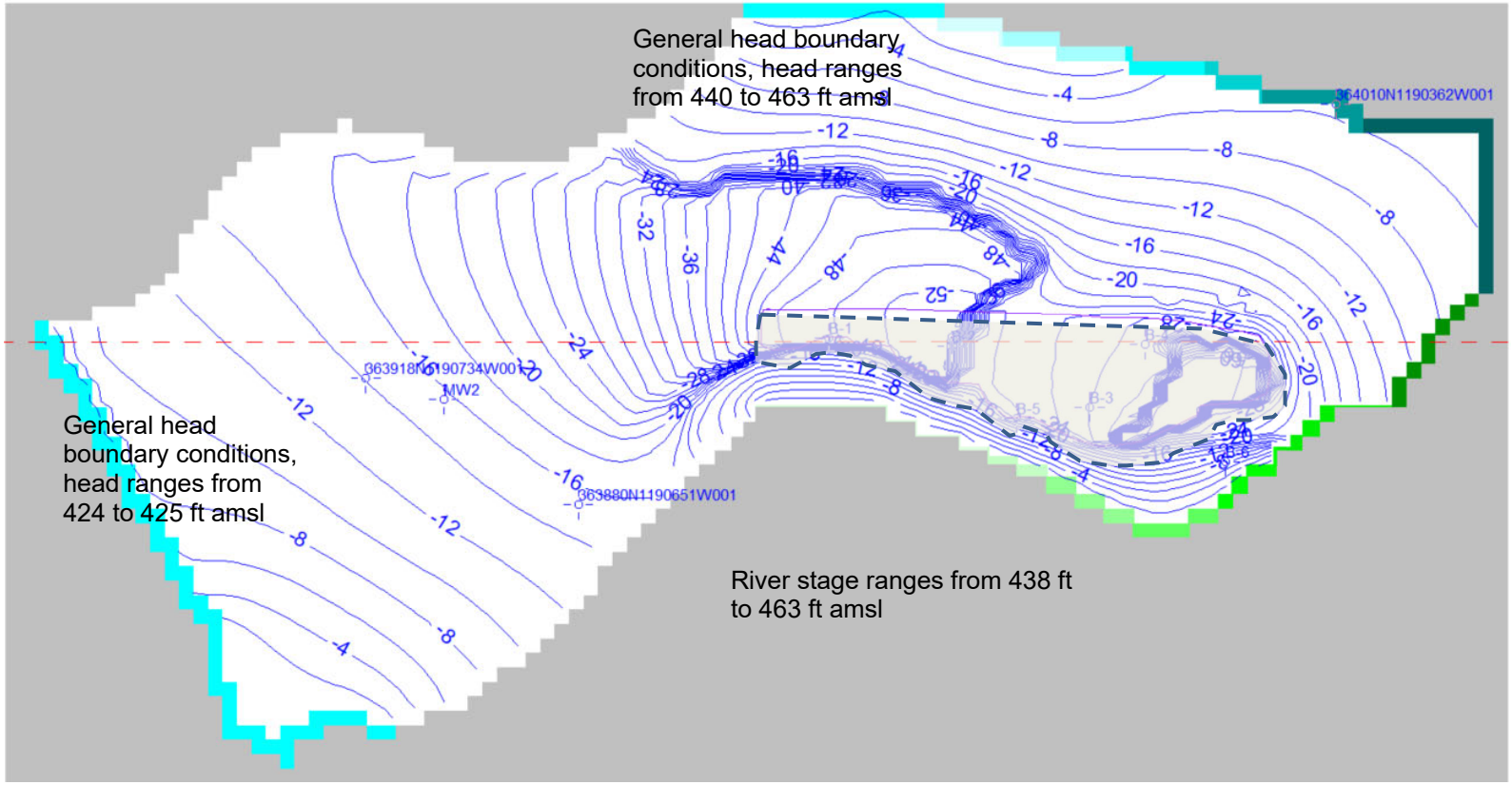


Figure D3-5b Water Levels Comparison in Layer 2 [Scenario 1 vs. Natural Condition, Cross-sectional and Map views, ft, amsl]

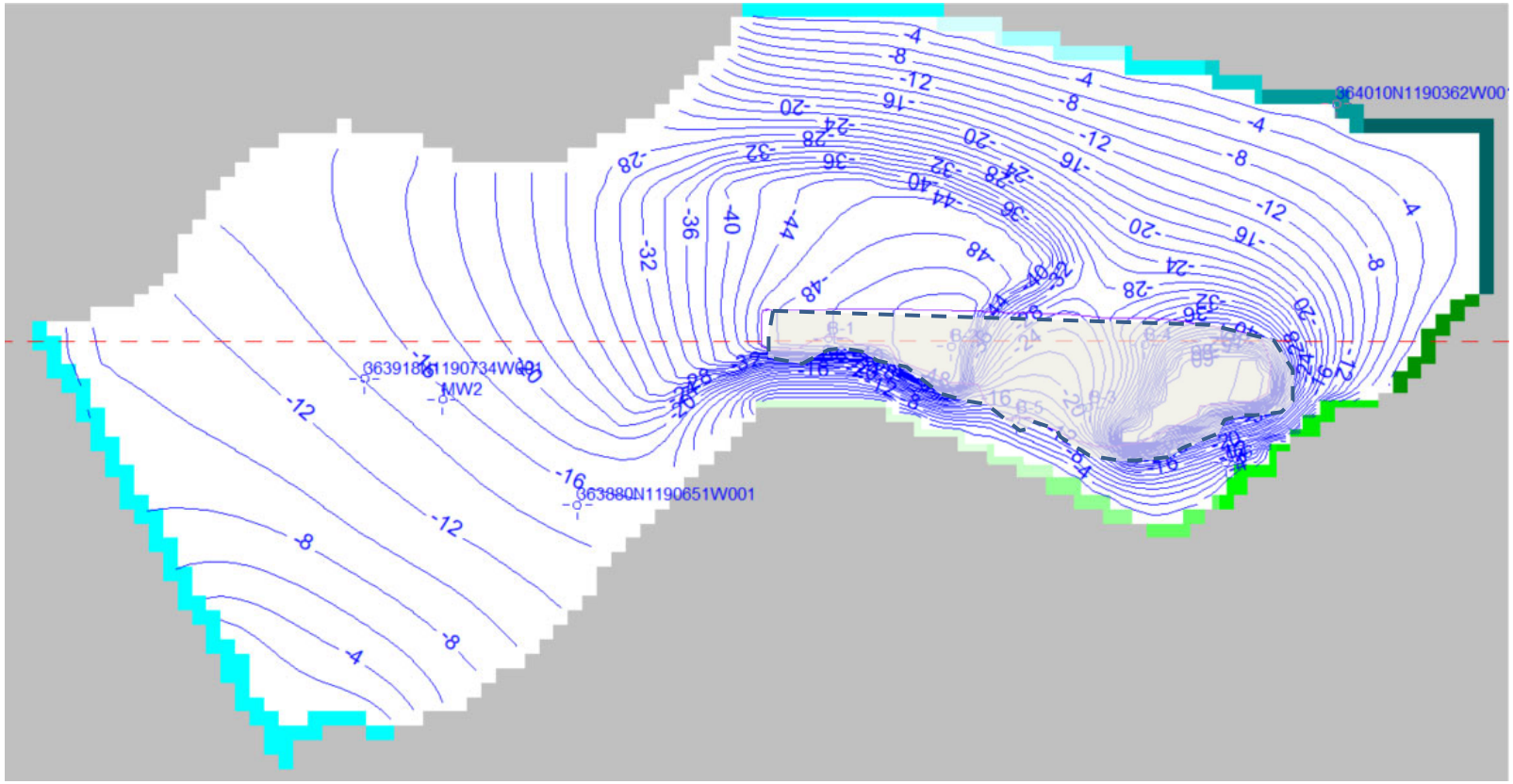


Figure D3-6 Potentiometric Surface Resulting from the Placement of the Reservoir and Slurry Walls [Scenario 2; Vertical Exaggeration X5, ft, amsl]

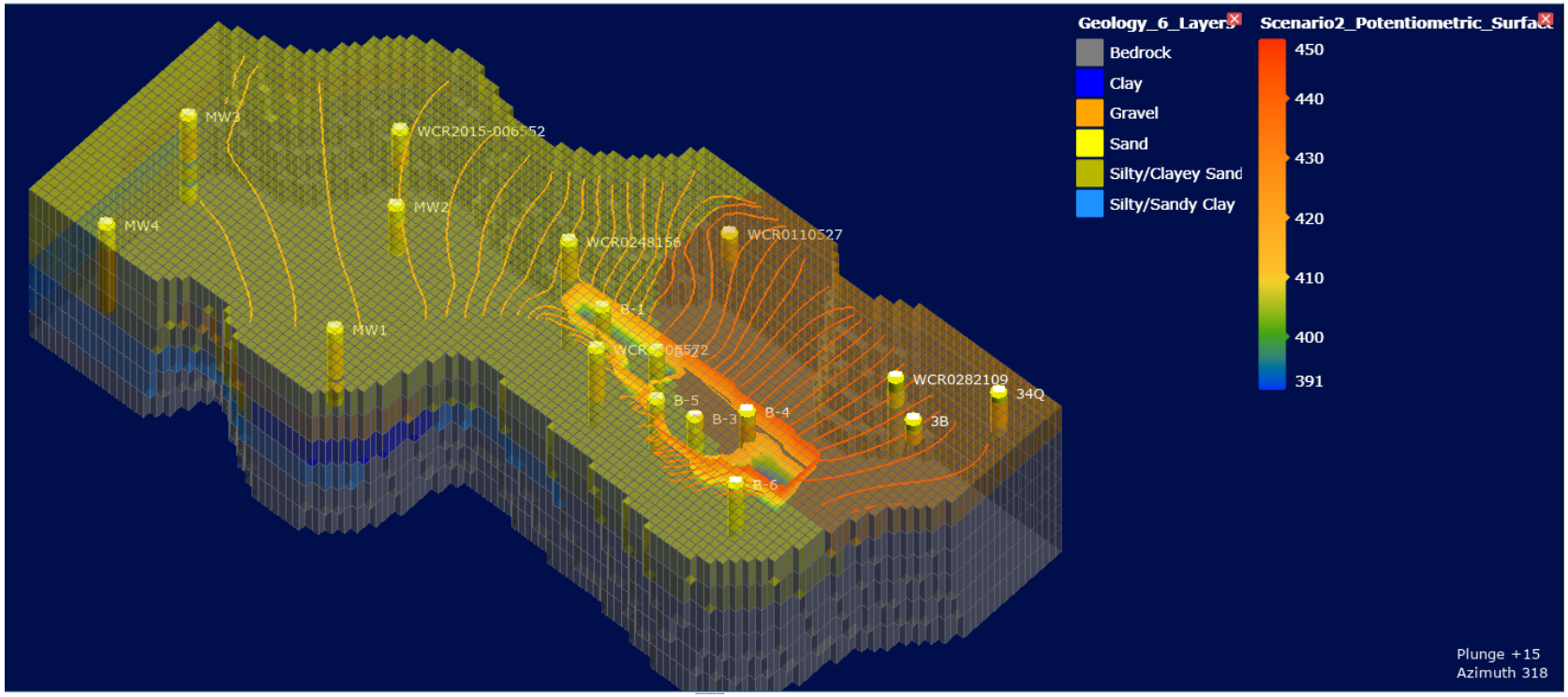


Figure D3-7a Water Levels Comparison in Layer 1 [Scenario 2 vs. Natural Condition Water Levels, Map view, ft, amsl]

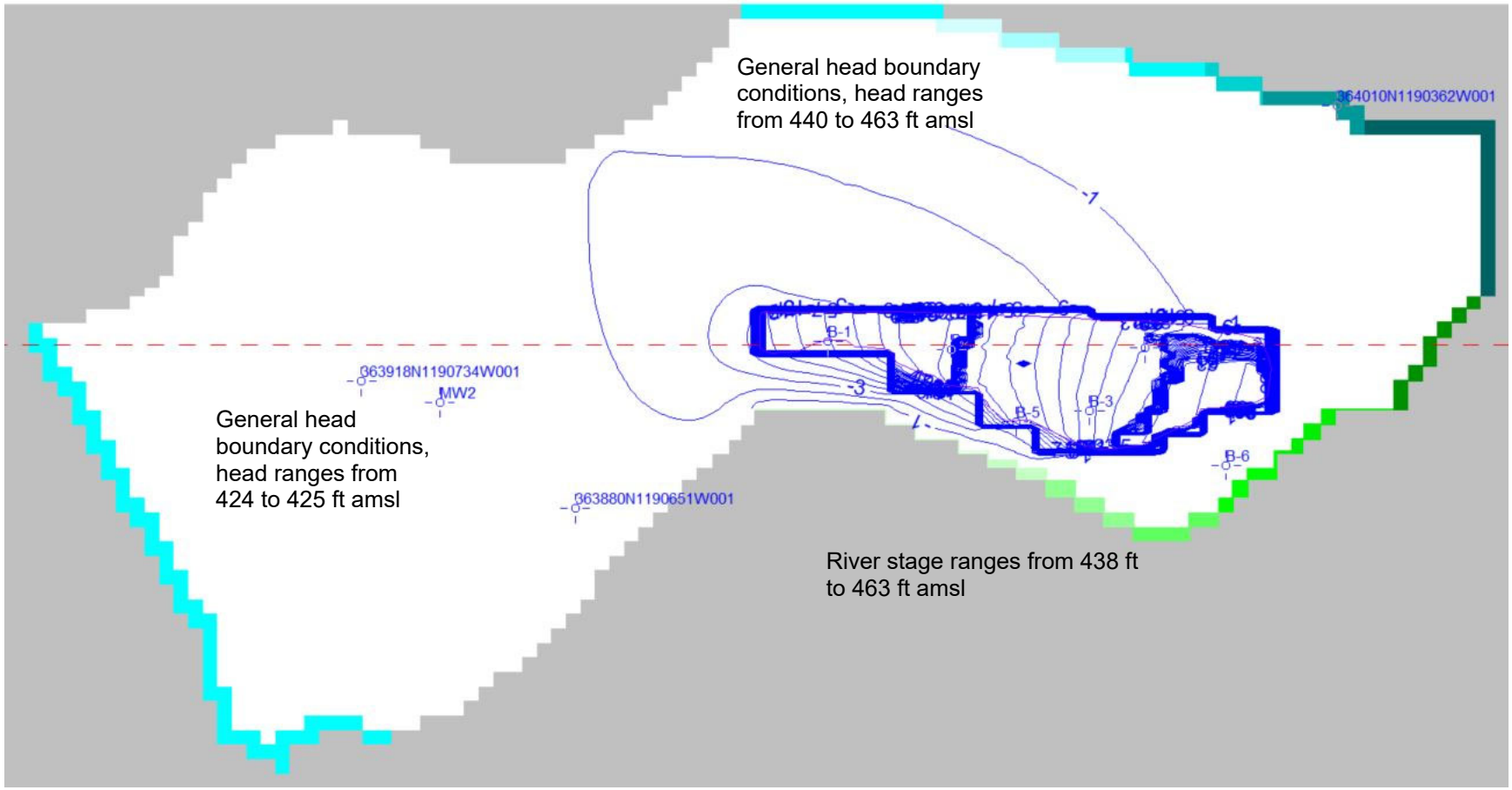


Figure D3-7b Water Levels Comparison in Layer 2 [Scenario 2 vs. Natural Condition Water Levels, Map view, ft, amsl]

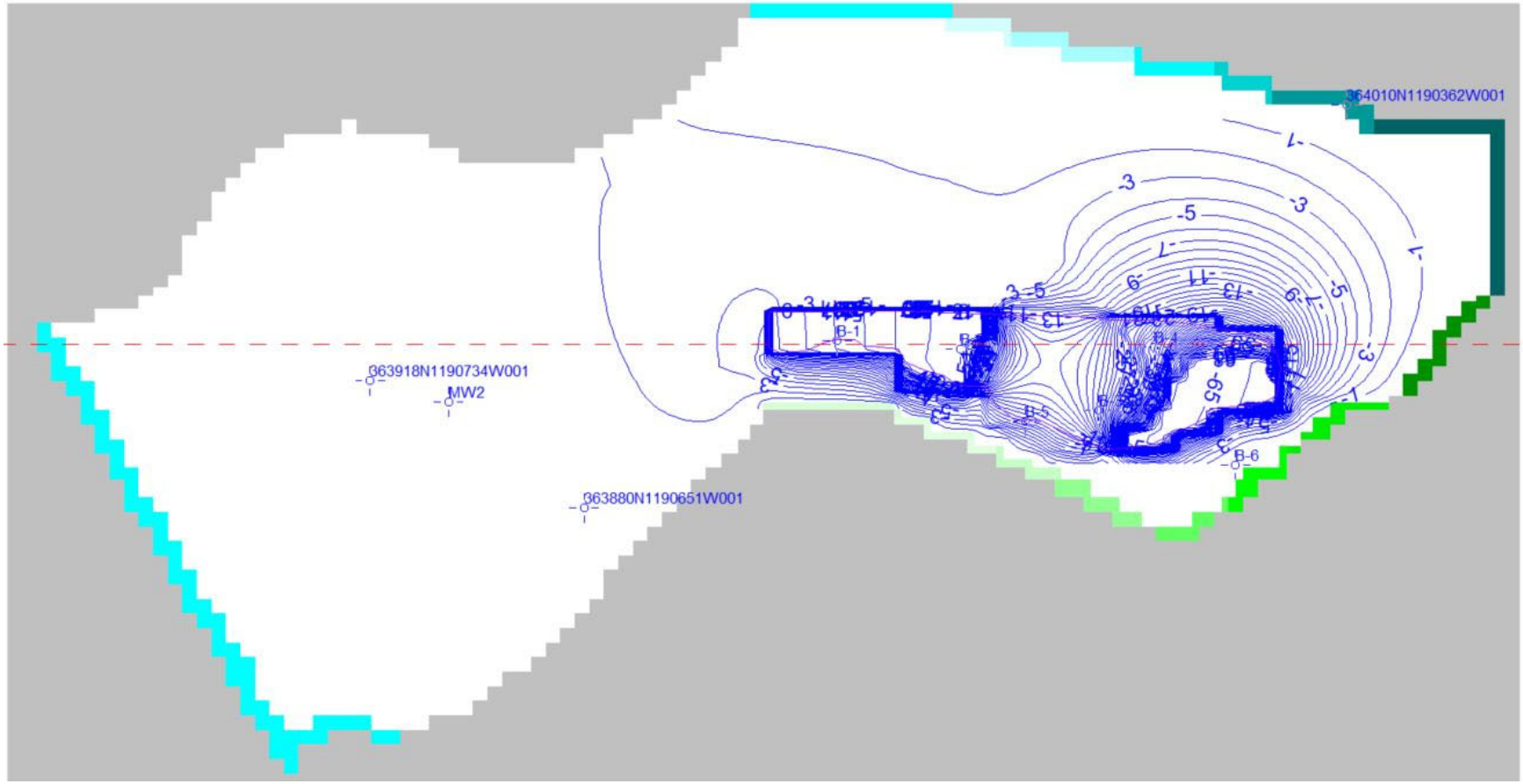


Figure D3-8 Potentiometric Surface Resulting from the Placement of the Reservoir, Slurry Walls and Infiltration Trench [Scenario 3; Flux of ~ 70 gpm, Vertical Exaggeration X5, ft, amsl]

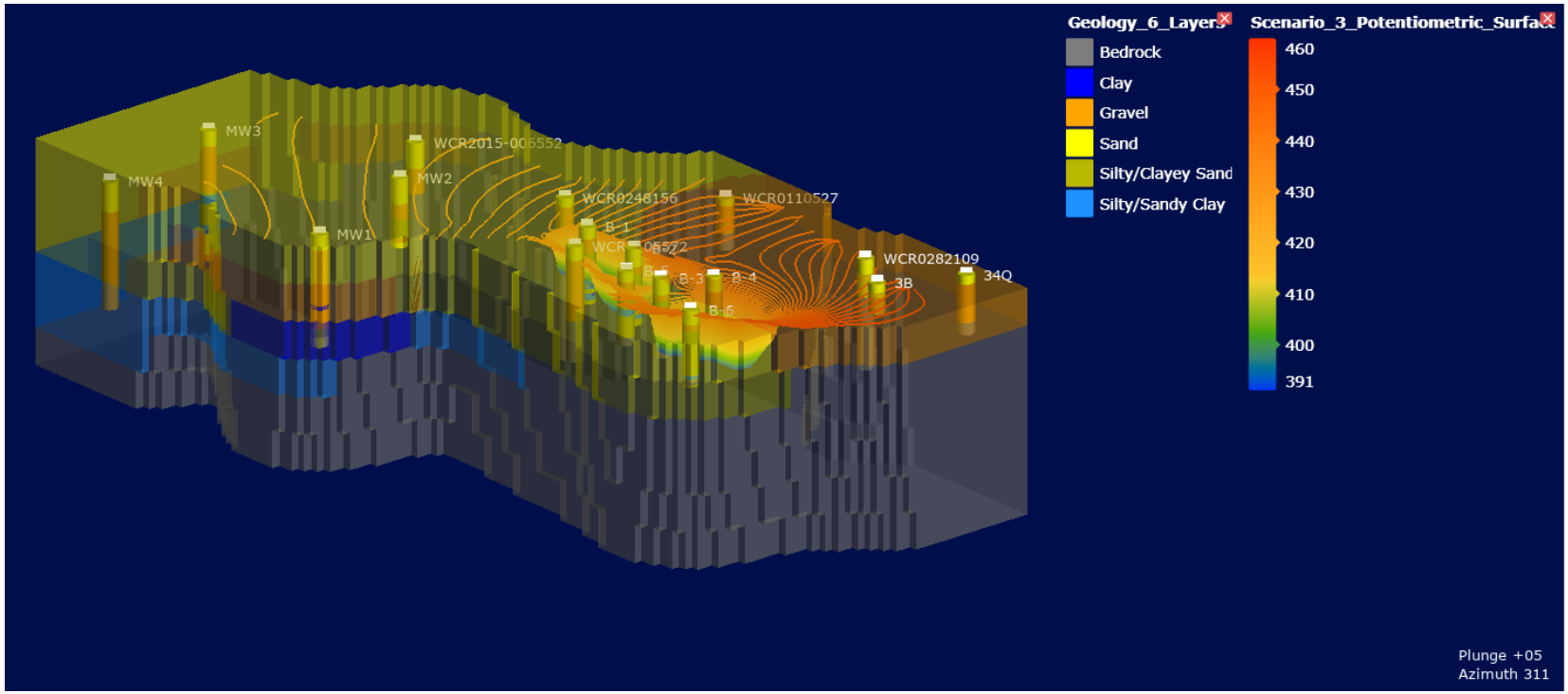


Figure D3-9a Water Levels Comparison in Layer 1 [Scenario 3 vs. Natural Condition, Map view, ft, amsl]

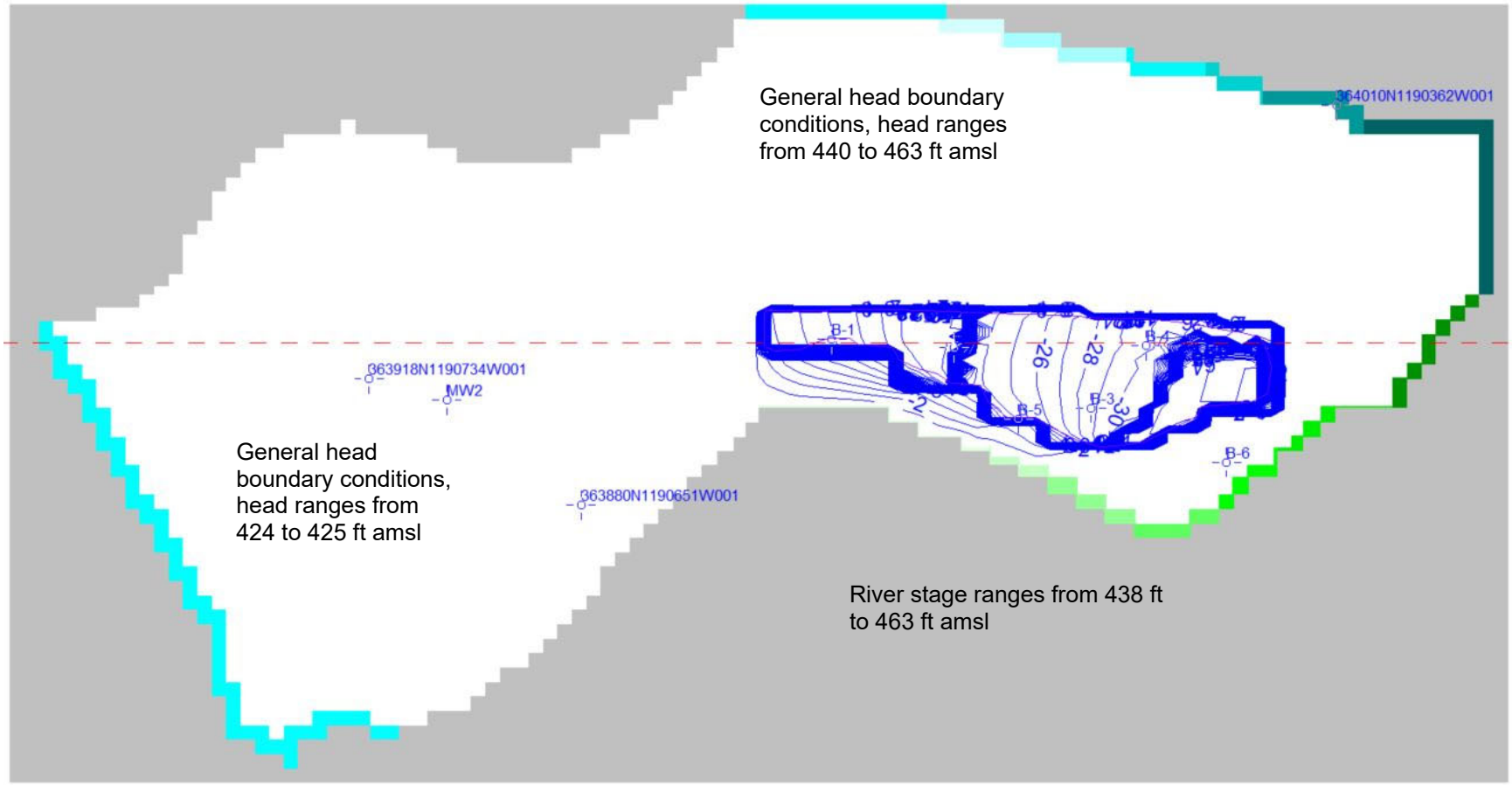
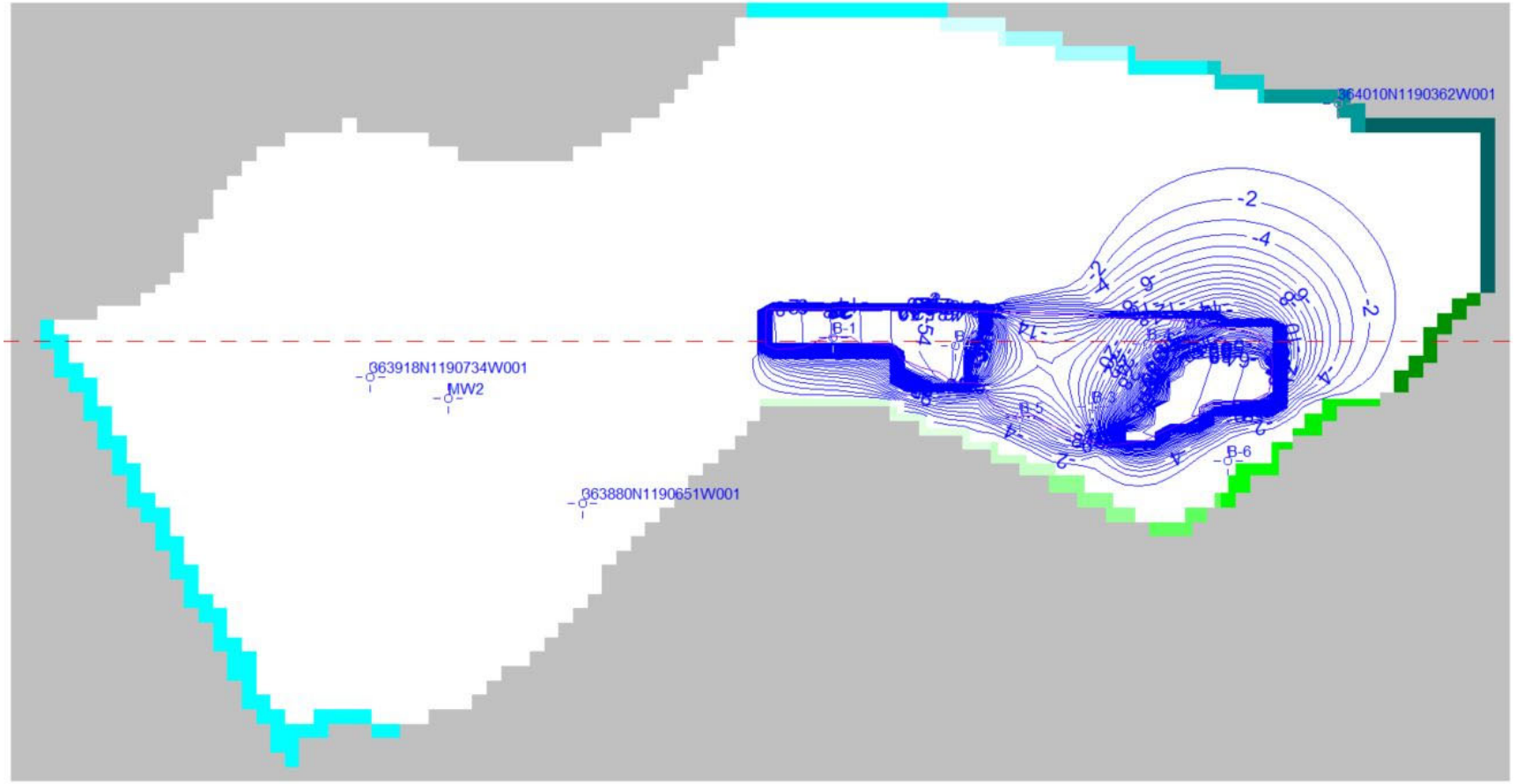


Figure D3-9b Water Levels Comparison in Layer 2 [Scenario 3 vs. Natural Condition, Map view, ft, amsl]



APPENDIX H

Noise Impact Assessment
(Sespe Consulting, Inc., 2021)

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NOISE IMPACT ASSESSMENT

MCKAY POINT RESERVOIR PROJECT

Tulare Irrigation District
Tulare County, California

September 2021

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NOISE IMPACT ASSESSMENT

MCKAY POINT RESERVOIR PROJECT

Tulare Irrigation District
Tulare County, California

September 2021

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Sespe Consulting, Inc.

Noise Impact Assessment
McKay Point Reservoir Project

Tulare Irrigation District
September 2021

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NOISE IMPACT ASSESSMENT

Tulare Irrigation District
McKay Point Reservoir Project

September 2021

1.0 INTRODUCTION

Sespe Consulting, Inc. ("Sespe") has prepared the following Noise Impact Assessment (NIA) on behalf of the Tulare Irrigation District (TID), to determine noise impacts associated with the development and operation of the proposed McKay Point Reservoir Project ("Project"). The TID, the Consolidated Peoples Ditch Company (CPDC), and the Visalia and Kaweah Water Company (VKWC), collectively referred to as the "Owners", own approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, referred to as the McKay Point property. The Owners propose to develop approximately 200 acres within the 500-acre McKay Point property into a surface water storage and re-regulation reservoir. The reservoir would be located on the north side of the divergence of the Lower Kaweah River and St. Johns River, in unincorporated Tulare County (see Figure 1 and Figure 3, Appendix A).

This NIA quantifies the results of background noise monitoring and assesses potential noise impacts associated with the development and operation of the proposed Project on nearby sensitive receptors. Project impacts are presented and compared to applicable noise criteria, and mitigation measures are recommended for receptors where noise impacts were found to be above applicable regulatory thresholds.

TID is currently preparing a Draft Environmental Impact Report (Draft EIR) for the Project, and this NIA will be included as a technical appendix within that document. The TID is the Lead Agency for purposes of administering the requirements of the California Environmental Quality Act (CEQA), and for preparing the Draft and Final EIR.

2.0 PROJECT DESCRIPTION

2.1 Location

The Project site is located in unincorporated Tulare County, on the north side of the divergence of the Lower Kaweah River and St. Johns River. The existing Project site is primarily undeveloped grassland that has historically been used for cattle grazing under lease arrangements. The Project site is bounded by the Lower Kaweah and St. Johns Rivers to the south; an existing aggregate mining and processing facility, known as the Seaborn site, to the west; and, the existing CEMEX Lemon Cove aggregate facility to the north and east. Additionally, various agricultural, residential land uses, including a single-family residence owned by TID, and the Kaweah South Project lies (approximately 1.0 miles away) are located farther south across the Lower Kaweah and St. Johns Rivers. Please see Figure 1 and Figure 2 (Appendix A) which display the McKay Point site and the environmental setting within the immediate vicinity of the Project.

The Project site lies to the south of both Lake Kaweah (approximately 2.5 miles to the northeast) and Bravo Lake (approximately 1.3 miles to the northwest). Nearby communities include the unincorporated community of Lemon Cove (approximately 1.0 miles to the southeast) and the City of Woodlake (approximately 2.5 miles to the northwest). Nearby prominent roadways include State Route 216 (SR-216)/Lomitas Drive (approximately 0.5 miles to the north) and State Route 198 (SR-198)/Sierra Drive (approximately 0.9 miles to the east). Please see Figure 1 through Figure 2 (Appendix A) which shows the regional and local Project site setting.

2.2 Objectives and Benefits

The Project would consist of the following three (3) distinct phases: 1) excavation of the site for the reservoir; 2) construction of the reservoir; and, 3) operation of the reservoir. The Owners intend to enter into a lease agreement with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation phase and construction of the reservoir structures, the McKay Point Reservoir would be used as a surface water storage/re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas. Ultimately, once operational, the Owners would utilize the reservoir and its facilities to manage their surface water supplies to increase the long-term availability of irrigation supplies, groundwater recharge supplies, via water re-regulation.

2.3 McKay Point Reservoir Operations/Phases

Before the reservoir can be constructed, the site must first be prepared. The preparation of the site includes the excavation of a pit/basin with sufficient capacity to meet the Owner's needs for water storage. After the pit has been sufficiently excavated and prepared, the reservoir and ancillary structures (e.g., perimeter road, storage tanks, etc.) would then be constructed. Once constructed, the reservoir would be maintained by the Owners and serve as a surface water storage/re-regulation reservoir. As discussed above, the Project would entail the following three (3) discrete phases: 1) Reservoir Excavation; 2) Reservoir Construction; and, 3) Reservoir Operations/Maintenance. The following is a brief discussion of the Project phases, which are individually analyzed within this NIA.

2.3.1 Reservoir Excavation

WCA would excavate the reservoir basin to a depth and surface area sufficient to meet the Project's desired water storage capacity requirements. Specifically, excavation of the Project site would result in an open pit with a surface area of approximately 110 acres and a final depth of approximately 60-feet

below ground surface (bgs). WCA would begin onsite excavation activities at-grade in a single location, and progress downward in that location until the final excavation depth of 60-feet bgs is reached. From there, excavation would then progress at a depth of 60-feet bgs throughout the entirety of the 110-acre Project site, until the pit is fully excavated. It is estimated that approximately 16.5 million gross tons of material will be extracted over an approximately 20-year reservoir excavation phase (may fluctuate depending on market demand). Please see Figure 3 (Appendix A) which shows a schematic of the reservoir and specific design components of the excavation phase.

WCA would process the excavated material onsite using portable processing/wash plant, and at times a portable crushing/recycle plant. Material would be excavated using mobile equipment (e.g., dozers, excavators, etc.) and placed directly into the aggregate processing plant where it would be sized and sorted into marketable products. Due to the type of material to be excavated (i.e., river alluvium), permanent crushing operations will not be required; however, at times WCA may bring a temporary portable crushing/recycle plant onsite to break up oversized pieces of rock prior to screening in the processing/wash plant. The crushing/recycle plant could also be used to recycle used concrete and asphalt brought in from offsite. It is expected the onsite portable crushing/recycle plant would be operated infrequently. Additionally, only one of these two plants (i.e., aggregate processing plant or portable crushing/recycle plant) would be in use at any given time, and the plants would not operate simultaneously. Once processed, marketable materials (e.g., sand, stone, gravel, etc.) would be placed directly into on-road haul trucks by a loader, and delivered to WCA's customers throughout Tulare County. The ingress and egress point for haul trucks and other worker vehicles would be the existing entrance located in the western portion of the Project site, which connects to an existing surface mining facility known as the Seaborn site (see Figure 2, Appendix A). Section 5.1 provides a detailed summary of the onsite equipment required during the reservoir excavation phase.

As discussed above, marketable material excavated/processed at the Project site (i.e., McKay Point) would be transported through the adjacent Seaborn facility for delivery to customers. Sand and gravel (aggregate) mining and processing activities have been conducted at the Seaborn site since the late 1940's. The excavation and storage of aggregate during the reservoir excavation phase of the Project would be coordinated with WCA, such that the historical maximum production rate historically associated with the adjacent Seaborn facility would not be exceeded. Specifically, WCA's annual production rate at the McKay Point site would not exceed production rates (i.e., baseline) of an average of 500,000 tons per year (TPY) and a maximum of 650,000 TPY (these rates were achieved by the Seaborn facility in 2005). Consequently, the number of on-road haul trucks transporting material offsite on public roads to WCA's customers would not increase above baseline levels associated with the Seaborn facility. Similarly, the number of employees and associated work vehicle trips would also not increase, and would most likely decrease, compared to baseline levels. Therefore, noise impacts associate with haul truck activities/traffic, both onsite and on public roadways, was not analyzed in this NIA.

Reservoir excavation operations will occur Monday through Saturday (except holidays), between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or earlier if sundown). Approximately four (4) to eight (8) daily onsite employees would be required during the reservoir excavation phase, working in two (2) shifts per day; however, this is lower than the seven (7) to twelve (12) employees who historically worked at the adjacent Seaborn facility. Because the hours of operation and number of onsite employees will not increase, and will most likely decrease, compared to historical (i.e., baseline) levels, noise from employee vehicle trips was not analyzed. Reservoir excavation Project phase will generally entail the following activities, which are analyzed in this NIA:

- Mineral resource extraction activities in one (1) phase to develop a reservoir basin. Reservoir excavation/material extraction would occur over an approximate 110-acre area, and reach a maximum depth of 60-feet below natural ground surfaces. The pit design incorporates a final slope configuration of 3:1 (horizontal to vertical).
- Construction and maintenance of onsite roads, including an earthen perimeter access road as shown on Figure 3 (Appendix A).
- Operation of the processing/wash plant (i.e., aggregate plant) to size and sort excavated material. Infrequent use of a portable crushing/recycle plant brought onsite to process oversize and/or imported materials. Processing equipment will generally occur in the bottom of the excavation pit, and the plant(s) will be relocated adjacent to active mining areas as excavation progresses. As discussed previously, only one plant would operate at a given time (i.e., no simultaneous operations).
- Operation of onsite mobile equipment (i.e., haul trucks, loaders, scrapers, water trucks and related equipment) to excavate, and transport materials as needed.
- Conduct all reservoir excavation activities, as described above and herein, on an approximately 110-acre site as shown on Figure 3 (see Appendix A).

Groundwater Management within the Excavation Pit: To prevent groundwater intrusion into the excavation area, a slurry wall will be installed around the perimeter of the pit (see Figure 3, Appendix A) to minimize groundwater seepage into/out of the reservoir basin. The slurry wall(s) will be a below-grade wall that restricts groundwater flow and supports pit walls, using soil-bentonite or cement-bentonite. Additionally, due to the nature of the clay material present at the Project site, a clay liner could also be used as an alternative to a slurry wall, assuming infiltration into the pit can be maintained below 500 gallons per minute (gpm). It is assumed that the slurry wall or clay liner would be installed early in the excavation phase to slow or eliminate groundwater from flowing into the pit. The slurry wall/clay liner would also remain as permanent structure to maintain the reservoir in an empty state as part of the long-term operations (i.e., a full reservoir would have limited water re-regulation value).

Construction of the slurry wall and/or clay liner would be accomplished using the same mobile equipment (loaders, excavators, haul trucks, etc.) and stationary equipment (i.e., processing plant[s]). Additionally, the operational parameters (e.g., operating hours, number of onsite employees, etc.), would remain the same.

2.3.2 Reservoir Facility Construction

Once the reservoir basin is fully excavated and stabilized, construction of the reservoir facilities will commence. The following components/structures, illustrated on Figure 4 (Appendix A), would be constructed or installed during the reservoir construction Project phase:

- Inflow channel and associated electrically operated weir;
- Inflow chute, with an associate energy dissipation pool;
- Floating barge pump (to deliver water upstream to the Kaweah River) and discharge piping;
- Aboveground diesel tank, generators and generator building;
- Outflow channel (deliver water to the St. Johns River) and associated electrically operated weir;
- Access gate(s), as needed; and
- Perimeter berm, perimeter road and truck turnaround (the inflow and outflow channels will pass

under the perimeter road in concrete structures).

The inflow and outflow structures would require some excavation and grading to prepare the site for installation. Specifically, inflow/outflow channel grading would consist of clearing and grubbing of approximately 3 acres, excavation of 20,000 cubic yards of material, and the placement of approximately 9,000 cubic yards of rip-rap to prevent erosion. Construction of the in/out-flow building would consist of finish grading and minor excavation of approximately 600 cubic yards of additional material, and the placement of approximately 1,100 cubic yards of concrete.

During the reservoir construction phase, off-road mobile equipment (e.g., excavators, loaders, water truck, etc.) similar to the equipment required during the reservoir excavation phase will operated onsite; however, at times a cement truck, crane and/or portable generator may also be required. Additionally, no onsite material processing will occur during reservoir construction. Section 5.2 provides a detailed summary of the onsite equipment required during reservoir construction. The number of employees and operating hours would remain unchanged, or possible decrease, compared to the reservoir excavation phase. Please see Figure 4 (Appendix A) which shows the design of the reservoir facilities, and various structures that will be constructed during this Project phase.

2.3.3 Reservoir Operation

Once constructed, the Owners would utilize the McKay Point reservoir and its associated facilities to manage their surface waters to increase the long-term availability of irrigation supplies and groundwater recharge supplies via water re-regulation. As discussed above, the reservoir structures would consist of various check structures on the St. Johns and Lower Kaweah Rivers, each with automated gates. The structures could be operated such that the gates on the St. Johns River side could be raised, therefore shunting more flows down the Lower Kaweah River. Because CPDC, VKWC, and TID hold many of the rights to the waters of the Kaweah River system, water released from the reservoir and shunted into the Lower Kaweah River in this manner would serve CPDC and VKWC customer needs, as well as TID customer needs if necessary.

In a similar manner, the McKay Point Check Structures could be operated such that the gates on the Kaweah River side could be raised, therefore shunting more flows down the St. Johns River. Because TID holds rights to waters of the St. Johns River, water released via the outflow channel would serve TID customer needs. Please see Figure 4 (Appendix A) which shows the final layout of the completed reservoir, including the locations of check structures and related inflow/outflow channels.

During ongoing reservoir operations and management, the Owners would have daily control over the reservoir and related facilities, which include the use of the Supervisory Control and Data Acquisition (SCADA) equipment to monitor and control the facility remotely. SCADA equipment would permit remote monitoring, control, and operations by TID operators from TID's offsite office. In addition, TID operators would have the ability to set the control gates in either a condition of flow control or level control. In flow or level control, the gates would autonomously operate to maintain a desired flow, or a desired elevation, respectively, in the river channels. Through these remote and automated controls, TID’s onsite activities would be limited during the reservoir operations/maintenance phase.

An approximately 10,000-gallon diesel aboveground storage tank (AST), diesel generators, and a generator building near the inflow chute would be installed and used during reservoir operations. The diesel generators would provide power periodically to the floating pump station as needed.

During the ongoing reservoir operations/maintenance phase, TID staff would perform routine onsite inspections to ensure the reservoir is operating properly. The routine onsite maintenance of the Project would be conducted by TID's staff based at their offsite office; therefore, the number of employees routinely driving to the Project site would be minimal, and would be far less than during the previous reservoir excavation and construction phases. Operation and maintenance of the Project would generate only nominal onsite noise and traffic primarily associated with maintenance operations. During the operations and maintenance of the reservoir, there would be limited equipment usage, but equipment could be needed to perform minor grading of the access road and to remove any debris that collects in the bottom of the reservoir. TID estimates that onsite maintenance and related operations using mobile equipment would occur only a few times annually (approximately 1 to 3 days per year).

3.0 EXISTING SETTING

The McKay Point Reservoir Project site is located in unincorporated Tulare County, north of the divergence of the Lower Kaweah and St. Johns Rivers. Existing mining/aggregate operations bound the Project site to the west (Seaborn facility), and to the north and east (CEMEX's Lemon Cove facility). The site is bounded by the Lower Kaweah and St. John's Rivers to the south, with agricultural and rural residential land uses further south across the rivers. Please see Figure 2 (Appendix A) which shows the Project site and surrounding environment.

Though the Project site is located in a generally isolate/undeveloped area. Nearby communities include the community of Lemon Cove (approximately 1.0 mile southeast of the site) and the City of Woodlake (approximately 2.6 miles northwest of the site). As discussed previously, nearby prominent roadways include SR 216/Lomitas Drive (approximately 0.5 miles to the north) and SR 198/Sierra Drive (approximately 0.9 miles to the east). The McKay Point site is accessed via an existing ingress/egress point along the western boundary of the Project site, which connects to the existing Seaborn facility to the west and eventually connects to Road 222. Please see Figure 2 (Appendix A) which shows the layout of the Project site, the access route, and the adjacent environmental setting.

The following sections discuss the existing noise and vibration regulatory and environmental settings applicable to the Project.

3.1 Regulatory Setting & Noise Fundamentals

This section discusses the Project's regulatory setting. Specifically, the Tulare County *General Plan – Noise Element* (Tulare County, 2012) and the Tulare County *Lemon Cove Community Plan 2019* (Tulare County, 2019). Noise and vibration standards from the Federal Highway Administration's (FHWA) *Roadway Construction Noise Model* (Federal Highway Administration, 2006), and applicable guidance from the California Department of Transportation's (Caltrans) are also discussed in this section. Please note, the Tulare County Code (Tulare County, 2020) does not contain any noise ordinances nor does it set specific restrictions related to noise.

3.1.1 Definitions

The following terms are employed in this NIA:

- **Decibel (dB):** A unit division, on a logarithmic scale, whose base is the tenth root of ten, used to represent ratios of quantities proportional to power. In simple terms, if the power is multiplied by a factor of ten, then ten is added to the representation of the power on the decibel scale. If 0 dB represents 1 unit of power, 30 dB represents one thousand units, 60 dB represents one million units, etc.
- **A-Weighted Sound Level (dBA):** Sound pressure level measured using the A-weighting network, a filter which discriminates against low and very high frequencies in a manner similar to the human hearing mechanism at moderate sound levels. The A-weighted sound level is generally used when discussing environmental noise impacts.
- **Maximum Noise Level (L_{max}).** The instantaneous maximum noise level measured during the sample.
- **Equivalent Continuous Noise Level (L_{eq}).** The average noise level over a designated time period. This is often referred to as "equivalent sound level", hence the "eq" subscript. The "equivalence"

is to a sound of constant level that has the same total acoustic energy content.

- **Ambient (i.e., Background) Noise Level:** The current noise level in the vicinity of the proposed Project that results from the combination of all sources, near and far. Please note, ambient noise measurements presented in this NIA include existing noise generated by existing aggregate mining and processing facility adjacent to the McKay Point property (see Section 3.2).
- **Day-Night Average Level (L_{dn} – dBA):** The long-term time average sound level, weighted as follows:
  - Frequency response is filtered using the A-weighting network;
  - Daytime noise (7:00 a.m. – 10:00 p.m.) is not weighted; and
  - Nighttime noise (10:00 p.m. – 7:00 a.m.) is weighted by +10 dB.
- **Community Noise Equivalent Level (CNEL – dBA):** The long-term time average sound level, weighted as follows:
  - Frequency response is filtered using the A-weighting network.
  - Daytime noise (7:00 a.m. to 7:00 p.m.) is not weighted.
  - Evening noise (7:00 p.m. and 10:00 p.m.) is weighted by +5 dB.
  - Nighttime noise (10:00 p.m. and 7:00 a.m.) is weighted by +10 dB.

3.1.2 Characteristics of Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second) they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 decibels (dB). Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness as presented in Table 1.

The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the sound level pressures between 1,000 and 5,000 Hz, which represent the most sensitive frequencies perceived by a healthy human ear and coincidentally the natural frequency range of human speech. This weighting network is referred to as the A-scale. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this NIA are A-weighted. Table 1 provides sound pressure levels of typical noise sources in units of dBA and micropascals (µPa) of pressure.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour or less). The L_{eq} is also the foundation of both the Day-Night Average Level (L_{dn}) and the

Community Noise Equivalent Level (CNEL) noise descriptors described below, each of which has a strong correlation with community response to noise. The maximum sound level (L_{max}) represents the highest instantaneous noise level recorded over a given time period (usually one hour or less), and can also be utilized to assess community noise impacts.

Table 1 Typical A-Weighted Sound Levels of Common Noise Sources

Loudness Ratio	Micropascals (µPa)	dBA	Description
128	63,245,553	130	Threshold of Pain
64	20,000,000	120	Jet aircraft Take-Off at 100-feet
32	6,324,555	110	Riveting Machine at Operator's Position
16	2,000,000	100	Shotgun at 200-feet
8	632,456	90	Bulldozer at 50-feet
4	200,000	80	Diesel Locomotive at 300-feet
2	63,246	70	Commercial Jet Aircraft Interior During Flight
1	20,000	60	Normal Conversation Speech at 5- to 10-feet
0.5	6,325	50	Open Office Background Level
0.25	2,000	40	Background Level Within a Residence
0.125	632	30	Soft Whisper at 2-feet
0.0625	200	20	Interior of Recording Studio

Sources: (US EPA, 1971) and (Federal Interagency Committee on Noise, 1992).

The Day-Night Average Level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to smooth out short-term variations in the noise environment. L_{dn} based noise standards are commonly used to assess noise impacts associated with variable noise sources, such as traffic, railroad and aircraft noise. The L_{dn} noise metric forms the basis of the applicable Tulare County General Plan noise criteria described in Section 3.1.6 below.

CNEL is also based upon the average noise level over a 24-hour day, with a +5 decibel weighing applied to noise occurring during evening (7:00 p.m. to 10:00 p.m.) hours and a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. These additions are made to account for the noise sensitive time periods during the evening and night hours, when people are generally at home and more sensitive to sound.

The maximum sound level (L_{max}) presents the highest instantaneous noise level recorded over a given time period (usually one hour or less). This value is useful as it can reveal short-term, intermittent noise sources (e.g., railroads, aircraft noise) within a noise environment, which would be lost with L_{dn} and CNEL noise descriptors.

3.1.3 Characteristics of Groundborne Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through a structure. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration depends on their individual sensitivity as well as the amplitude and frequency of the source. Additionally, damage to structures can occur when exposed to groundborne vibration.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (inches/second). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity. Although aggregate mining and processing vibration levels are not expected to be significant for this Project due to the relatively large distances between Project equipment (sources) and acoustically sensitive receivers, and the fact that no blasting would occur with this Project, an assessment of mining-related vibration levels is nonetheless addressed.

According to Caltran's *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage (e.g., crack plaster). Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. Traffic, including heavy trucks traveling on a highway, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate by a few ten-thousandths to a few thousandths of an inch. Differences in subsurface geologic conditions and distance from the source of vibration would result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes would decrease with increasing distance. The maximum rate or velocity of particle movement is the commonly accepted descriptor of the vibration "strength." This is referred to as the peak particle velocity (PPV) and is typically measured in inches per second.

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 2 displays the human response to transient vibration sources (i.e., mining equipment) in terms of particle velocity (PPV) vibration levels.

Table 2 General Human Responses to Transient Vibration Levels

Human Response to Vibration	Peak Vibration Threshold (in./sec. PPV)
Severe	2.0
Strongly perceptible	0.9
Distinctly perceptible	0.24
Barely perceptible	0.035

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020).

3.1.4 Federal Standards

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972 (42 U.S.C. §4901 et seq.), which serves three purposes:

- Establish noise emission standards for interstate commerce.
- Assist state and local abatement efforts.
- Promote noise education and research.

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies, including the Federal Aviation Administration (FAA), Federal Transit Administration (FTA), and Federal Highway Administration (FHWA).

The FAA regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the FTA (formerly the Urban Mass Transit Administration). Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the FHWA. Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the counties and cities are restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.1.5 State Standards

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regulatory tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. This land use compatibility matrix is also referenced within the Tulare County General Plan, specifically under Policy HS-8.6, and presented in Figure 4 (Appendix A).

Article 4 of the California Administrative Code (California Noise Insulation Standards, Title 24, Chapter 1) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family

detached housing) that prevent interior Day-Night (L_{dn}) or CNEL noise levels from exceeding 45 dBA. When such structures are located within a 60-dBA Day-Night (L_{dn}) or CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA limit. These state-designated noise level limits are consistent with the criteria outlined in the Tulare County General Plan (see Section 3.1.6 below).

Government Code §65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

The *Tulare County General Plan – 2030 Update* has an adopted noise element (Chapter 10 – Health and Safety, Section 10.8 – Noise) that outlines various guidelines and requirements related to noise. As discussed above, the Tulare County Code (Tulare County, 2020) does not contain a specific noise ordinance nor does it set specific restrictions related to noise.

3.1.6 County General Plan Noise Policies & Guidelines

The *Tulare County General Plan – 2030 Update*, Noise Element (Section 10.8) has a number of policies related to noise (Tulare County, 2012). General Plan noise policies that apply to the Project are listed below. Please note, the General Plan defines "noise sensitive land use(s)/receptors" to include "residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses" (Tulare County General Plan, Section 10 – Health and Safety).

HS-8.2 Noise Impact Areas
The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB Ldn (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.

HS-8.3 Noise Sensitive Land Uses
The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB Ldn (or CNEL) or less within outdoor activity areas and 45 dB Ldn (or CNEL) or less within interior living spaces.

HS-8.4 Airport Noise Contours
The County shall ensure new noise sensitive land uses are located outside the 60 CNEL contour of all public use airports.

HS-8.6 Noise Level Criteria
The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).

Table 10.1: Land Use Compatibility for Community Noise Environments [*see Figure 4, Appendix A*], is provided as a reference concerning the sensitivity of different land uses to their noise environment. It is intended to illustrate the range of noise levels which will allow the full range of activities normally associated with a given land use.

HS-8.7 Inside Noise
The County shall ensure that in instances where the windows and doors must remain closed to achieve the required inside acoustical isolation, mechanical ventilation or air conditioning is provided.

HS-8.8 Adjacent Uses
The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB Ldn (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.

HS-8.11 Peak Noise Generators
The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

HS-8.13 Noise Analysis
The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 [*Figure 4, Appendix A*] of the Health and Safety Element).

HS-8.14 Sound Attenuation Features
The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.

HS-8.15 Noise Buffering
The County shall require noise buffering or insulation in new development along major streets, highways, and railroad tracks.

HS-8.18 Construction Noise
The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7 pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 Construction Noise Control
The County shall ensure that construction contractors implement best practices guidelines (i.e. berms, screens, etc.) as appropriate and feasible to reduce construction-related noise impacts on surrounding land uses.

3.1.7 Lemon Grove Community Plan – Noise & Vibration Ordinances

Although the Project site is located within unincorporated Tulare County, nearby receptors are located within the Urban Development Boundary (UDB) of the County's *Lemon Grove Community Plan 2019*

(Tulare County, 2019). The Tulare County *Lemon Cove Community Plan 2019* has a number of policies related to noise. The Lemon Cove Community Plan policies, not already listed in the Tulare County *Tulare County General Plan – 2030 Update* (see Section 3.1.6 above), that apply to the Project are listed below.

Goal 2 **Prevent Incompatible Uses Provide designated routes and loading standards that reduce the noise and safety concerns associated with truck traffic.**

Policies and Standards

1. Designate truck routes for use by heavy commercial and industrial traffic. Initially, designated truck routes shall be:
    - State Route 198
2. Design interior street systems for commercial and industrial subdivisions to accommodate the movement of heavy trucks.
3. Restrict heavy duty truck through-traffic in residential areas and plan land uses so that trucks do not need to traverse these areas.
4. Design off-street loading facilities for all new commercial and industrial developments so that they do not face surrounding roadways or residential neighborhoods. Truck backing and maneuvering to access loading areas shall not be permitted on the public road system, except when specifically permitted by the County Engineer.

Goal 9 **Design, construct, and operate the transportation system in a manner that maintains a High level of environmental quality.**

Policies and Standards

1. Control dust and mitigate other environmental impacts during all stages of roadway construction.
2. Protect residents from transportation generated noise hazards. Increased setbacks, walls, landscaped berms, other sound absorbing barriers, or a combination thereof shall be provided along four lane highways in order to protect adjacent noise-sensitive land uses from traffic generated noise impacts. Additionally, noise generators such as commercial, manufacturing, and/or industrial activities shall use these techniques to mitigate exterior noise levels to no more than 60 decibels.
3. Review and monitor proposals for expansion of pipelines for the transport of suitable products and materials, and require mitigation of environmental impacts.
4. Encourage the use of non-polluting vehicles for both public and private uses.
5. Include noise mitigation measures in the design of roadway projects in Lemon Cove.

3.1.8 Vibration Criteria

Tulare County does not have any specific ordinances, policies, criteria or restriction related to groundborne vibration. However, the California Department of Transportation (Caltrans) has developed a set of criteria to assess the potential impacts caused by vibration-generating activities. Table 3 outlines threshold criteria for Project-related vibration impacts on nearby human populations, based on test subjects' responses to transient vibrations in terms of peak particle velocity (PPV) in units of inches per second (in/sec). These criteria form the basis of the groundborne vibration impact analysis in Section 6.1.2.

Table 3 Human Responses to Transient Vibration

PPV (inches/second)	Human Response
2.0	Severe
0.9	Strongly perceptible
0.24	Distinctly perceptible
0.035	Barely perceptible

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020).

3.1.9 CEQA Guidelines

The CEQA Guidelines provide threshold criteria that can be used to determine whether a project would result in a significant impact to the environment. These criteria are found in the Environmental Checklist in Appendix G of the CEQA Guidelines. Section 13 of the Environmental Checklist outlines criteria for noise and vibration analysis, and these specific criteria form the basis of the significance thresholds utilized to determine Project impacts. These thresholds are used in this study to determine potential impacts associated with the Project and are discussed further in Section 4.0.

3.2 Environmental Setting

This section describes the noise environment and existing noise sources in and around the Project site, the receptors of concern near the Project site, as well as the ambient noise levels in these areas. For this Project, the local setting and ambient noise levels includes nearby existing mining operations (e.g., Seaborn facility, CEMEX Lemon Cove facility, Kaweah South site, etc.) in the vicinity of the Project site (see Figure 2, Appendix A).

3.2.1 Regional Setting

As discussed previously, the Project site is located in a semi-rural area of unincorporated Tulare County, California, north of the community of Lemon Cove. The existing ambient noise environment experienced by residential receptors closest to the Project site is consistent with that of typical rural areas and consists primarily of natural sounds (wind, birds, insects, etc.), local roadway traffic (e.g., SR-228/Lomitas Drive, SR-198/Sierra Drive, etc.), occasional aircraft over-flights, aggregates mining and processing, and agricultural operations/equipment. Nearby urban centers include the census-designated community of Lemon Cove (1.0 miles to the southeast) and the City of Woodlake (2.5 miles to the northwest); however, urban activities from these nearby communities are generally not audible at the Project site. The closest airports/airstrips are the Woodlake Airport, located approximately 2.4 miles away to the west, and the Exeter Airport, located approximately 11.3 miles away to the southwest. Neither airport has an appreciable influence on noise levels near the Project site, and the site is not located within planning areas and/or designated noise contour areas associated with these airports. Please see Figure 1, Figure 2 and Figure 6 (Appendix A) which show the regional Project setting and the locations of nearby Project site receptors.

3.2.2 Local Vibration Environment

The existing ambient vibration environment in the immediate Project vicinity is extremely low, as would be expected in typical environments with no local sources of vibration. During field visits, Sespe staff could not detect any appreciable groundborne vibrations resulting from adjacent land uses, including the nearby aggregate and agricultural operations. Background vibration levels around the Project perimeter are less

than the threshold of perception.

3.2.3 Local Noise Environment

As discussed above, the existing ambient noise environment is consistent with that of typical semi-rural areas. To quantify the existing ambient (i.e., baseline) noise environment experienced by neighboring receptors closest to the Project site, a total of sixteen (16) short-duration (15-minute) measurements and one (1) long-duration (24-hour) reference noise measurement were collected at ten (10) locations surrounding the Project site on October 21st and 22nd, 2020 (Figure 6, Appendix A). The noise measurements were recorded using two (2) Quest DL SoundPro, Type 2 noise meters (Serial #'s BGI04008, BIJ090010). Noise meters were programmed in "slow" mode, in "A" weighted form, and logging every minute. The microphones were equipped with a windscreen during measurements, and noise meters were calibrated using two (2) Quest QC-10 calibrators (Serial #'s QIB070141, QIJ090052) prior to, and following each, measurement taken. The noise meters and calibrators were calibrated by Engineering Dynamics, Inc., who provided Certificates of Compliance and Calibration for each piece of equipment (Appendix I).

As discussed in Section 3.1.6, noise sensitive land uses (i.e., receptors) are defined as "residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses" within the Tulare County General Plan (Tulare County, 2012). Per the County noise standards and General Plan criteria, noise impacts to nearby commercial and industrial receptors, specifically the existing Seaborn and CEMEX Lemon Cove aggregate facilities, are not assessed within this NIA. The locations of the baseline noise measurement locations and the corresponding Project site receptors are shown on Figure 6 (Appendix A). The long-duration (i.e., 24-hour) measurement represents both a receptor (R1) and was also utilized as a reference measurement to estimate the Day-Night Average (L_{dn}) noise levels at the other receptor locations where only short-duration measurements were collected. The details of these calculations are presented in Appendix C.

The monitoring locations and associated receptors considered in this NIA are summarized in Table 4. The closest relevant receptor in each direction from the Project site was included. Furthermore, measurements at these closest receptors conservatively account for potentially-affected receptors at locations farther from the Project noise sources. When appropriate, receptors are grouped together and the noise impact at the worst-case portion of the group is determined. See Figure 6 in Appendix A for the locations of the Project site receptors respectively.

Table 4 Summary of Monitoring Locations

Receptor	Duration	Date(s) Measured	Time Start	Time Stop	Description
R1	24-hours	10/21/20 10/22/20	1:29 p.m. ---	--- 1:29 p.m.	Residence owned by TID, south of Project Site.
R2	30-mins	10/21/20 10/22/20	5:29 p.m. 10:52 a.m.	5:44 p.m. 11:07 a.m.	Residence southwest of Project site, along Road 228.
R3	30-mins	10/21/20 10/22/20	5:08 p.m. 11:18 a.m.	5:23 p.m. 11:33 a.m.	Residence southeast of Project site, along Goodale Lane.
R4	30-mins	10/21/20 10/22/20	4:42 p.m. 11:18 a.m.	4:57 p.m. 11:33 a.m.	Residence(s) east of Project site, adjacent to SR-198.

Receptor	Duration	Date(s) Measured	Time Start	Time Stop	Description
R5	30-mins	10/21/20 10/22/20	3:27 p.m. 12:06 p.m.	3:42 p.m. 12:21 p.m.	Residence north/northeast of Project site, along a private dirt road connecting to SR-216.
R6	30-mins	10/21/20 10/22/20	3:27 p.m. 12:06 p.m.	3:42 p.m. 12:21 p.m.	Residence north of Project site, along a private dirt road connecting to SR-216.
R7	30-mins	10/21/20 10/22/20	3:03 p.m. 12:29 p.m.	3:18 p.m. 12:44 p.m.	Residence north of Project site, along a private dirt road connecting to SR-216.
R8	30-mins	10/21/20 10/22/20	2:43 p.m. 12:53 p.m.	2:58 p.m. 1:08 p.m.	Residence northwest of Project site, along Road 228.
R9	30-mins	10/21/20 10/22/20	5:50 p.m. 1:14 p.m.	6:05 p.m. 1:29 p.m.	Residence(s) west of Project site, along Avenue 335 west of the Seaborn facility.
R10	30-mins	10/21/20 10/22/20	10:25 a.m. 1:34 p.m.	10:40 a.m. 1:49 p.m.	Residence west of Project site, along Avenue 332.

Figure 6 (Appendix A) shows the locations described above.

Based on ambient noise measurements taken October 21st and 22nd, 2020, Table 5 presents the existing ambient noise levels experienced at the receptors in the Project site vicinity. Noise from the existing adjacent aggregate operations were captured in these ambient noise levels as the sites were operating while the measurements were taken. Noise measurement logs and additional information regarding the background noise level determination are included in Appendix C. Project site monitoring locations are illustrated on Figure 6 (Appendix A).

Long-term (i.e., 24-hour) measurements consist of daytime, evening and nighttime hours, and reveal average L_{dn}, CNEL, and L_{eq} noise levels. One (1) long-term measurement was collected at Receptor 1 (R1), which is a residence that is owned and rented out by the TID. This receptor is in close proximity to the Project site (approximately 250-feet to the south) but far away from any non-Project related intermittent or high-intensity noise sources (i.e., roads, agricultural and mining operations, etc.), making it generally representative of existing ambient conditions near the Project site. The average hour L_{eq} value from long-term measurements during the applicable measurement periods, as well as the 24-hour L_{dn} and CNEL are presented below in Table 5.

To estimate average Day-Night (L_{dn}) noise levels for receptors where only short-duration (i.e., 15-minute) measurements were collected (i.e., R2 through R10), L_{eq} measurements collected at the long-duration (24-hour) reference location were compared to L_{eq} measurements at each short-duration receptor location(s) during the same time of day to determine the dBA difference between the two points. For example, Receptor R7 measurements (2 measurements, 15 minutes each) collected between 3:03 p.m. and 3:18 p.m. on 10/21/2020 and 12:29 p.m. and 12:44 p.m. on 10/22/2020, when compared to the L_{eq} values collected at the 24-hour reference point during the same time periods show an average noise level difference of +8.0 dBA and +1.8 dBA respectively (average noise difference equates to +4.9 dBA). This difference between the noise levels can be used as a correction factor, which is utilized to estimate the Day-Night (L_{dn}) and CNEL noise levels at Receptors 2 (R2) through 10 (R10). Additional details regarding these calculations are included in Appendix C.

Using this concept, Table 5 and shows the ambient noise levels (L_{eq}, L_{dn} and CNEL) at each receptor. As discussed above, the L_{eq} noise levels represent the measured ambient noise levels at each receptor. While the L_{dn} and CNEL levels at Receptor R1 were measured over a 24-hour period, the L_{dn} and CNEL levels at the remaining receptors were estimated using the appropriate adjustment factors. The nearest noise sensitive receptor to the Project in each direction is included in this assessment. Please see Appendix C which provides more detail regarding ambient noise level measurements and determination.

Table 5 Ambient Noise in Project Site Vicinity (dBA)

Receptor	L_{eq} [A]	Day-Night (L_{dn}) Average [B]
R1	43.8	47.6
R2	44.6	55.9
R3	50.2	59.8
R4	37.8	44.7
R5	56.5	66.2
R6	47.0	53.5
R7	46.3	60.8
R8	41.1	54.3
R9	47.0	47.8
R10	43.8	47.6

Footnotes:

A – L_{eq} values shown represent exterior noise levels at these locations. See Appendix C for more detail.

B – Day-Night (L_{dn}) noise levels at R2 through R10 were calculated by comparing measured daytime values at each of these locations to the measured noise level at the 24-hour reference location during the identical time period. The difference between these values (i.e., correction factor) is then applied to the applicable 24-hour L_{dn} measurements to estimate the appropriate noise levels at each receptor location. Please see Appendix C for more detail.

4.0 SIGNIFICANCE THRESHOLDS

According to the Appendix G Checklist in the CEQA Guidelines (CCR, Title 14, Division 6, Chapter 3, §15000 – 15387), a Project would have a significant effect if any of the following are true:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (see Sections 6.1.1).

b) Generation of excessive groundborne vibration or groundborne noise levels (see Section 6.1.2).

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels (see Section 6.1.3).

4.1 Tulare County Noise Regulations

As described in Section 3.1.6, Tulare County has adopted various guidelines, requirements and policies related to noise in their General Plan. Tulare County does not have any specific development codes or zoning ordinances related to noise; therefore, the County General Plan criteria represent the only applicable noise thresholds by which Project impacts can be compared. The Tulare County noise thresholds are utilized to address CEQA Checklist item *a)*.

Table 6 presents the applicable unadjusted Project noise thresholds, which are derived from the Tulare County General Plan regulatory standards presented in Section 3.1.6 above.

Table 6 Unadjusted Tulare County Noise Standards

Parameter/Description	Day-Night (L_{dn}) or CNEL Average Noise Limit
Policy HS-8.8: Noise level not to be exceeded at the boundary of areas designated and zoned for residential or other noise-sensitive uses as a result of the Project activities.	60 dB(A)

Source: *Tulare County General Plan – 2030 Update*, Section 10.8 – Noise Element (Tulare County, 2012).

Although not specified within the Tulare County General Plan, generally in cases where the existing ambient noise levels exceed the applicable standards, then the noise level standard would be increased at +3 dBA increments to encompass the ambient noise. This concept corresponds with the concept that a +3 dBA increase or decrease is generally accepted as the minimum perceptible change in noise. Additionally, if ambient noise levels are within ±1 dBA of the applicable significance threshold, the applicable County noise level standards are increased by +3 dBA increments to encompass the ambient (e.g., ambient level of 59.3 dB results in a significance threshold of 62.3 dB rather than 60 dB). Table 7 below presents the applicable Tulare County significance thresholds for each receptor, adjusted as needed to encompass the ambient noise levels presented in Table 5. These noise thresholds are utilized to address CEQA Checklist item *a)* in Section 6.1.1 below. Additional detail regarding these calculations is included in Appendix C.

Table 7 Applicable Tulare County Noise Standards

Receptor	Measured Ambient Noise Level (L_{dn})	Tulare County General Plan Threshold	Adjusted Threshold to Account for Ambient
R1	47.6	60	---
R2	51.7	60	---
R3	59.3	60	62.3
R4	44.7	60	---
R5	57.4	60	60.4
R6	57.4	60	60.4
R7	52.5	60	---
R8	56.0	60	---
R9	51.8	60	---
R10	47.8	60	---

Note: See the calculations/footnotes within Appendix C for more details

4.2 Vibration Significance Thresholds

As discussed in Section 3.1.8, Tulare County does not have any specific standards or criteria related to vibration. Therefore, the Caltrans vibration criteria presented in Section 3.1.8 and Table 3 is utilized to determine the significance of Project vibration impacts. Specifically, the peak particle velocity (PPV) of 0.24 inches per second (in/sec) presented in Table 3, which is considered a "distinctly perceptible" vibration level, is utilized to determine the significance of Project vibration impacts per CEQA Checklist item *b)*.

5.0 METHODOLOGIES

To quantify the noise generated by the Project noise sources (i.e., excavation, construction and reservoir maintenance equipment/structures) reference data was gathered from the Federal Highway Administration's (FHWA) *Roadway Construction Noise Model User Guide* (Federal Highway Administration, 2006) and other relevant sources. The following sections summarize the methodologies, assumptions and reference noise levels utilized in the analyses of each Project phase: 1) Reservoir Excavation; 2) Reservoir Facility Construction; and, 3) Reservoir Operations. Also see Appendix D for more detail.

5.1 Reservoir Excavation

To determine the appropriate sound pressure levels generated during reservoir excavation activities, various noise reference data was utilized. Per information provided by TID and WCA, mobile equipment (e.g., loaders, excavators, haul trucks, etc.) will operate onsite during the reservoir excavation phase to mine and transport material. Mobile equipment source noise average (L_{eq}) and maximum (L_{max}) sound pressure levels were determined using FHWA reference data. Appendix D summarizes the FHWA source noise data utilized to quantify mobile equipment noise levels during reservoir excavation.

In addition to mobile equipment, an aggregate screen/wash plant and, as needed, a mobile crushing/recycle plant (referred to as the processing plants) would also operate onsite during reservoir excavation. Noise levels associated with these plants are based on field measurements collected by Sespe Consulting, Inc. in 2020 from a comparable processing and recycling operation in Otay Mesa, California. In addition to these plants, other ancillary equipment, specifically haul trucks and loaders, were also operating nearby simultaneously when these measurements were collected at the Otay Mesa facility. Therefore, the measured noise levels represent a conservative overestimation of the noise generated by the Project's aggregate screen/wash plant and crush/recycle plant. Appendix D contains additional detail and relevant references for the processing plant noise sources.

Table 8 shows the type and quantity of equipment that would be utilized onsite during the reservoir excavation phase. Usage fraction (%) and maximum sound pressure level (L_{max}) noise data shown for mobile sources are FHWA default values. Source noise calculations in Appendix D provide additional detail.

Table 8 Reservoir Excavation – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders (x4)	80	40%	76
Excavator	85	40%	81
Haul Trucks (x2)	84	40%	80
Water Truck	84	40%	80
Processing Plant(s) Sources			
Aggregate Plant	---	---	84.1
Crushing/Recycle Plant	---	---	84.1

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006) and Otay Mesa Noise Study (Sespe Consulting, 2020). See Appendix D for more detail.

Per information provided by WCA, reservoir excavation activities will be limited to Monday through Saturday, between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier). Because the County criteria applies to noise impacts over a 24-hour period (i.e., Day-Night [L_{dn}] noise levels), it was assumed that the onsite equipment summarized in Table 8 would operate simultaneously for up to 14-hours in a given day. Additionally, it was conservatively assumed that the equipment would operate at-grade in the onsite locations in closest proximity to each receptor (see Figure 6, Appendix A).

5.1.1 Noise Attenuation due to Excavation Pit Walls

To determined worst-case noise impacts during the initial Project construction phase, it is assumed that the excavation and processing equipment summarized in Table 8 would operate simultaneously at-grade in the onsite location closest to each affected receptor (see Figure 6, Appendix A). Therefore, shielding and noise attenuation due to distance and intervening topography was conservatively not accounted for in the impact calculations. In reality, as the excavation progresses, it's expected that most of the mobile and processing equipment would operate within the pit, which would eventually block line-of-sight between equipment and nearby receptors.

As the excavation pit deepens, significant noise attenuation will be provided by the pit walls as they would sufficiently break line-of-sight between Project excavation noise sources (i.e., mobile equipment and processing plant[s]) and nearby residential receptors. Barrier insertion loss calculations presented in Appendix E show that once reservoir excavation operations reach a depth of 16-feet bgs, assuming equipment is operating within the bottom of the pit, noise levels experienced at nearby receptors would be significantly attenuated (estimated to be a minimum -14.0 dBA reduction at Receptor 1 [R1]). Please see the discussion in Section 6.1.1 below and the calculations in Appendix E for additional detail.

5.2 Reservoir Construction

Once the pit is fully excavated and the basin/slopes stabilized, construction of the reservoir will commence. Specifically, this Project phase will involve construction of the inflow/outflow channels and chutes, installation of the electrically operated weirs and energy dissipation pools, completion of the slurry wall, and installation of other ancillary structures (e.g., perimeter berm/access road, AST tank and related generator/housing structure, etc.).

Per information provided by TID, Table 9 summarizes mobile equipment that will operate onsite during this Project phase. As with excavation, construction of the reservoir is estimated to occur between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier). Although much of the reservoir construction activities are expected occur below-grade within the excavation pit, conservatively it is assumed that the equipment presented in Table 9 would operate simultaneously, at-grade in the onsite locations in closest proximity to each receptor (see Figure 6, Appendix A). See Appendix F for the source noise calculations.

Table 9 Reservoir Construction – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders	80	40%	76
Excavator	85	40%	81

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Backhoe	80	40%	76
Grader	85	40%	81
Trencher	80	40%	76
Compactor	80	20%	73
Crane	85	16%	77
Cement Truck	85	40%	81
Water Truck	84	40%	80
Generator	82	50%	79
Pumps	77	50%	74

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006). See Appendix F for more detail.

5.3 Reservoir Operations

Once the reservoir is constructed and fully operational, the Owners would have daily control over operations and management of the reservoir and related facilities, which would primarily involve the use of the equipment to monitor and control the facility remotely. At times, TID staff would also perform routine onsite inspections to ensure the reservoir is operating properly. During the ongoing operations and maintenance of the reservoir, there would be limited equipment usage. For example, equipment may be needed to perform minor grading of the access road or to remove any debris that collects in the bottom of the reservoir. TID estimates that onsite reservoir maintenance using mobile equipment would occur only a few times per year (approximately 1 to 2 days per year).

Mobile equipment summarized in Table 10 would be used onsite annually for intermittent reservoir maintenance operations. Reservoir operations and maintenance activities would be conducted by TID staff during normal working hours, specifically between the hours of 8:00 a.m. and 5:00 p.m.

Table 10 Reservoir Operations/Maintenance – Reference Equipment Noise Data

Noise Source	L_{max} @ 50-feet (dBA)	Usage (%)	L_{eq} @ 50-feet (dBA)
Mobile Equipment Sources			
Loaders	80	40%	76
Grader	85	40%	81
Dump Truck	84	40%	80
Generator	82	50%	79

Equipment Sources: Federal Highway Administration (Federal Highway Administration, 2006). See Appendix G for more detail.

5.4 Project Design Features that Reduce Noise

Consistent with Tulare County General Plan Policies outlined in Section 3.1.6, Numerous design features, best management practices (BMPs), operating practices and other environmental protection measures have been incorporated into the Project to minimize potential impacts on the environment. The environmental protective measures that were considered during this evaluation include, but are not limited to, the following.

1. Blasting would not be used for the proposed operations.

2. No excavation of material would take place within thirty (30) to fifty (50) feet from adjacent property lines (see Figure 3, Appendix A).
3. The processing of aggregate at the Project site has been designed not to exceed the production rates historically achieved at the Seaborn site.

As discussed previously, due to design feature Number 3 listed above, the number of haul trucks and employee vehicles on public roadways would not increase above existing levels as a result of the Project. Therefore, noise impacts resulting transportation sources are not analyzed in this NIA.

6.0 PROJECT-LEVEL IMPACTS & MITIGATION MEASURES

6.1 Impact Assessment

6.1.1 Generation of Noise Levels in Excess of Applicable Standards

Impact Statement

Impact NO-1: *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?* **(Appendix G Threshold Criteria (a))**

Impact Analysis

To address the CEQA Criteria *a)*, the applicable Tulare County General Plan criteria presented in Section 4.1 (also see Table 6 and Table 7) is utilized. The following sections summarize the Project noise impacts determined for each individual Project phase: 1) Reservoir Excavation; 2) Reservoir Facility Construction; and, 3) Reservoir Operations. The predicted change in noise level experience at each receptor as result of Project is quantified and compared to the applicable Tulare County thresholds to determine the significance of Project impacts. Where Project noise levels exceed applicable thresholds, feasible mitigation measures are proposed. Also see the detailed methodology discussion in Section 5.0 and the calculations in Appendices D through G for additional background.

Reservoir Excavation

Table 11 below shows the predicted change in Day-Night (L_{dn}) noise level estimated at each receptor as a result of reservoir excavation operations. As discussed in Section 5.1, it is assumed that the excavation and processing equipment summarized in Table 8 would operate simultaneously at-grade in the onsite location closest to each affected receptor (see Figure 6, Appendix A) to determined worst-case noise impacts during this initial Project phase.

As shown in Table 11 below, worst-case, unmitigated noise levels during reservoir excavation exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptors R1, R5 and R6. The calculations in Appendix D provide additional detail. It is also important to note that these exceedances associated with the reservoir excavation operations are expected to be short-term and temporary in nature. Over time, as the excavation pit proceeds to a final depth of approximately 60-feet bgs, equipment noise would be increasingly shielded due to the attenuation provided by the deepening pit walls. Please see Appendix E, which presents calculations and details (e.g., receptor/equipment heights, noise transmission paths, etc.) relating to estimate noise attenuation provided by the excavation pit walls.

Table 11 Reservoir Excavation – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	73.4	60	**Yes**	+13.4
R2	4,978	55.3	60	No	---
R3	3,980	60.6	62.3	No	---
R4	4,190	54.7	60	No	---
R5	2,560	61.0	60.4	**Yes**	+0.6
R6	2,539	61.1	60.4	**Yes**	+0.7

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R7	2,382	60.0	60	No	---
R8	3,262	59.3	60	No	---
R9	4,251	56.1	60	No	---
R10	3,891	55.7	60	No	---

Note: Values shown in **bold** represent a potentially significant impact. See Appendix D for more detail.

Referring to Table 11, noise levels during the Project reservoir excavation phase do not exceed the applicable County noise standards except at Receptors 1 (R1), 5 (R5) and 6 (R6). Please see the mitigation measures presented below.

Level of Significance Before Mitigation

Potentially significant.

Mitigation Measures

As shown in Table 11, at the initial stages of the excavation phase when mobile and processing equipment would be operating at-grade, noise impacts at Receptors R1, R5 and R6 exceed various County Ldn noise standards. As discussed in Section 5.1.1, at an approximate depth of 16-feet bgs, an estimated -16.3 dBA of noise attenuation would result at Receptor 1 (R1). Similar reductions would also be expected at the receptors. Therefore, once reservoir excavation reaches this depth (i.e., 16-feet bgs or lower), and the processing plants are relocated into the pit, Project noise levels would be less than the applicable Tulare County criteria at every receptor, and no additional mitigation measures would be required.

Nevertheless, to ensure noise levels do not exceed these applicable threshold criteria during Project's reservoir excavation operations occurring at 16-feet bgs or higher, control measures sufficient to obtain noise reductions ranging from -13.4 dBA's (i.e., L_{dn} at R1) to -0.6/-0.7 dBA's (L_{dn} at R5 and R6) would need to be implemented. The following discusses potential control measures:

- Because the Tulare County Day-Night (L_{dn}) noise criteria averages noise impacts over an adjusted 24-hour period, Project noise levels can also be controlled by limiting daily operational hours. This is especially true when prohibiting operations between the hours of 10:00 p.m. and 7:00 a.m., as the L_{dn} threshold adds a +10 dBA penalty to Project noise levels generating during those hours.
- As discussed above, the residence located at Receptor 1 (R1) is owned by TID and leased out periodically to tenants. Therefore, TID has the ability to control the occupancy of R1, set the terms of lease agreements, and inform the current occupants of any temporary noise impacts resulting from the Project.

Until the reservoir excavation operations reach a depth of 16-feet bgs and the processing plants are relocated, mitigation measures are required to ensure Project noise levels comply with the applicable Tulare County criteria. As discussed above, one such method would be restricting the operational hours when noise generating activities are occurring. Specifically, if at-grade onsite processing (i.e., screen/wash plant and crush/recycle plant) operations were prohibited between the hours of 4:00 a.m. and 7:00 a.m., noise impacts at affected receptors would be reduced. Table 12 presents the predicted Day-Night (L_{dn}) noise level experienced at each receptor, assuming processing operations were prohibited between the hours of 4:00 a.m. and 7:00 a.m. As discussed above, once excavation reaches a minimum depth of 16-

feet bgs and the processing plants are relocated, the processing operations would not be restricted during these hours.

> ***Mitigation Measure NO-1:*** *Onsite material processing operations occurring at a depth of 16-feet below ground surface or higher shall be prohibited between the hours of 4:00 a.m. and 7:00 a.m.*

Table 12 Reservoir Excavation – Limited Processing Hours of Operation

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?
R1	465	**71.6**	**60**	**Yes**
R2	4,978	51.0	60	No
R3	3,980	53.1	62.3	No
R4	4,190	52.5	60	No
R5	2,560	56.7	60.4	No
R6	2,539	56.8	60.4	No
R7	2,382	57.4	60	No
R8	3,262	54.6	60	No
R9	4,251	52.3	60	No
R10	3,891	53.1	60	No

Note: Values shown in **bold** represent a potentially significant impact. See Appendix E for more detail.

As shown in Table 12, even with at-grade onsite processing operations prohibited between the hours of 4:00 a.m. and 7:00 a.m., estimated noise levels experienced at Receptor 1 (R1) still exceed the applicable County L_{dn} threshold by +11.6 dBA's. Therefore, in addition to the provisions outlined above, the following mitigation specific to Receptor 1 (R1) is also proposed. As discussed previously, TID owns and leases the residential receptor located at R1. As with Mitigation Measure NO-1 described above, this additional measure is only necessary if excavation/noise-generating operations are occurring at a depth of 16-feet bgs or higher.

> ***Mitigation Measure NO-2:*** *In order to reduce the noise level at Receptor 1 (R1) to less than the significance threshold, TID must utilize one of the following measures. This mitigation measure can be ceased and no further mitigation will be required, if noise generated equipment operates within the bottom of the excavation pit at a minimum depth of 16-feet below ground surface:*
>
> - *Vacate the residence located at Receptor R1 during reservoir excavation activities; or*
> - *Inform the occupant of Receptor R1 that temporary elevated noise levels may result during initial reservoir excavation activities, and obtain a signed waiver from the tenant indicating that they choose to remain in the house despite the temporary increase in noise levels.*

Through the implementation of Mitigation Measures NO-1 or NO-2, or a combination thereof, reservoir excavation noise sources are expected to have a less than significant impact at nearby receptors with mitigation incorporated.

It is also important to note this analysis was designed to estimate conservative worst-case Project noise impacts at nearby receptors. In reality, when taking into account the shielding or absorption effects from intervening topography/vegetation between source and receptor, as well as the fact that most excavation

and processing operations will not occur simultaneously, near the outermost Project site boundary or within direct line-of-sight of affected receptors (as was assumed in this analysis), noise levels are expected to be less than those calculated within this DEIR. Furthermore, as excavation progresses to a final depth of 60-feet bgs and the pit walls deepen, additional noise attenuation can be assumed.

Level of Significance After Mitigation

Upon implementation of Project design features described in Section 5.4 and adherence to the requirements outlined Mitigation Measure NO-1 and NO-2, Project impacts to nearby receptors during reservoir excavation operations would be **less than significant** with **no additional mitigation required**.

Reservoir Construction

Table 13 below shows the predicted change in Day-Night (L_{dn}) noise level at each receptor during reservoir construction. As with the reservoir excavation analysis, it is conservatively assumed that the reservoir construction equipment summarized in Table 9 would operate simultaneously, at-grade in the onsite location closest to each affected receptor (see Figure 5, Appendix A). Additionally, onsite materials processing, specifically the screen/wash plant and crush/recycle plant, would no longer be required during the reservoir construction phase. As shown in Table 13, worst-case, unmitigated noise levels during onsite reservoir construction activities exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptor R1. Because this residence is owned by TID, as discussed above, implementation of Mitigation Measure NO-2 is sufficient to reduce the potential impact to less than significant. The calculations in Appendix F provide additional detail.

Table 13 Reservoir Construction – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	71.9	60	**Yes**	+11.9
R2	4,978	54.5	60	No	---
R3	3,980	60.3	62.3	No	---
R4	4,190	53.4	60	No	---
R5	2,560	60.2	60.4	No	---
R6	2,539	60.3	60.4	No	---
R7	2,382	58.8	60	No	---
R8	3,262	58.5	60	No	---
R9	4,251	55.2	60	No	---
R10	3,891	54.4	60	No	---

Note: Values shown in **bold** represent a potentially significant impact. See Appendix F for more detail.

Level of Significance Before Mitigation

During the reservoir construction phase, the Project would increase ambient noise levels in excess of applicable County standards at Receptors 1 (R1). Therefore, the Project impacts are considered potentially significant.

Mitigation Measures

Upon implementation of Mitigation Measure NO-2 described above, Project impacts to nearby receptors would be less than significant.

Level of Significance After Mitigation

Upon implementation of Project design features described in Section 5.4 and adherence to the requirements outlined Mitigation Measure NO-2, Project impacts to nearby receptors during reservoir construction operations would be **less than significant** with **no additional mitigation required**.

Reservoir Operations/Maintenance

Table 14 below shows the predicted change in Day-Night (L_{dn}) noise level at each receptor during ongoing reservoir operations/routine maintenance. To determined worst-case noise impacts during this Project phase, it is assumed that maintenance equipment listed in Table 10 would operate at-grade in the onsite location closest to each affected receptor. Although onsite reservoir operations/maintenance activities would be very infrequent (approximately 1 to 2 times per year) and would generally not require the use of mobile equipment, conservatively this analysis assumed that all maintenance equipment listed in Table 10 would operate simultaneously for one full day (i.e., 8:00 a.m. to 5:00 p.m.).

As shown in Table 14, worst-case, unmitigated noise levels during reservoir operations/maintenance exceed the applicable Tulare County Day-Night (L_{dn}) noise thresholds at Receptor R1. As discussed above, Receptor R1 is owned by TID; therefore, implementation of Mitigation Measure NO-2 would be sufficient to reduce the potential impact to less than significant. The calculations in Appendix G provide additional detail.

Table 14 Reservoir Operations – Project Noise Impacts/Tulare County Criteria

Receptor	Distance – Source to Receptor (feet)	Project Noise Levels (L_{dn})	Tulare County Threshold (L_{dn})	Significant?	Level of Exceedance (dBA)
R1	465	61.9	60	**Yes**	+1.9
R2	4,978	52.1	60	No	---
R3	3,980	59.4	62.3	No	---
R4	4,190	46.8	60	No	---
R5	2,560	57.8	60.4	No	---
R6	2,539	57.8	60.4	No	---
R7	2,382	53.7	60	No	---
R8	3,262	56.3	60	No	---
R9	4,251	52.3	60	No	---
R10	3,891	49.1	60	No	---

Note: Values shown in **bold** represent a potentially significant impact.

Level of Significance Before Mitigation

During the reservoir operations/maintenance phase, the Project would temporarily increase ambient noise levels in excess of applicable County standards at Receptor 1 (R1). Therefore, the Project impacts are considered potentially significant.

Mitigation Measures

Upon implementation of Mitigation Measure NO-2 described above, Project impacts to nearby receptors would be less than significant.

Level of Significance After Mitigation

Upon implementation of Project design features described in Section 5.4 and adherence to the requirements outlined Mitigation Measure NO-2, Project impacts to nearby receptors during reservoir operations/maintenance activities would be **less than significant** with **no additional mitigation required**.

6.1.2 Generation of Excessive Groundborne Vibration

Impact Statement

Impact NO-2: *Generation of excessive groundborne vibration or groundborne noise levels?* **(Appendix G Threshold Criteria (b))**

Impact Analysis

The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual* (Federal Transit Administration, 2018) and Caltrans's *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020) documents provide guidelines for assessing vibration impacts resulting from construction activities. Table 15 below lists vibration source levels for common types of construction equipment, in terms of peak particle velocity (PPV) in units of inches per second at a distance of 25-feet.

Table 15 Vibration Source Level for Construction Equipment

Equipment	PPV (in/sec) @ 25-feet away
Vibratory Roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Vibratory Roller	0.210

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020), *Transit Noise and Vibration Impact Assessment Manual* (FTA, 2018).

To assess Project vibration impacts at each receptor location, the reference PPV value of 0.089 inches per second (i.e., large bulldozer) is utilized. It is assumed that nothing larger or more powerful than a large bulldozer would operate at the Project site in close proximity to nearby receptors. The distance shown represents the measured distance from the closest boundary of the Project area to the nearest property boundary of each receptor. Using this information, Table 16 summarizes the predicted groundborne vibration impacts resulting from the Project. Significance was determined by comparing the predicted change in groundborne vibration to the applicable Caltrans vibration threshold outlined in Section 4.2.

Table 16 Predicted Project Vibration Levels at Receptors

Receptors	Distance (feet)	Predicted Vibration – PPV (in/sec) [A]	Applicable San Bernardino County Significance Threshold – PPV (in/sec)	Significant?
R1	465	0.0047	≥ 0.035	No
R2	4,978	0.0003	≥ 0.035	No
R3	3,980	0.0003	≥ 0.035	No
R4	4,190	0.0003	≥ 0.035	No
R5	2,560	0.0006	≥ 0.035	No
R6	2,539	0.0006	≥ 0.035	No
R7	2,382	0.0007	≥ 0.035	No
R8	3,262	0.0005	≥ 0.035	No
R9	4,251	0.0003	≥ 0.035	No
R10	3,891	0.0004	≥ 0.035	No

Note: See Appendix H for more detail.
A – The Project vibration levels shown above are considered "barely perceptible" per Caltrans guidance (Caltrans, 2020).

As shown in Table 16, predicted vibration impacts to nearby receptors were well below the applicable Caltrans significance threshold. It should also be noted that predicted vibration impacts at nearby receptors are considered "barely perceptible" per the Caltrans criteria (see Table 3) for human response to groundbourne vibration (i.e., ≤ 0.035 PPV in/sec). Therefore, groundborne vibration impacts to nearby receptors resulting from Project operations are **less than significant** with **no mitigation required**.

Level of Significance Before Mitigation

Less than significant.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not Applicable.

6.1.3 Airport Land Use/Vicinity Analysis

Impact Statement

Impact NO-3: *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?* **(Appendix G Threshold Criteria (c))**

Impact Analysis

The proposed Project site is not located within 2.0 miles of any private or public airports or airstrips, or in an area governed by an airport land use plan. The closest airport/airstrip is Woodlake Airport, located approximately 2.4 miles west of the Project site. Please see Figure 1 which displays the location of this airport in relation to the Project site. Furthermore, the Project does not involve creation of a new noise-sensitive land uses (i.e., residences). Therefore, the Project would have **no impact** related to

airport/airstrip noise levels.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

None required.

Level of Significance After Mitigation

Not Applicable.

7.0 FINDINGS

This Noise Impact Assessment (NIA) finds that:

- Temporary Project impacts during the reservoir excavation and reservoir construction phases are mitigated to the extent feasible and will comply with applicable Tulare County requirements;
- Noise impacts from ongoing reservoir operations/maintenance activities are less than significant at nearby receptors, except for the TID-owned residence at Receptor 1 where impacts have been mitigated to the extent feasible; and
- Project groundborne vibration impacts are less than significant at nearby receptors.

8.0 REFERENCE

Bollard Acoustical Consultants, Inc. (2005). *Environmental Noise Assessment - Sacramento Aggregates Mining Expansion.* Auburn, CA: Bollard Acoustical Consultants.

California Department of Transportation. (2013). *Technical Noise Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA: California Department of Transportation. Retrieved from https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf

Caltrans. (2020). *Transportation and Construction Vibration Guidance Manual.* California Department of Transportation. Sacramento, CA: California Department of Transportation. Retrieved from https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

EPA. (1974). *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* U.S. Environmental Protection Agency. Washington, D.C. 20460: U.S. EPA. Retrieved 2017

Federal Highway Administration. (2006). *Roadway Construction Noise Model User's Guide.* Washington, DC: U.S. Department of Transportation.

Federal Transit Administration. (2018). *Transit Noise and Vibration Impact Assessment Manual.* Washington, DC: U.S. Department of Transportation. Retrieved from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwiG46Shn7PuAhUB7awKHTH4B5cQFjAAegQIARAC&url=https%3A%2F%2Fwww.transit.dot.gov%2Fsites%2Ffta.dot.gov%2Ffiles%2Fdocs%2Fresearch-innovation%2F118131%2Ftransit-noise-and-vibration-impact

FHWA. (2000). *Noise Barrier Design Handbook.* Federal Highway Administration. Washington D.C.: FHWA.

Norton, M., & Karczub, D. (2003). *Fundementals of Noise and Vibration Analysis for Engineers.* Cambridge, U.K.: Cambridge University Press.

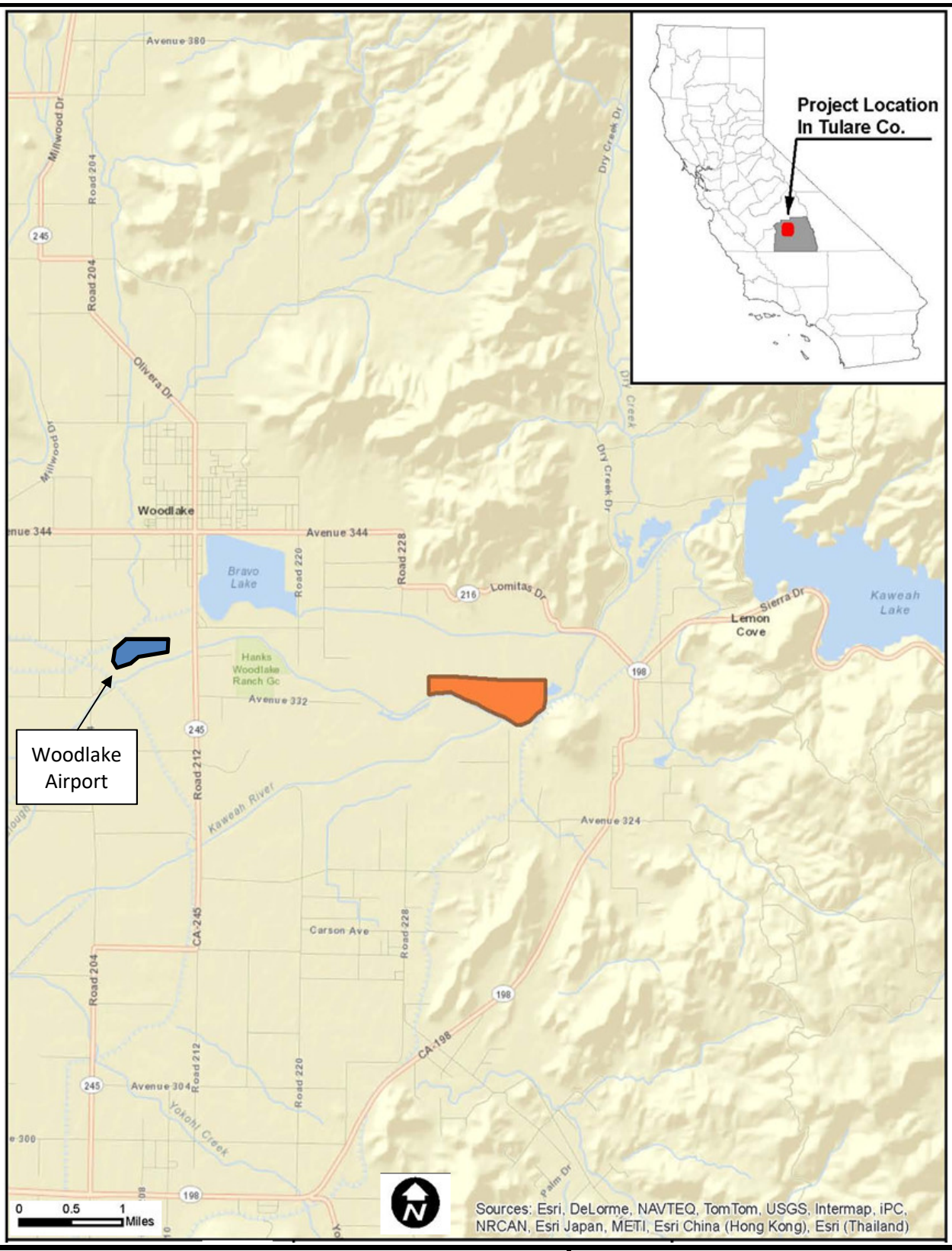
Tulare County. (2012). *Tulare County General Plan - 2030 Update.* Visalia, CA: Tulare County. Retrieved from http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf

Tulare County. (2019). *Lemon Cove Community Plan 2019.* Visalia, CA: Tulare County. Retrieved from http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/120Part%20III%20Community%20Plans%201%20of%207/007LemonCove/GPA%2017-007%20LEMON%20COVE%20COMMUNITY%20PLAN.pdf

Tulare County. (2020). *Tulare County Code.* Visalia, CA: Tulare County. Retrieved from https://www.codepublishing.com/CA/TulareCounty/

APPENDIX A

Figures



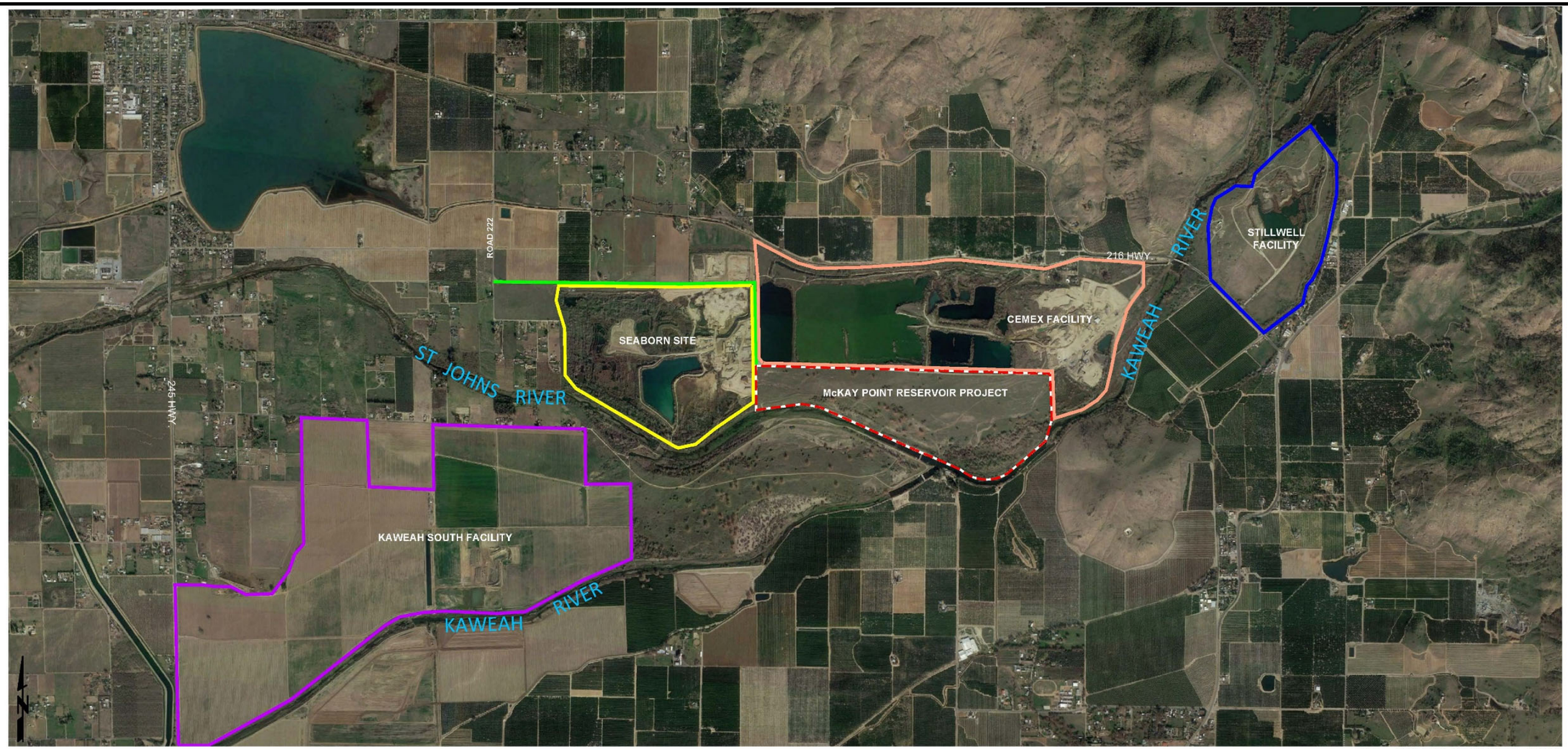
Project Site

N

SESPE CONSULTING, INC.

Source: Provost & Pritchard Consulting Group (2020)

FIGURE 1	REGIONAL LOCATION MAP McKay Point Reservoir Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.11	DATE:	12/4/20
SCALE:	As Shown	DRAWN BY:	P&P



2000 0 2000 4000
SCALE IN FEET

DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/05/2018

LEGEND

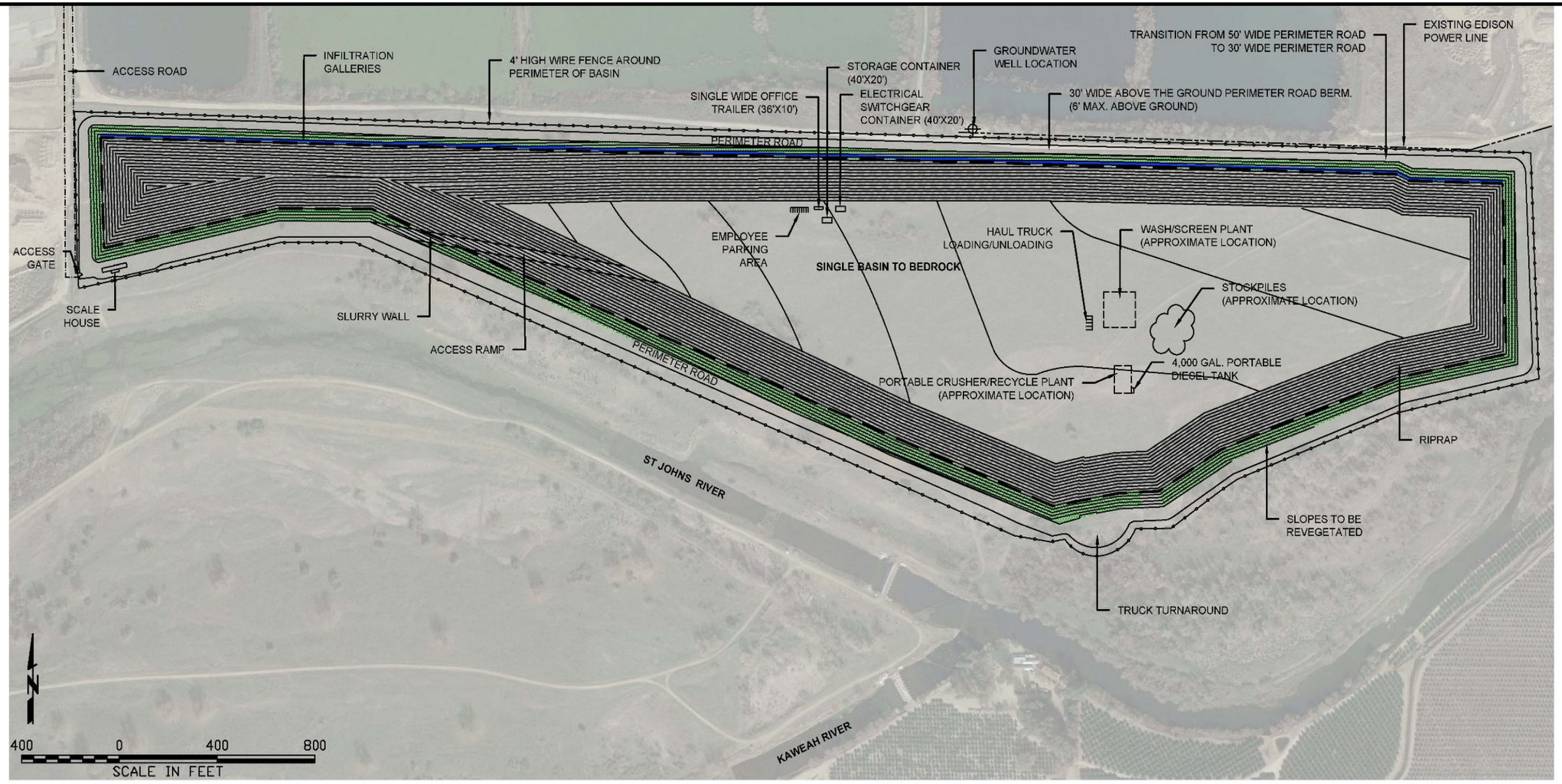
- PROJECT SITE BOUNDARY
- SEABORN SITE
- ACCESS ROAD
- KAWEAH SOUTH FACILITY
- STILLWELL FACILITY
- CEMEX FACILITY

Source: Sespe Consulting, Inc. (2020)

N

SESPE CONSULTING, INC.

FIGURE	VICINITY MAP		
2	McKay Point Reservoir Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.11	DATE:	12/4/20
SCALE:	As Shown	DRAWN BY:	Sespe



NOTES:

a. EXCAVATION PIT WILL HAVE A FINAL DEPTH OF 60-FEET BELOW GROUND SURFACE, WITH A TOTAL SURFACE AREA OF APPROXIMATELY 110 ACRES. PIT SLOPES WILL NOT EXCEED 3H:1V (HORIZONTAL TO VERTICAL).

b. EARLY IN THE EXCAVATION PHASE, A SLURRY WALL WILL BE INSTALLED AROUND THE PERIMETER OF THE PIT TO PREVENT GROUNDWATER INTRUSION.

c. THE LOCATIONS OF THE WASH/SCREEN PLANT, PORTABLE CRUSH/RECYCLE PLANT, AND ASSOCIATED MATERIAL STOCKPILES ARE APPROXIMATE. THESE WILL BE RELOCATED WITHIN THE EXCAVATION AREA AS MINING PROGRESSES.

d. THERE ARE NO EXISTING ONSITE DRAINAGE OR WATER FEATURES THAT WOULD BE DISTURBED BY EXCAVATION/RECLAMATION ACTIVITIES.

e. SLOPES LOCATED ABOVE THE SLURRY WALL/HIGH-WATER LINE WILL BE VEGETATED TO CONTROL EROSION

f. RIPRAP WILL BE PLACED ON PIT SLOPE AREAS BELOW THE SLURRY WALL TO MINIMIZE EROSION.

g. THERE ARE NO EXISTING PUBLIC ROADS, RAILROADS, OR WATER WELLS WITHIN 500-FEET OF THE SITE.

h. EXISTING SOUTHERN CALIFORNIA EDISON (SCE) POWER LINES RUN ALONG THE NORTHERN PERIMETER OF THE SITE. THE PROPOSED WASH/SCREEN PLANT WILL CONNECT TO THESE EXISTING UTILITIES. NO OTHER UTILITIES (GAS TELEPHONE, WATER, ETC.) EXISTING WITHIN 500-FEET OF THE SITE.

i. DUST WILL BE CONTROLLED THROUGHOUT THE SITE/ON UNPAVED ROADS USING A MOBILE WATER TRUCK.

SOURCE MATERIAL FROM: PROVOST & PRITCHARD CONSULTING GROUP (2021)

DATUM: HORZ= NAD83, CALIFORNIA ZONE 4, US FOOT
VERT=NAVD88
IMAGERY: GOOGLE EARTH, 02/08/2018

Source: Provost & Pritchard Consulting Group / Sespe Consulting, Inc. (2021)

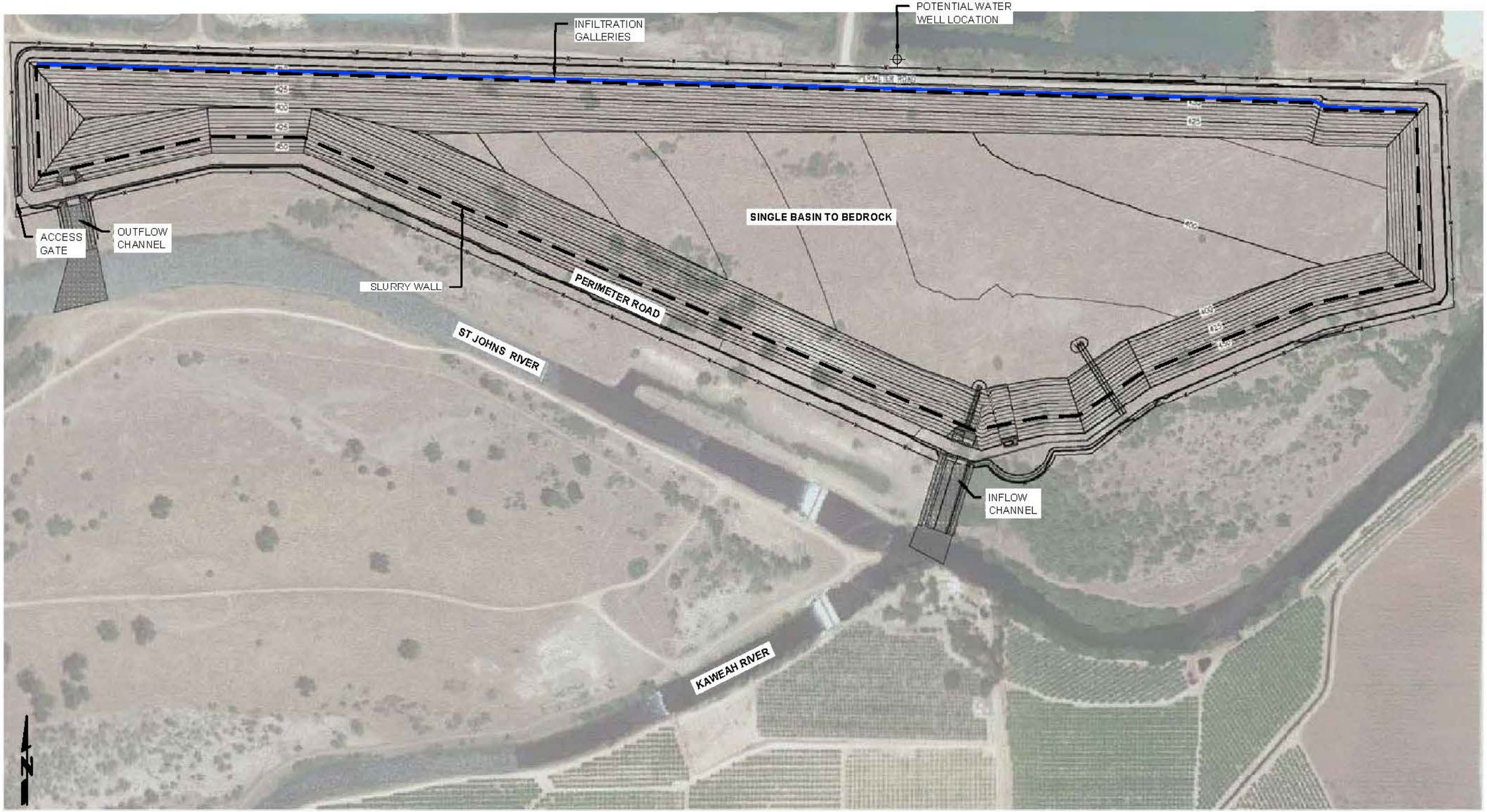
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FIGURE 3

PROJECT EXCAVATION SITE PLAN
McKay Point Reservoir Project
Tulare Irrigation District
Tulare County, California

PROJECT #:	TU01.20.11	DATE:	5/3/21
SCALE:	As Shown	DRAWN BY:	Sespe



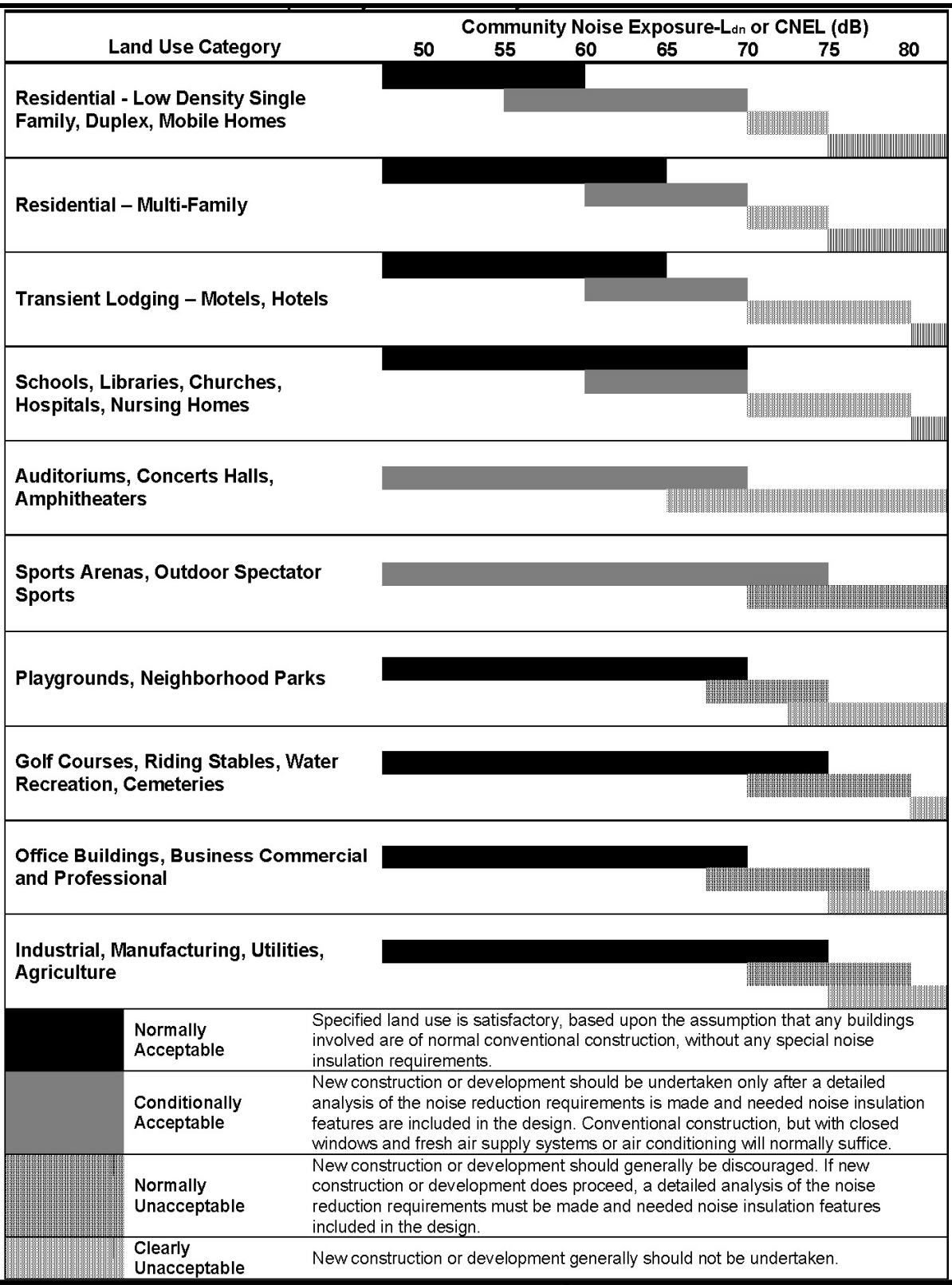
SOURCE MATERIAL FROM:
PROVOST & PRITCHARD
CONSULTING GROUP

Source: Provost & Pritchard Consulting Group / Sespe Consulting, Inc. (2020)

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SESPE CONSULTING, INC.

FIGURE	PROJECT RESERVOIR SITE PLAN McKay Point Reservoir Project Tulare Irrigation District Tulare County, California		
4			
PROJECT #:	TU01.20.11	DATE:	12/4/20
SCALE:	As Shown	DRAWN BY:	Sespe



Source: Tulare County General Plan - 2030 Update (August 2012)

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FIGURE 5

LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS
McKay Point Reservoir Project
Tulare County, California

PROJECT #:	TU01.20.11	DATE:	12/4/20
SCALE:	N/A	DRAWN BY:	GPS



Source: Google Earth (2020)

- Approximate McKay Point Property Boundaries
- Long-Duration (24-hour) Monitoring Location
- Short-Duration (15-minute) Monitoring Locations
- Receptor Locations

* - Distance from R1 property boundarty to Project site = 465-feet

N

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FIGURE 6	PROJECT RECEPTORS McKay Point Reservoir Project Tulare Irrigation District Tulare County, California		
PROJECT #:	TU01.20.11	DATE:	12/4/20
SCALE:	As Shown	DRAWN BY:	Sespe

APPENDIX B

Regulatory References

10.8 Noise

HS-8 To protect County residents and visitors from the harmful effects of excessive noise while promoting the County economic base.

HS-8.1 Economic Base Protection
The County shall protect its economic base by preventing the encroachment of incompatible land uses on known noise-producing industries, railroads, airports, and other sources.

HS-8.2 Noise Impacted Areas
The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB Ldn (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.

HS-8.3 Noise Sensitive Land Uses
The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB Ldn (or CNEL) or less within outdoor activity areas and 45 dB Ldn (or CNEL) or less within interior living spaces.

HS-8.4 Airport Noise Contours
The County shall ensure new noise sensitive land uses are located outside the 60 CNEL contour of all public use airports.

HS-8.5 State Noise Standards
The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code (UBC). Title 24 requires that interior noise levels not exceed 45 dB Ldn (or CNEL) with the windows and doors closed within new developments of multi-family dwellings, condominiums, hotels, or motels. Where it is not possible to reduce exterior noise levels within an acceptable range the County shall require the application of noise reduction technology to reduce interior noise levels to an acceptable level.

HS-8.6 Noise Level Criteria
The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).

ⓘ *Table 10.1: Land Use Compatibility for Community Noise Environments (see next page), is provided as a reference concerning the sensitivity of different land uses to their noise environment. It is intended to illustrate the range of noise levels which will allow the full range of activities normally associated with a given land use.*

HS-8.7 Inside Noise
The County shall ensure that in instances where the windows and doors must remain closed to achieve the required inside acoustical isolation, mechanical ventilation or air conditioning is provided.

HS-8.8 Adjacent Uses

The County shall not permit development of new industrial, commercial, or other noise-generating land uses if resulting noise levels will exceed 60 dB Ldn (or CNEL) at the boundary of areas designated and zoned for residential or other noise-sensitive uses, unless it is determined to be necessary to promote the public health, safety and welfare of the County.

HS-8.9 County Equipment
The County shall strive to purchase equipment that complies with noise level performance standards set forth in the Health and Safety Element.

HS-8.10 Automobile Noise Enforcement
The County shall encourage the CHP, Sheriff's office, and local police departments to actively enforce existing sections of the California Vehicle Code relating to adequate vehicle mufflers, modified exhaust systems, and other amplified noise.

HS-8.11 Peak Noise Generators
The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

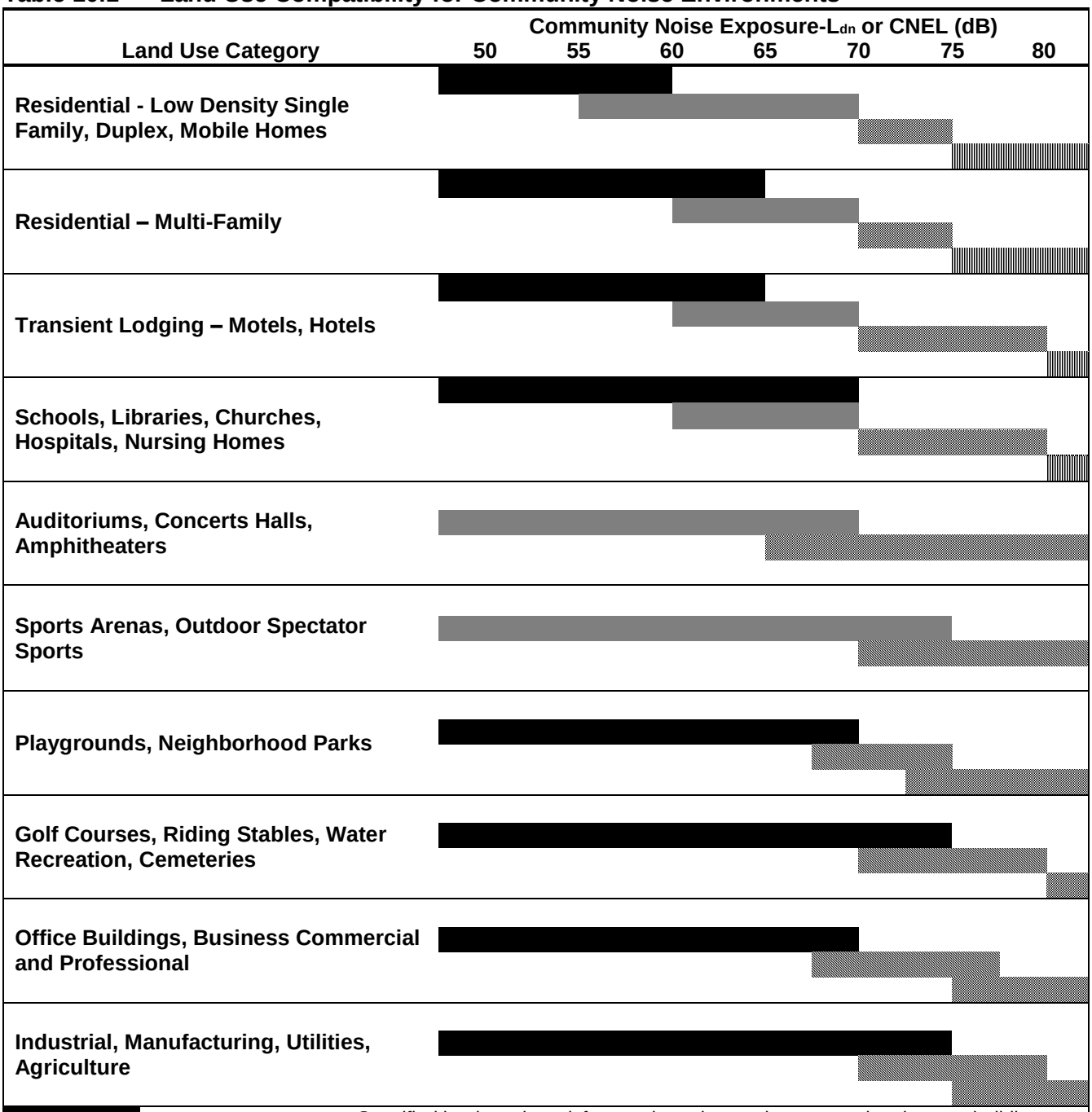
HS-8.12 Foothill and Mountain Noise
For areas designated by Tulare County as being within Foothill and Mountain Planning Areas and outside Foothill Development Corridors, the hourly Leq resulting from the development or new noise-sensitive land uses or new noise-generating sources shall not exceed 50 dB during the day (7:00 a.m.-10:00 p.m.) or 40 dB during the night (10:00 p.m.-7:00 a.m.) when measured at the boundary of areas containing or planned and zoned for residential or other noise-sensitive land uses. For these same areas and under the same circumstances, the maximum A-weighed noise level (Lmax) shall not exceed 70 dB during the day or 60 dB during the night.

HS-8.13 Noise Analysis
The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 of the Health and Safety Element).

HS-8.14 Sound Attenuation Features
The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.

HS-8.15 Noise Buffering
The County shall require noise buffering or insulation in new development along major streets, highways, and railroad tracks.

Table 10.1 Land Use Compatibility for Community Noise Environments



Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable	New construction or development generally should not be undertaken.

[Source: Figure Noise-1. State Land Use Compatibility Standards for Community Noise Environment: California Governor's Office of Planning and Research, October 2003]

HS-8.16 State Noise Insulation
The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.

HS-8.17 Coordinate with Caltrans
The County shall work with Caltrans to mitigate noise impacts on sensitive receptors near State roadways, by requiring noise buffering or insulation in new construction.

HS-8.18 Construction Noise
The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 Construction Noise Control
The County shall ensure that construction contractors implement best practices guidelines (i.e. berms, screens, etc.) as appropriate and feasible to reduce construction-related noise-impacts on surrounding land uses.

10.9 Healthy Communities

HS-9	To support healthy lifestyles among residents of Tulare County through the built environment and land use decisions that play an important role in shaping the pattern of community development, in either promoting or discouraging good health for its citizens.

HS-9.1 Healthy Communities
To the maximum extent feasible, the County shall strive through its land use decisions to promote community health and safety for all neighborhoods in the County by encouraging patterns of development that are safe and influence crime prevention, promote a high-quality physical environment and encourage physical activity by means such as sidewalks and walking and biking paths that discourage automobile dependency in existing communities.

HS-9.2 Walkable Communities
The County shall require where feasible, the development of parks, open space, sidewalks and walking and biking paths that promote physical activity and discourage automobile dependency in all future communities.

Table 1. CA/T equipment noise emissions and acoustical usage factors database.

CA/T Noise Emission Reference Levels and Usage Factors					
filename: EQUIPLST.xls					
revised: 7/26/05		Acoustical	Spec 721.560	Actual Measured	No. of Actual
	Impact	Use Factor	Lmax @ 50ft	Lmax @ 50ft	Data Samples
Equipment Description	Device ?	(%)	(dBA, slow)	(dBA, slow)	(Count)
				(samples averaged)	
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-- N/A --	0
Blasting	Yes	-- N/A --	94	-- N/A --	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-- N/A --	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-- N/A --	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-- N/A --	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-- N/A --	0
Tractor	No	40	84	-- N/A --	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder / Torch	No	40	73	74	5

3.5.1 Barrier Design Goals and Insertion Loss.

The first step in barrier design is to establish the design goals. Design goals may not be limited simply to noise reduction at receivers, but may also include other considerations of safety and maintenance as well. These other considerations are discussed later in Sections 4 through 13.

In this section, the acoustical design goals of noise reduction will be discussed. Acoustical design goals are usually referred to in terms of barrier *Insertion Loss* (IL). IL is defined as the sound level at a given receiver before the construction of a barrier minus the sound level at the same receiver after the construction of the barrier. The construction of a noise barrier usually results in a partial loss of soft-ground attenuation. This is due to the barrier forcing the sound to take a higher path relative to the ground plane. Therefore, barrier IL is the net effect of barrier diffraction, combined with this partial loss of soft-ground attenuation.

Typically, a 5-dB(A) IL can be expected for receivers whose line-of-sight to the roadway is just blocked by the barrier. A general rule-of-thumb is that each additional 1 m of barrier height above line-of-sight blockage will provide about 1.5 dB(A) of additional attenuation (see Figure 13).

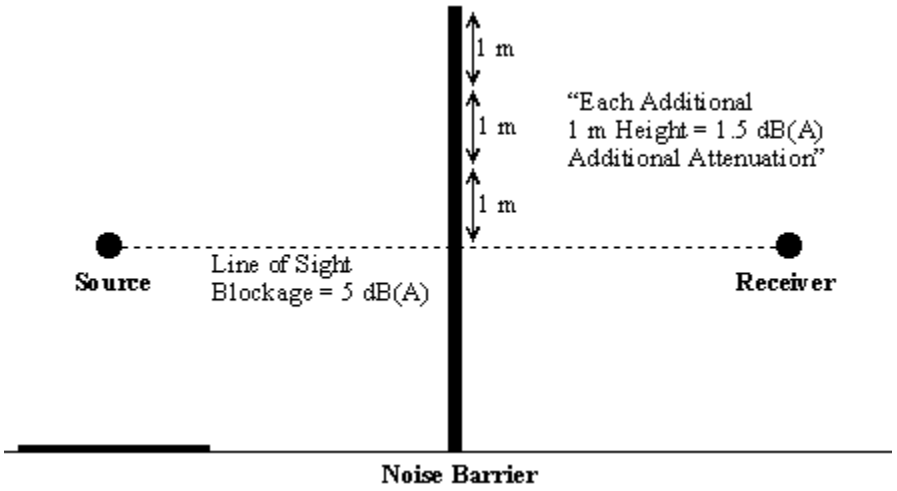


Figure 13. Line-of-sight

Properly-designed noise barriers should attain an IL approaching 10 dB(A), which is equivalent to a perceived halving in loudness for the first row of homes directly behind the barrier. For those residents not directly behind the barrier, a noise reduction of 3 to 5 dB(A) can typically be provided, which is just slightly perceptible to the human ear. Table 4 shows the relationship between barrier IL and design feasibility.

Table 4. Relationship between barrier insertion loss and design feasibility.

Barrier Insertion Loss	Design Feasibility	Reduction in Sound Energy	Relative Reduction in Loudness
5 dB(A)	Simple	68%	Readily perceptible
10 dB(A)	Attainable	90%	Half as loud
15 dB(A)	Very difficult	97%	One-third as loud
20 dB(A)	Nearly impossible	99%	One-fourth as loud

Source: Excerpt from the Federal Highway Administration's *Noise Barrier Design Handbook* (http://www.fhwa.dot.gov/environment/noise/noise_barriers/design_construction/design/design00.cfm)

Table 18. Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 ft. (in/sec)
Vibratory roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Crack-and-seat operations	2.4

Sources: Federal Transit Administration 2018 (except Hanson 2001 for vibratory rollers) and Caltrans 2000 for crack-and seat-operations.

Using these source levels, vibration from this equipment can be estimated by the following formula:

$$PPV_{Equipment} = PPV_{Ref}\,(25/D)^{n} \quad (in/sec) \qquad (Eq.\ 12)$$

Where:

PPV_{Ref} = *reference PPV at 25 ft.*

D = distance from equipment to the receiver in ft.

n = 1.1 (the value related to the attenuation rate through ground)

The suggested value for "n" is 1.1. Because vibration from this equipment originates primarily near the ground surface, modifying the value of "n" based on soil classification may not necessarily be applicable; however, a higher value of "n" based on site-specific soil conditions could be used for a less-conservative estimation of vibration amplitude. FTA recommends a value of "n" of 1.5 for vibration assessment. Using a value of 1.5 is less conservative than using a value of 1.4 or less (as indicated in Table 17) because it assumes that vibration will attenuate at a greater rate.

7.3 Evaluating Potential Vibration Impacts

As shown in Chapter 6, there is limited consistency between the categorization of effects and damage thresholds; however, it is apparent that damage thresholds for continuous sources are less than those for single-event or transient sources. It is also apparent that the vibration from traffic is continuous and that vibration from a single blasting event is a single transient event; however, many types of construction activities fall between a single event and a continuous source. An impact pile driver, for example, continuously generates single transient events. As a practical matter and based on the nature of available criteria, the criteria can only be reasonably separated into two categories: continuous and transient.

APPENDIX C

Tulare County Criteria, Ambient Noise Summaries & Meter Log Data

Ambient/Baseline Noise Measurement Summary + Applicable Significance Thresholds

Tulare County County Significance Thresholds

Ambient Noise Level Summary (dBA)

Receptor [A]	Receptor Type	Study #	Measurement Parameters				Measurement Data/Comparison (L_{eq}) [C]			Average Adjustment Factor (dBA) [C]	Measured Average (L_{eq}) Noise Level	Day-Night (L_{dn}) [D]	
			Duration	Date	Time Start	Time End	15-Minute	24-Hour	dBA Change			Measured	Estimated [C]
Receptor 1 (R1) [B]	Residential	Study #1	24-Hours	10/21/2020	1:29 PM	---	---	43.8	---	---	43.8	47.6	---
				10/22/2020	---	1:29 PM							
Receptor 2 (R2)	Residential	Study #7	15-Minutes	10/21/2020	5:29 PM	5:44 PM	34.7	37.6	-2.9	4.1	44.6	---	51.7
		Study #10	15-Minutes	10/22/2020	10:52 AM	11:07 AM	47.3	36.2	11.2				
Receptor 3 (R3)	Residential	Study #6	15-Minutes	10/21/2020	5:08 PM	5:23 PM	51.1	41.5	9.6	11.7	50.2	---	59.3
		Study #11	15-Minutes	10/22/2020	11:18 AM	11:33 AM	49.2	35.4	13.8				
Receptor 4 (R4)	Residential	Study #5	15-Minutes	10/21/2020	4:42 PM	4:57 PM	39.5	41.7	-2.2	-2.9	37.8	---	44.7
		Study #12	15-Minutes	10/22/2020	11:18 AM	11:33 AM	35.0	38.6	-3.6				
Receptor 5 (R5)	Residential	Study #4	15-Minutes	10/21/2020	3:27 PM	3:42 PM	40.5	42.4	-1.9	9.8	56.5	---	57.4
		Study #13	15-Minutes	10/22/2020	12:06 PM	12:21 AM	59.5	37.9	21.6				
Receptor 6 (R6)	Residential	Study #4	15-Minutes	10/21/2020	3:27 PM	3:42 PM	40.5	42.4	-1.9	9.8	56.5	---	57.4
		Study #13	15-Minutes	10/22/2020	12:06 PM	12:21 AM	59.5	37.9	21.6				
Receptor 7 (R7)	Residential	Study #3	15-Minutes	10/21/2020	3:03 PM	3:18 PM	49.9	41.9	8.0	4.9	47.0	---	52.5
		Study #14	15-Minutes	10/22/2020	12:29 PM	12:44 AM	34.7	32.9	1.8				
Receptor 8 (R8)	Residential	Study #2	15-Minutes	10/21/2020	2:43 PM	2:58 PM	41.9	41.1	0.8	8.5	46.3	---	56.0
		Study #15	15-Minutes	10/22/2020	12:53 PM	1:08 PM	48.4	32.3	16.1				
Receptor 9 (R9)	Residential	Study #8	15-Minutes	10/21/2020	5:50 PM	6:05 PM	35.4	36.2	-0.8	4.2	41.1	---	51.8
		Study #16	15-Minutes	10/22/2020	1:14 PM	1:29 AM	43.4	34.1	9.3				
Receptor 10 (R10)	Residential	Study #9	15-Minutes	10/21/2020	10:25 AM	10:40 AM	48.6	49.0	-0.3	0.2	47.0	---	47.8
		Study #17	15-Minutes	10/22/2020	1:34 PM	1:49 PM	44.5	43.8	0.7				

Tulare County Significance Threshold/Criteria Summary

Receptor	Receptor Type	Tulare County - Day-Night (L_{dn}) Threshold		
		Exterior Noise		
		Ambient Day-Night	County Threshold [E]	Adjusted Threshold [F]
Receptor 1 (R1)	Residential	47.6	60	**60**
Receptor 2 (R2)	Residential	51.7	60	**60**
Receptor 3 (R3)	Residential	59.3	60	**62.3**
Receptor 4 (R4)	Residential	44.7	60	**60**
Receptor 5 (R5)	Residential	57.4	60	**60.4**
Receptor 6 (R6)	Residential	57.4	60	**60.4**
Receptor 7 (R7)	Residential	52.5	60	**60**
Receptor 8 (R8)	Residential	56.0	60	**60**
Receptor 9 (R9)	Residential	51.8	60	**60**
Receptor 10 (R10)	Residential	47.8	60	**60**

Footnotes:

A - Please see Figure 6 (Attachment A) which shows the locations of the residential receptors in relation to the Project site.

B - The 24-hour measurement collected at Receptor 1 (R1) is utilized to represent both the noise level experienced at this residential receptor, as well as a reference value to estimate 24-hour Day-Night (L_{dn}) noise levels experienced at the remaining receptors (R2 through R10).

C - For receptors where only short-duration (30-minutes total) measurements were collected (i.e., R2 through R10), a dBA ±change was calculated by comparing measured L_{eq} noise levels at these locations to the noise levels measured at the 24-hour reference location (i.e., R1) during the identical time period(s). The difference between these values (i.e., correction factor) is then applied to the 24-hour Day-Night (L_{dn}) noise level measured at R1 to estimate the appropriate L_{dn} noise levels at the remaining receptors (R2 through R10).

D - Per the Tulare County General Plan, the Day-Night (L_{dn}) average noise level is a long-term (24-hour) average weighted sound level, where a +10 dBA weight is added to noise levels occurring during nighttime hours (10:00 p.m. - 7:00 a.m.). This noise metric is meant to account for the extra annoyance noise impacts caused during the quieter nighttime hours.

E - Values shown represent the applicable Tulare County noise significance threshold, taken from the current General Plan (Tulare County, 2012).

F - Although not specified within the Tulare County guidance documents, generally in cases where the existing ambient noise levels already exceed the applicable standard, the noise standard is increased by +3 dBA increments to encompass the ambient noise. This concept is derived from the fact that a +3 dBA noise level increase is generally accepted as the minimum perceptible change in noise resulting from a source. Additionally, if ambient noise levels are within ±1 dBA of the applicable significance threshold, the applicable County noise level standards are increased by +3 dBA increments to encompass the ambient. Specifically, this concept is applied to Receptors R3, R5 and R6. Because the existing ambient noise already exceeds or is within ±1 dBA of the applicable Day-Night (L_{dn}) threshold, the Project could not feasibly comply with the County standard. Therefore, the ambient L_{dn} noise level +3 dBA is utilized as a the criteria to determine the significance of Project noise impacts at these receptors.

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
Study #1	0:01:00	0:01:00		46.2	85.6	59.6	35.6	46.2	85.6	59.5	35.6
Receptor 1 (R1)	0:02:00	0:02:00		49	89.2	59.1	36.5	49	89.2	59.1	36.5
	0:03:00	0:03:00		36.9	58	39	35.5	36.9	58	39	35.5
	0:04:00	0:04:00		39.3	61.6	43.8	36.4	39.3	61.6	43.8	36.4
	0:05:00	0:05:00		48.3	70.2	53.3	39.9	48.3	70.3	53.3	39.9
	0:06:00	0:06:00		49.4	70.9	53	40.7	49.4	70.9	53	40.6
	0:07:00	0:07:00		48.8	70.3	52.9	40	48.8	70.3	52.8	40
	0:08:00	0:08:00		47.8	69.8	52.3	39.9	47.7	69.8	52.3	39.9
	0:09:00	0:09:00		43	68.1	50.7	37.7	43	68.1	50.6	37.6
	0:10:00	0:10:00		43.4	67.4	51.1	37.6	43.3	67.5	51.1	37.6
	0:11:00	0:11:00		43.6	68.9	51	35.2	43.6	68.9	51	35.2
	0:12:00	0:12:00		37.9	60.8	42.4	34.9	37.9	60.8	42.4	34.8
	0:13:00	0:13:00		38.5	63	41.6	34.7	38.5	62.9	41.6	34.7
	0:14:00	0:14:00		38.3	55.9	42.7	35.7	38.3	55.9	42.7	35.6
	0:15:00	0:15:00		37.7	56	38.8	36	37.7	56.3	38.8	36
	0:16:00	0:16:00		38.4	63.6	42.8	36	38.4	63.4	42.7	36
	0:17:00	0:17:00		36.7	55.9	40.1	35.2	36.7	56.3	40.1	35.2
	0:18:00	0:18:00		39.6	57.3	42.2	37.7	39.6	57.2	42.2	37.6
	0:19:00	0:19:00		40.8	60.2	42.9	37.8	40.8	60.4	42.9	37.8
	0:20:00	0:20:00		41.1	64	44.6	36.8	41.1	63.8	44.5	36.8
	0:21:00	0:21:00		38.2	61.5	41.3	36.5	38.2	61.4	41.3	36.4
	0:22:00	0:22:00		37.4	55.3	39.1	36.2	37.4	55	39.1	36.2
	0:23:00	0:23:00		39.7	59.4	41.8	37.1	39.7	59.3	41.8	37.1
	0:24:00	0:24:00		39.6	60.9	43.3	36.5	39.6	61.1	43.3	36.5
	0:25:00	0:25:00		42.4	61.9	45.8	39.8	42.3	61.7	45.8	39.7
	0:26:00	0:26:00		41.3	58.3	43.9	39.4	41.3	58.3	43.9	39.3
	0:27:00	0:27:00		43.6	61	47.4	36.9	43.6	61.1	47.4	36.9
	0:28:00	0:28:00		39.2	58.7	41.1	36.9	39.2	58.7	41.1	36.8
	0:29:00	0:29:00		38.5	56.7	40.3	37.2	38.5	56.9	40.3	37.2
	0:30:00	0:30:00		38.4	56	41.6	36.7	38.4	56.1	41.6	36.7
	0:31:00	0:31:00		38.4	60.5	40.5	37	38.4	60.5	40.5	37
	0:32:00	0:32:00		40.5	68.4	46.7	38	40.5	68.4	46.6	38
	0:33:00	0:33:00		39.3	58	44.5	36.3	39.2	58	44.5	36.3
	0:34:00	0:34:00		43.6	64.4	47.6	37.6	43.6	64.3	47.6	37.6
	0:35:00	0:35:00		43.1	62.2	46.5	38.6	43.1	62.2	46.5	38.6
	0:36:00	0:36:00		42.1	59.9	45	38.2	42.1	59.9	45	38.2
	0:37:00	0:37:00		43.1	60.7	45.1	40.9	43.1	60.6	45.1	40.9
	0:38:00	0:38:00		42.3	61.9	44	40.1	42.3	61.8	44	40.1
	0:39:00	0:39:00		43.4	61.2	45.9	40.6	43.4	61.2	45.8	40.6
	0:40:00	0:40:00		41.9	61.5	43.9	40.1	41.8	61.4	43.9	40.1
	0:41:00	0:41:00		42.6	63.2	44.5	39.2	42.5	63.2	44.5	39.2
	0:42:00	0:42:00		39.6	62.5	46.4	37.6	39.6	62.3	46.4	37.6
	0:43:00	0:43:00		39.1	56.8	43.2	35.8	39.1	56.8	43.2	35.8
	0:44:00	0:44:00		41.7	62.4	44.7	39.3	41.7	62.5	44.7	39.3
	0:45:00	0:45:00		38.8	65.6	41.3	35.8	38.8	65.3	41.3	35.8
	0:46:00	0:46:00		41.1	57.8	42.6	38.6	41.1	57.9	42.6	38.6
	0:47:00	0:47:00		43	60.6	44.8	41.5	43	60.6	44.8	41.4
	0:48:00	0:48:00		43.9	62.1	47.9	40.4	43.9	62.1	47.9	40.4
	0:49:00	0:49:00		38.6	57.3	41.9	36.8	38.6	57.4	41.8	36.8
	0:50:00	0:50:00		38.6	62.7	41.2	36	38.6	62.8	41.2	36
	0:51:00	0:51:00		40.6	63.1	45.5	36.6	40.6	63.1	45.5	36.6
	0:52:00	0:52:00		38.7	61.7	46.5	35.7	38.7	61.7	46.5	35.6
	0:53:00	0:53:00		40.6	64.3	47.4	36.2	40.5	64.1	47.4	36.2
	0:54:00	0:54:00		39.6	62.8	45.2	35.3	39.5	62.7	45.1	35.3
	0:55:00	0:55:00		41.6	67.9	46.3	35.8	41.6	68	46.3	35.7
	0:56:00	0:56:00		41.8	63.8	47.1	36	41.8	63.8	47.1	36
	0:57:00	0:57:00		43.9	73.3	51.1	39.8	43.9	73.3	51.1	39.8
	0:58:00	0:58:00		42.9	62	47.9	39.4	42.8	62	47.8	39.3
	0:59:00	0:59:00		40	63.9	44.2	37	39.9	63.9	44.1	37
	1:00:00	1:00:00		36.9	60.8	39.2	35	36.9	61.1	39.2	34.9
	1:01:00	1:01:00		36.5	64.3	41.4	34.2	36.5	64.3	41.4	34.2
	1:02:00	1:02:00		35.8	66.3	38.8	33.5	35.8	66.2	38.8	33.5
	1:03:00	1:03:00		37.8	63.7	41.6	35.3	37.7	63.7	41.6	35.2
	1:04:00	1:04:00		39.1	57	43.8	36.6	39.1	57.1	43.8	36.6
	1:05:00	1:05:00		40.1	56.7	43.5	36.6	40.1	56.8	43.5	36.5
	1:06:00	1:06:00		40.2	57.3	44	37.4	40.2	57.2	43.9	37.4
	1:07:00	1:07:00		41.2	61.6	46.2	36.5	41.2	61.6	46.2	36.5
	1:08:00	1:08:00		41.1	60.3	42.8	38.9	41.1	60	42.8	38.9
	1:09:00	1:09:00		39.4	59.4	40.9	37.6	39.4	59.3	40.9	37.6
	1:10:00	1:10:00		41.2	58.2	45.1	37.3	41.2	58.2	45.1	37.3
	1:11:00	1:11:00		43.4	68	46.8	40.7	43.4	68	46.8	40.6
	1:12:00	1:12:00		40.5	60.1	42.9	38.3	40.5	60.1	42.8	38.2
	1:13:00	1:13:00		41.7	58.1	43.3	40.8	41.7	58.3	43.2	40.8
	1:14:00	1:14:00		43	65.4	46.8	41.2	43	65.4	46.7	41.1
	1:15:00	1:15:00		40	64.6	43.2	36.2	40	64.5	43.2	36.2
	1:16:00	1:16:00		39.9	63.9	42.4	38.3	39.9	63.9	42.4	38.2
	1:17:00	1:17:00		41.5	64.5	46.1	38.3	41.5	64.4	46.1	38.3
	1:18:00	1:18:00		42.7	64.9	47.7	38.6	42.7	64.9	47.7	38.6
	1:19:00	1:19:00		40.2	61.4	43.7	37.7	40.2	61.4	43.7	37.7
	1:20:00	1:20:00		39.5	62.3	41.9	37.7	39.5	62.4	41.9	37.7
	1:21:00	1:21:00		41.7	63.8	44.7	39.2	41.7	63.7	44.7	39.2
	1:22:00	1:22:00		41.2	58.8	42.8	39	41.2	58.8	42.8	39

24-Hour (Study #1)

L_{eq} 43.8

L_{dn} 47.6

CNEL 47.6

	Time	Date	24-Hour Data $L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	15-Minute Data Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
	1:29 PM	10/21/2020									
	1:30 PM	10/21/2020	41686.9	46.2	41686.9	46.2	41686.9				
	1:31 PM	10/21/2020	79432.8	49.0	79432.8	49.0	79432.8				
	1:32 PM	10/21/2020	4897.8	36.9	4897.8	36.9	4897.8				
	1:33 PM	10/21/2020	8511.4	39.3	8511.4	39.3	8511.4				
	1:34 PM	10/21/2020	67608.3	48.3	67608.3	48.3	67608.3				
Study #17	1:35 PM	10/21/2020	87096.4	49.4	87096.4	49.4	87096.4	38.0	6309.6	38.0	6309.6
Study #17	1:36 PM	10/21/2020	75857.8	48.8	75857.8	48.8	75857.8	32.0	1584.9	32.0	1584.9
Study #17	1:37 PM	10/21/2020	60256.0	47.8	60256.0	47.8	60256.0	34.7	2951.2	34.7	2951.2
Study #17	1:38 PM	10/21/2020	19952.6	43.0	19952.6	43.0	19952.6	33.0	1995.3	33.0	1995.3
Study #17	1:39 PM	10/21/2020	21877.6	43.4	21877.6	43.4	21877.6	32.7	1862.1	32.7	1862.1
Study #17	1:40 PM	10/21/2020	22908.7	43.6	22908.7	43.6	22908.7	32.7	1862.1	32.7	1862.1
Study #17	1:41 PM	10/21/2020	6166.0	37.9	6166.0	37.9	6166.0	32.5	1778.3	32.5	1778.3
Study #17	1:42 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5	32.1	1621.8	32.1	1621.8
Study #17	1:43 PM	10/21/2020	6760.8	38.3	6760.8	38.3	6760.8	32.1	1621.8	32.1	1621.8
Study #17	1:44 PM	10/21/2020	5888.4	37.7	5888.4	37.7	5888.4	33.9	2454.7	33.9	2454.7
Study #17	1:45 PM	10/21/2020	6918.3	38.4	6918.3	38.4	6918.3	55.8	380189.4	55.8	380189.4
Study #17	1:46 PM	10/21/2020	4677.4	36.7	4677.4	36.7	4677.4	33.2	2089.3	33.2	2089.3
Study #17	1:47 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1	39.8	9549.9	39.8	9549.9
Study #17	1:48 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6	37.1	5128.6	37.1	5128.6
Study #17	1:49 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5	35.5	3548.1	35.5	3548.1
	1:50 PM	10/21/2020	6606.9	38.2	6606.9	38.2	6606.9				
	1:51 PM	10/21/2020	5495.4	37.4	5495.4	37.4	5495.4				
	1:52 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5				
	1:53 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1				
	1:54 PM	10/21/2020	17378.0	42.4	17378.0	42.4	17378.0				
	1:55 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6				
	1:56 PM	10/21/2020	22908.7	43.6	22908.7	43.6	22908.7				
	1:57 PM	10/21/2020	8317.6	39.2	8317.6	39.2	8317.6				
	1:58 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5				
	1:59 PM	10/21/2020	6918.3	38.4	6918.3	38.4	6918.3				
	2:00 PM	10/21/2020	6918.3	38.4	6918.3	38.4	6918.3				
	2:01 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2				
Study #18	2:02 PM	10/21/2020	8511.4	39.3	8511.4	39.3	8511.4	41.7	14791.1	41.7	14791.1
Study #18	2:03 PM	10/21/2020	22908.7	43.6	22908.7	43.6	22908.7	38.3	6760.8	38.3	6760.8
Study #18	2:04 PM	10/21/2020	20417.4	43.1	20417.4	43.1	20417.4	37.4	5495.4	37.4	5495.4
Study #18	2:05 PM	10/21/2020	16218.1	42.1	16218.1	42.1	16218.1	35.0	3162.3	35.0	3162.3
Study #18	2:06 PM	10/21/2020	20417.4	43.1	20417.4	43.1	20417.4	36.7	4677.4	36.7	4677.4
Study #18	2:07 PM	10/21/2020	16982.4	42.3	16982.4	42.3	16982.4	36.6	4570.9	36.6	4570.9
Study #18	2:08 PM	10/21/2020	21877.6	43.4	21877.6	43.4	21877.6	34.8	3020.0	34.8	3020.0
Study #18	2:09 PM	10/21/2020	15488.2	41.9	15488.2	41.9	15488.2	38.0	6309.6	38.0	6309.6
Study #18	2:10 PM	10/21/2020	18197.0	42.6	18197.0	42.6	18197.0	39.4	8709.6	39.4	8709.6
Study #18	2:11 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1	39.1	8128.3	39.1	8128.3
Study #18	2:12 PM	10/21/2020	8128.3	39.1	8128.3	39.1	8128.3	48.1	64565.4	48.1	64565.4
Study #18	2:13 PM	10/21/2020	14791.1	41.7	14791.1	41.7	14791.1	39.0	7943.3	39.0	7943.3
Study #18	2:14 PM	10/21/2020	7585.8	38.8	7585.8	38.8	7585.8	38.9	7762.5	38.9	7762.5
Study #18	2:15 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5	37.2	5248.1	37.2	5248.1
Study #18	2:16 PM	10/21/2020	19952.6	43.0	19952.6	43.0	19952.6	37.7	5888.4	37.7	5888.4
	2:17 PM	10/21/2020	24547.1	43.9	24547.1	43.9	24547.1				
	2:18 PM	10/21/2020	7244.4	38.6	7244.4	38.6	7244.4				
	2:19 PM	10/21/2020	7244.4	38.6	7244.4	38.6	7244.4				
	2:20 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5				
	2:21 PM	10/21/2020	7413.1	38.7	7413.1	38.7	7413.1				
	2:22 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5				
	2:23 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1				
	2:24 PM	10/21/2020	14454.4	41.6	14454.4	41.6	14454.4				
	2:25 PM	10/21/2020	15135.6	41.8	15135.6	41.8	15135.6				
	2:26 PM	10/21/2020	24547.1	43.9	24547.1	43.9	24547.1				
	2:27 PM	10/21/2020	19498.4	42.9	19498.4	42.9	19498.4				
	2:28 PM	10/21/2020	10000.0	40.0	10000.0	40.0	10000.0				
	2:29 PM	10/21/2020	4897.8	36.9	4897.8	36.9	4897.8				
	2:30 PM	10/21/2020	4466.8	36.5	4466.8	36.5	4466.8				
	2:31 PM	10/21/2020	3801.9	35.8	3801.9	35.8	3801.9				
	2:32 PM	10/21/2020	6025.6	37.8	6025.6	37.8	6025.6				
	2:33 PM	10/21/2020	8128.3	39.1	8128.3	39.1	8128.3				
	2:34 PM	10/21/2020	10232.9	40.1	10232.9	40.1	10232.9				
	2:35 PM	10/21/2020	10471.3	40.2	10471.3	40.2	10471.3				
	2:36 PM	10/21/2020	13182.6	41.2	13182.6	41.2	13182.6				
	2:37 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5				
	2:38 PM	10/21/2020	8709.6	39.4	8709.6	39.4	8709.6				
	2:39 PM	10/21/2020	13182.6	41.2	13182.6	41.2	13182.6				
	2:40 PM	10/21/2020	21877.6	43.4	21877.6	43.4	21877.6				
	2:41 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2				
	2:42 PM	10/21/2020	14791.1	41.7	14791.1	41.7	14791.1				
	2:43 PM	10/21/2020	19952.6	43.0	19952.6	43.0	19952.6				
Study #2	2:44 PM	10/21/2020	10000.0	40.0	10000.0	40.0	10000.0	45.8	38018.9	45.8	38018.9
Study #2	2:45 PM	10/21/2020	9772.4	39.9	9772.4	39.9	9772.4	45.3	33884.4	45.3	33884.4
Study #2	2:46 PM	10/21/2020	14125.4	41.5	14125.4	41.5	14125.4	39.6	9120.1	39.6	9120.1
Study #2	2:47 PM	10/21/2020	18620.9	42.7	18620.9	42.7	18620.9	39.8	9549.9	39.8	9549.9
Study #2	2:48 PM	10/21/2020	10471.3	40.2	10471.3	40.2	10471.3	42.3	16982.4	42.3	16982.4
Study #2	2:49 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5	39.4	8709.6	39.4	8709.6
Study #2	2:50 PM	10/21/2020	14791.1	41.7	14791.1	41.7	14791.1	38.0	6309.6	38.0	6309.6
Study #2	2:51 PM	10/21/2020	13182.6	41.2	13182.6	41.2	13182.6	41.3	13489.6	41.3	13489.6

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	1:23:00	1:23:00		39.7	58.8	42.5	37.1	39.6	58.4	42.5	37.1
	1:24:00	1:24:00		42.4	59.8	45.7	37	42.4	59.7	45.7	37
	1:25:00	1:25:00		41.1	70.4	45.1	37.8	41.1	70.4	45	37.7
	1:26:00	1:26:00		42.3	61.1	46.5	36.7	42.3	60.9	46.5	36.7
	1:27:00	1:27:00		38.7	57.7	42.3	36.4	38.7	57.8	42.3	36.4
	1:28:00	1:28:00		41.8	60.8	44.4	39.9	41.8	60.7	44.3	39.9
	1:29:00	1:29:00		41	58.3	43.3	38.1	40.9	58.3	43.3	38.1
	1:30:00	1:30:00		42.9	60	45.3	40.1	42.9	60	45.3	40.1
	1:31:00	1:31:00		40.8	59.5	45.3	38.8	40.8	59.1	45.3	38.8
	1:32:00	1:32:00		40.2	58.5	42	38.4	40.2	58.4	42	38.4
	1:33:00	1:33:00		41	69.2	42.5	39	41	69.2	42.5	39
	1:34:00	1:34:00		41.1	59.6	44.4	37	41	59.7	44.4	37
	1:35:00	1:35:00		43.5	64.3	48.1	40.2	43.5	64.1	48.1	40.2
	1:36:00	1:36:00		42	60.2	44.5	39.5	42	60.4	44.5	39.4
	1:37:00	1:37:00		41.4	68.9	47.2	39.1	41.4	68.9	47.2	39.1
	1:38:00	1:38:00		40.9	61.7	43.2	38.3	40.9	61.7	43.2	38.3
	1:39:00	1:39:00		40.8	57.1	42.9	38.1	40.7	57.2	42.9	38.1
	1:40:00	1:40:00		42.9	59.8	45.2	40	42.9	59.9	45.1	40
	1:41:00	1:41:00		44.8	69.1	46.6	43	44.8	69	46.6	42.9
	1:42:00	1:42:00		45.2	67.4	47.5	41.3	45.2	67.3	47.4	41.3
	1:43:00	1:43:00		42.5	63.5	45.5	39.6	42.5	63.5	45.5	39.6
	1:44:00	1:44:00		40.3	58	43	36.6	40.3	57.8	43	36.5
	1:45:00	1:45:00		38.1	62.3	39.7	36.5	38.1	62.5	39.6	36.4
	1:46:00	1:46:00		38.9	67.7	44.6	36	38.8	67.7	44.6	36
	1:47:00	1:47:00		39.2	70.8	43.2	36	39.1	70.8	43.2	36
	1:48:00	1:48:00		39.4	62.2	43.3	36.5	39.4	62.1	43.3	36.5
	1:49:00	1:49:00		40.7	67.6	43.1	38.6	40.7	67.6	43.1	38.5
	1:50:00	1:50:00		40.2	70.1	42.7	38.5	40.1	70	42.7	38.4
	1:51:00	1:51:00		40.9	61.2	45.3	38.3	40.9	61.1	45.3	38.3
	1:52:00	1:52:00		41.5	72.4	52	38.1	41.5	72.3	52	38
	1:53:00	1:53:00		60.5	87.7	69.4	38.2	60.4	87.6	69.4	38.2
	1:54:00	1:54:00		40.9	69.5	52.5	35.5	40.9	69.5	52.5	35.4
	1:55:00	1:55:00		37.9	62	42.5	36.5	37.9	62.2	42.5	36.5
	1:56:00	1:56:00		40.6	60.3	43.1	38	40.6	60.1	43.1	38
	1:57:00	1:57:00		39.7	58.7	42.2	37.4	39.6	58.6	42.2	37.4
	1:58:00	1:58:00		51.7	76.1	62.2	36.6	51.7	76.1	62.2	36.5
	1:59:00	1:59:00		39.7	58.3	43.4	37	39.7	58.1	43.4	37
	2:00:00	2:00:00		39.2	62.6	43.8	36.1	39.2	62.5	43.8	36
	2:01:00	2:01:00		42.8	70.9	52.9	38.3	42.8	70.9	52.9	38.3
	2:02:00	2:02:00		45.7	66.5	50.1	39.9	45.7	66.6	50.1	39.9
	2:03:00	2:03:00		42.9	59	44.6	41.6	42.9	59.2	44.5	41.5
	2:04:00	2:04:00		44.7	61.1	48.5	41.7	44.7	61	48.5	41.6
	2:05:00	2:05:00		47	69.1	53.5	38.7	47	69.1	53.5	38.6
	2:06:00	2:06:00		41	59.4	43.7	38.1	41	59.5	43.7	38.1
	2:07:00	2:07:00		42.5	61.4	44.4	39.5	42.5	61.4	44.3	39.5
	2:08:00	2:08:00		44.4	73.7	53.3	40.7	44.4	73.7	53.3	40.7
	2:09:00	2:09:00		37	58.4	41.3	34.7	37	58.2	41.3	34.7
	2:10:00	2:10:00		37.5	61.6	39.5	35.3	37.5	61.4	39.4	35.2
	2:11:00	2:11:00		37.2	53.9	39	35.5	37.2	54.5	39	35.5
	2:12:00	2:12:00		37.2	61.9	40.5	35.5	37.2	61.9	40.5	35.5
	2:13:00	2:13:00		40.5	63.5	46.6	36.7	40.5	63.4	46.6	36.7
	2:14:00	2:14:00		42.1	59.6	46.9	38.4	42.1	59.5	46.8	38.4
	2:15:00	2:15:00		41.4	57.5	43.9	38.9	41.3	57.7	43.8	38.9
	2:16:00	2:16:00		38.8	59.7	41.4	36.9	38.7	59.6	41.4	36.9
	2:17:00	2:17:00		41.6	60.6	48.2	37.6	41.6	60.7	48.2	37.6
	2:18:00	2:18:00		39.9	59.6	45.6	35.5	39.9	59.6	45.6	35.4
	2:19:00	2:19:00		36.8	61.5	42.1	34.4	36.8	61.3	42.1	34.4
	2:20:00	2:20:00		39.6	62	42.8	35.2	39.6	62.2	42.8	35.1
	2:21:00	2:21:00		40.6	58.2	42.4	38.3	40.6	58.4	42.4	38.3
	2:22:00	2:22:00		40.5	61.5	43.4	36.8	40.5	61.3	43.4	36.8
	2:23:00	2:23:00		43.2	63.8	47.4	37.8	43.1	63.8	47.4	37.8
	2:24:00	2:24:00		42.5	63.5	44.9	39.1	42.4	63.4	44.9	39.1
	2:25:00	2:25:00		40.9	58.5	42.8	38.6	40.8	58.4	42.8	38.6
	2:26:00	2:26:00		38.7	57.1	42.3	36	38.7	57.5	42.3	36
	2:27:00	2:27:00		38.8	76.7	43.3	36.3	38.8	76.7	43.2	36.3
	2:28:00	2:28:00		47	76.5	59.8	36.4	47	76.5	59.8	36.4
	2:29:00	2:29:00		39.1	60.4	42.8	35.3	39.1	60.4	42.7	35.2
	2:30:00	2:30:00		40.1	66.9	48.5	36.7	40.1	66.9	48.4	36.7
	2:31:00	2:31:00		40	57.1	42.9	36.4	40	57.1	42.9	36.4
	2:32:00	2:32:00		39.7	65.5	46.4	35.8	39.7	65.4	46.4	35.8
	2:33:00	2:33:00		35.1	58.3	37.7	33.4	35.1	58.3	37.7	33.4
	2:34:00	2:34:00		38.3	56.6	41.5	34.9	38.3	56.9	41.5	34.9
	2:35:00	2:35:00		38.3	59.9	42	35.9	38.3	59.8	41.9	35.8
	2:36:00	2:36:00		36.8	67.5	39.5	34.9	36.7	67.4	39.5	34.9
	2:37:00	2:37:00		36.9	59.3	40.7	34.5	36.9	59.3	40.6	34.5
	2:38:00	2:38:00		39.7	57.5	42.6	36.5	39.7	56.9	42.6	36.5
	2:39:00	2:39:00		39.8	61.8	41.6	36.2	39.8	61.8	41.6	36.2
	2:40:00	2:40:00		42	69.6	50.9	38.5	42	69.6	50.8	38.5
	2:41:00	2:41:00		41.3	69.1	44.8	38.9	41.2	69.1	44.8	38.9
	2:42:00	2:42:00		38.7	64.9	46.4	33.5	38.7	64.7	46.4	33.5
	2:43:00	2:43:00		40.6	69	50.4	34.2	40.6	69	50.3	34.2
	2:44:00	2:44:00		37.7	58.1	42	34	37.7	58	42	34
	2:45:00	2:45:00		38.3	54.9	41	36.3	38.3	54.9	41	36.3
	2:46:00	2:46:00		37.9	56.8	42.2	34.3	37.9	57	42.2	34.2

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #2	2:52 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5	39.4	8709.6	39.4	8709.6
Study #2	2:53 PM	10/21/2020	17378.0	42.4	17378.0	42.4	17378.0	41.6	14454.4	41.6	14454.4
Study #2	2:54 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5	37.4	5495.4	37.4	5495.4
Study #2	2:55 PM	10/21/2020	16982.4	42.3	16982.4	42.3	16982.4	46.9	48977.9	46.9	48977.9
Study #2	2:56 PM	10/21/2020	7413.1	38.7	7413.1	38.7	7413.1	35.6	3630.8	35.6	3630.8
Study #2	2:57 PM	10/21/2020	15135.6	41.8	15135.6	41.8	15135.6	39.5	8912.5	39.5	8912.5
Study #2	2:58 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3	37.6	5754.4	37.6	5754.4
	2:59 PM	10/21/2020	19498.4	42.9	19498.4	42.9	19498.4				
	3:00 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6				
	3:01 PM	10/21/2020	10471.3	40.2	10471.3	40.2	10471.3				
	3:02 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3				
	3:03 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5				
Study #3	3:04 PM	10/21/2020	22387.2	43.5	22387.2	43.5	22387.2	51.3	134896.3	51.3	134896.3
Study #3	3:05 PM	10/21/2020	15848.9	42.0	15848.9	42.0	15848.9	49.1	81283.1	49.1	81283.1
Study #3	3:06 PM	10/21/2020	13803.8	41.4	13803.8	41.4	13803.8	44.1	25704.0	44.1	25704.0
Study #3	3:07 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7	47.0	50118.7	47.0	50118.7
Study #3	3:08 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6	46.9	48977.9	46.9	48977.9
Study #3	3:09 PM	10/21/2020	19498.4	42.9	19498.4	42.9	19498.4	49.4	87096.4	49.4	87096.4
Study #3	3:10 PM	10/21/2020	30199.5	44.8	30199.5	44.8	30199.5	48.7	74131.0	48.7	74131.0
Study #3	3:11 PM	10/21/2020	33113.1	45.2	33113.1	45.2	33113.1	49.8	95499.3	49.8	95499.3
Study #3	3:12 PM	10/21/2020	17782.8	42.5	17782.8	42.5	17782.8	50.7	117489.8	50.7	117489.8
Study #3	3:13 PM	10/21/2020	10715.2	40.3	10715.2	40.3	10715.2	48.8	75857.8	48.8	75857.8
Study #3	3:14 PM	10/21/2020	6456.5	38.1	6456.5	38.1	6456.5	52.1	162181.0	52.1	162181.0
Study #3	3:15 PM	10/21/2020	7762.5	38.9	7762.5	38.9	7762.5	50.7	117489.8	50.7	117489.8
Study #3	3:16 PM	10/21/2020	8317.6	39.2	8317.6	39.2	8317.6	49.9	97723.7	49.9	97723.7
Study #3	3:17 PM	10/21/2020	8709.6	39.4	8709.6	39.4	8709.6	53.3	213796.2	53.3	213796.2
Study #3	3:18 PM	10/21/2020	11749.0	40.7	11749.0	40.7	11749.0	49.2	83176.4	49.2	83176.4
	3:19 PM	10/21/2020	10471.3	40.2	10471.3	40.2	10471.3				
	3:20 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7				
	3:21 PM	10/21/2020	14125.4	41.5	14125.4	41.5	14125.4				
	3:22 PM	10/21/2020	1122018.5	60.5	1122018.5	60.5	1122018.5				
	3:23 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7				
	3:24 PM	10/21/2020	6166.0	37.9	6166.0	37.9	6166.0				
	3:25 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5				
	3:26 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5				
	3:27 PM	10/21/2020	147910.8	51.7	147910.8	51.7	147910.8				
Study #4	3:28 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5	45.3	33884.4	45.3	33884.4
Study #4	3:29 PM	10/21/2020	8317.6	39.2	8317.6	39.2	8317.6	40.6	11481.5	40.6	11481.5
Study #4	3:30 PM	10/21/2020	19054.6	42.8	19054.6	42.8	19054.6	38.4	6918.3	38.4	6918.3
Study #4	3:31 PM	10/21/2020	37153.5	45.7	37153.5	45.7	37153.5	39.5	8912.5	39.5	8912.5
Study #4	3:32 PM	10/21/2020	19498.4	42.9	19498.4	42.9	19498.4	36.2	4168.7	36.2	4168.7
Study #4	3:33 PM	10/21/2020	29512.1	44.7	29512.1	44.7	29512.1	37.1	5128.6	37.1	5128.6
Study #4	3:34 PM	10/21/2020	50118.7	47.0	50118.7	47.0	50118.7	37.6	5754.4	37.6	5754.4
Study #4	3:35 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3	37.6	5754.4	37.6	5754.4
Study #4	3:36 PM	10/21/2020	17782.8	42.5	17782.8	42.5	17782.8	41.6	14454.4	41.6	14454.4
Study #4	3:37 PM	10/21/2020	27542.3	44.4	27542.3	44.4	27542.3	40.7	11749.0	40.7	11749.0
Study #4	3:38 PM	10/21/2020	5011.9	37.0	5011.9	37.0	5011.9	38.4	6918.3	38.4	6918.3
Study #4	3:39 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4	38.2	6606.9	38.2	6606.9
Study #4	3:40 PM	10/21/2020	5248.1	37.2	5248.1	37.2	5248.1	41.1	12882.5	41.1	12882.5
Study #4	3:41 PM	10/21/2020	5248.1	37.2	5248.1	37.2	5248.1	41.5	14125.4	41.5	14125.4
Study #4	3:42 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2	43.3	21379.6	43.3	21379.6
	3:43 PM	10/21/2020	16218.1	42.1	16218.1	42.1	16218.1				
	3:44 PM	10/21/2020	13803.8	41.4	13803.8	41.4	13803.8				
	3:45 PM	10/21/2020	7585.8	38.8	7585.8	38.8	7585.8				
	3:46 PM	10/21/2020	14454.4	41.6	14454.4	41.6	14454.4				
	3:47 PM	10/21/2020	9772.4	39.9	9772.4	39.9	9772.4				
	3:48 PM	10/21/2020	4786.3	36.8	4786.3	36.8	4786.3				
	3:49 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1				
	3:50 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5				
	3:51 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2				
	3:52 PM	10/21/2020	20893.0	43.2	20893.0	43.2	20893.0				
	3:53 PM	10/21/2020	17782.8	42.5	17782.8	42.5	17782.8				
	3:54 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7				
	3:55 PM	10/21/2020	7413.1	38.7	7413.1	38.7	7413.1				
	3:56 PM	10/21/2020	7585.8	38.8	7585.8	38.8	7585.8				
	3:57 PM	10/21/2020	50118.7	47.0	50118.7	47.0	50118.7				
	3:58 PM	10/21/2020	8128.3	39.1	8128.3	39.1	8128.3				
	3:59 PM	10/21/2020	10232.9	40.1	10232.9	40.1	10232.9				
	4:00 PM	10/21/2020	10000.0	40.0	10000.0	40.0	10000.0				
	4:01 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5				
	4:02 PM	10/21/2020	3235.9	35.1	3235.9	35.1	3235.9				
	4:03 PM	10/21/2020	6760.8	38.3	6760.8	38.3	6760.8				
	4:04 PM	10/21/2020	6760.8	38.3	6760.8	38.3	6760.8				
	4:05 PM	10/21/2020	4786.3	36.8	4786.3	36.8	4786.3				
	4:06 PM	10/21/2020	4897.8	36.9	4897.8	36.9	4897.8				
	4:07 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5				
	4:08 PM	10/21/2020	9549.9	39.8	9549.9	39.8	9549.9				
	4:09 PM	10/21/2020	15848.9	42.0	15848.9	42.0	15848.9				
	4:10 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6				
	4:11 PM	10/21/2020	7413.1	38.7	7413.1	38.7	7413.1				
	4:12 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5				
	4:13 PM	10/21/2020	5888.4	37.7	5888.4	37.7	5888.4				
	4:14 PM	10/21/2020	6760.8	38.3	6760.8	38.3	6760.8				
	4:15 PM	10/21/2020	6166.0	37.9	6166.0	37.9	6166.0				

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	2:47:00	2:47:00		36.2	53.3	38.1	34.2	36.2	53.2	38	34.2
	2:48:00	2:48:00		36.8	54.6	40.1	33.9	36.8	55.3	40.1	33.9
	2:49:00	2:49:00		36.6	62.4	41.3	33.5	36.6	62.5	41.3	33.5
	2:50:00	2:50:00		43.9	75.4	57	34.2	43.8	75.4	57	34.1
	2:51:00	2:51:00		37.3	63	39.8	35.1	37.3	62.8	39.8	35.1
	2:52:00	2:52:00		45.8	69.4	51.2	39	45.8	69.4	51.1	39
	2:53:00	2:53:00		43.8	70.3	50.9	35.9	43.8	70.3	50.9	35.9
	2:54:00	2:54:00		37.3	53.7	40.5	35.1	37.3	53.5	40.5	35
	2:55:00	2:55:00		37.5	56.3	41.3	35.4	37.5	56.1	41.3	35.4
	2:56:00	2:56:00		37.5	62.5	45.1	34.8	37.5	62.6	45.1	34.8
	2:57:00	2:57:00		38.9	56.8	41.3	36.9	38.8	56.6	41.3	36.9
	2:58:00	2:58:00		38	56.4	40.4	34.4	38	56.7	40.3	34.4
	2:59:00	2:59:00		40.4	58.4	45.5	35.8	40.4	58.4	45.4	35.8
	3:00:00	3:00:00		36.9	55.7	39.7	34.5	36.8	55.8	39.7	34.5
	3:01:00	3:01:00		41.2	61.1	44.4	36.1	41.1	61	44.4	36.1
	3:02:00	3:02:00		39.5	61.5	43.8	35.7	39.4	61.5	43.8	35.7
	3:03:00	3:03:00		43	60.1	45.3	40.6	42.9	60.1	45.3	40.6
	3:04:00	3:04:00		39.7	61.6	42.9	36.5	39.7	61.3	42.9	36.5
	3:05:00	3:05:00		38.2	59.2	42.4	35.8	38.1	59.1	42.3	35.8
	3:06:00	3:06:00		38.5	63.1	42.8	35.9	38.5	63.1	42.8	35.9
	3:07:00	3:07:00		37.5	61.2	42.4	34.6	37.5	61.1	42.3	34.5
	3:08:00	3:08:00		37.7	59.7	42.6	33.4	37.6	59.7	42.5	33.4
	3:09:00	3:09:00		39.5	64	44.5	36.9	39.5	63.8	44.4	36.9
	3:10:00	3:10:00		40.8	63.8	45.9	37.2	40.8	63.8	45.8	37.2
	3:11:00	3:11:00		41.7	60.8	47.7	37.1	41.7	60.5	47.6	37.1
	3:12:00	3:12:00		42.3	61.1	46.4	39	42.3	61.3	46.4	39
	3:13:00	3:13:00		41.3	59.8	46.2	38	41.3	59.8	46.2	38
	3:14:00	3:14:00		40.9	58	43.8	37.9	40.9	58.2	43.8	37.9
	3:15:00	3:15:00		44	66.1	47.7	40.1	44	66.2	47.7	40.1
	3:16:00	3:16:00		42.8	67.3	47.4	37.5	42.8	67.4	47.4	37.5
	3:17:00	3:17:00		42.2	62.8	44.5	40.3	42.2	62.6	44.4	40.3
	3:18:00	3:18:00		43.5	63.3	46.2	40.3	43.5	63.3	46.2	40.3
	3:19:00	3:19:00		42.7	60.3	46.6	39.7	42.6	60.2	46.5	39.7
	3:20:00	3:20:00		41	60	45.5	34.9	41	60	45.5	34.8
	3:21:00	3:21:00		38.5	63.9	42.8	34.9	38.5	63.8	42.8	34.8
	3:22:00	3:22:00		41	58	44.1	37.9	41	58.1	44.1	37.9
	3:23:00	3:23:00		40.4	57.4	44.8	36.3	40.4	57.3	44.8	36.2
	3:24:00	3:24:00		40.8	56.6	44.5	39.1	40.8	56.6	44.5	39.1
	3:25:00	3:25:00		38.8	66.7	40.6	37.3	38.8	66.6	40.6	37.3
	3:26:00	3:26:00		40	56.6	41.9	37.7	40	56.4	41.9	37.7
	3:27:00	3:27:00		39.5	59.4	42	37.5	39.5	59.2	42	37.5
	3:28:00	3:28:00		43.9	60.3	46.3	39.5	43.8	60.2	46.3	39.5
	3:29:00	3:29:00		43.5	59.3	45.6	40.3	43.5	59.4	45.6	40.3
	3:30:00	3:30:00		48.1	66.3	51	45	48.1	66.3	51	44.9
	3:31:00	3:31:00		44.7	62.3	47.1	41.4	44.7	62.2	47.1	41.4
	3:32:00	3:32:00		44.9	59.6	46.5	42.9	44.9	59.6	46.5	42.8
	3:33:00	3:33:00		40.5	59.3	45	36.9	40.4	59.7	45	36.9
	3:34:00	3:34:00		40.7	60.8	43	39.3	40.7	60.8	42.9	39.3
	3:35:00	3:35:00		43.1	62.9	45.4	40.4	43.1	62.9	45.4	40.4
	3:36:00	3:36:00		42.7	63.3	44.7	40.6	42.6	63.2	44.7	40.5
	3:37:00	3:37:00		47	63.8	50.6	42	47	63.8	50.6	42
	3:38:00	3:38:00		46.8	66	50.1	44.4	46.8	66.1	50.1	44.4
	3:39:00	3:39:00		46.1	63.5	50.6	42.5	46.1	63.4	50.6	42.4
	3:40:00	3:40:00		44.7	62.6	49.9	41.6	44.7	62.6	49.8	41.6
	3:41:00	3:41:00		43.8	68.3	50.3	41.6	43.8	68.4	50.3	41.6
	3:42:00	3:42:00		44.3	67.6	50.3	41.7	44.3	67.6	50.3	41.7
	3:43:00	3:43:00		46.1	66.7	50	43.7	46	66.6	50	43.7
	3:44:00	3:44:00		41.5	59	45.9	37.7	41.4	59.4	45.8	37.7
	3:45:00	3:45:00		38.7	59.8	42	37.6	38.7	59.6	42	37.6
	3:46:00	3:46:00		41.3	60.9	45.7	38.4	41.3	60.8	45.6	38.4
	3:47:00	3:47:00		43.2	68.3	46.4	38.9	43.2	68.3	46.4	38.9
	3:48:00	3:48:00		38.5	59.6	45.6	35.1	38.5	59.6	45.6	35.1
	3:49:00	3:49:00		34.4	54.2	42.3	31.8	34.4	54.3	42.2	31.8
	3:50:00	3:50:00		35.1	58.3	42.9	31.2	35	58.2	42.9	31.2
	3:51:00	3:51:00		34.7	52.5	38.4	31.7	34.7	52.7	38.4	31.7
	3:52:00	3:52:00		39.6	66.2	48.1	32	39.6	66.2	48.1	32
	3:53:00	3:53:00		36.3	65.4	46.9	32.5	36.3	65.3	46.9	32.5
	3:54:00	3:54:00		37	59.1	46	32.4	37	59	46	32.4
	3:55:00	3:55:00		35.3	57.1	43.2	33.1	35.2	56.9	43.2	33
	3:56:00	3:56:00		37	61.8	39.2	35.2	37	61.7	39.2	35.2
	3:57:00	3:57:00		33.8	64.9	36.1	32.3	33.7	64.9	36	32.3
	3:58:00	3:58:00		33.7	55.2	35.4	32.1	33.7	55.4	35.4	32
	3:59:00	3:59:00		40.5	69.5	49.9	32.6	40.5	69.5	49.8	32.6
	4:00:00	4:00:00		38.9	68.7	49.5	32	38.8	68.9	49.5	32
	4:01:00	4:01:00		42.5	71.7	51.9	33	42.5	71.7	51.9	33
	4:02:00	4:02:00		44.4	72.8	54.7	32.3	44.3	72.8	54.6	32.3
	4:03:00	4:03:00		37.1	71.2	50.6	30.6	37.1	71.2	50.5	30.5
	4:04:00	4:04:00		33.7	60.3	41.8	31.1	33.6	60.5	41.8	31.1
	4:05:00	4:05:00		34	62.2	38.3	31.4	34	62.2	38.2	31.4
	4:06:00	4:06:00		34.6	64.4	40.4	31	34.6	64.4	40.4	31
	4:07:00	4:07:00		33.7	57	39.3	30.3	33.6	56.9	39.4	30.2
	4:08:00	4:08:00		33.2	59.1	35.7	31.4	33.2	59.1	35.7	31.4
	4:09:00	4:09:00		35.1	63	42.9	30.5	35	62.9	42.9	30.5
	4:10:00	4:10:00		34.1	57.6	39	31.5	34	57.7	38.9	31.5

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
	4:16 PM	10/21/2020	4168.7	36.2	4168.7	36.2	4168.7				
	4:17 PM	10/21/2020	4786.3	36.8	4786.3	36.8	4786.3				
	4:18 PM	10/21/2020	4570.9	36.6	4570.9	36.6	4570.9				
	4:19 PM	10/21/2020	24547.1	43.9	24547.1	43.9	24547.1				
	4:20 PM	10/21/2020	5370.3	37.3	5370.3	37.3	5370.3				
	4:21 PM	10/21/2020	38018.9	45.8	38018.9	45.8	38018.9				
	4:22 PM	10/21/2020	23988.3	43.8	23988.3	43.8	23988.3				
	4:23 PM	10/21/2020	5370.3	37.3	5370.3	37.3	5370.3				
	4:24 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4				
	4:25 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4				
	4:26 PM	10/21/2020	7762.5	38.9	7762.5	38.9	7762.5				
	4:27 PM	10/21/2020	6309.6	38.0	6309.6	38.0	6309.6				
	4:28 PM	10/21/2020	10964.8	40.4	10964.8	40.4	10964.8				
	4:29 PM	10/21/2020	4897.8	36.9	4897.8	36.9	4897.8				
	4:30 PM	10/21/2020	13182.6	41.2	13182.6	41.2	13182.6				
	4:31 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5				
	4:32 PM	10/21/2020	19952.6	43.0	19952.6	43.0	19952.6				
	4:33 PM	10/21/2020	9332.5	39.7	9332.5	39.7	9332.5				
	4:34 PM	10/21/2020	6606.9	38.2	6606.9	38.2	6606.9				
	4:35 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5				
	4:36 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4				
	4:37 PM	10/21/2020	5888.4	37.7	5888.4	37.7	5888.4				
	4:38 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5				
	4:39 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6				
	4:40 PM	10/21/2020	14791.1	41.7	14791.1	41.7	14791.1				
	4:41 PM	10/21/2020	16982.4	42.3	16982.4	42.3	16982.4				
	4:42 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6				
Study #5	4:43 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7	39.4	8709.6	39.4	8709.6
Study #5	4:44 PM	10/21/2020	25118.9	44.0	25118.9	44.0	25118.9	37.2	5248.1	37.2	5248.1
Study #5	4:45 PM	10/21/2020	19054.6	42.8	19054.6	42.8	19054.6	36.7	4677.4	36.7	4677.4
Study #5	4:46 PM	10/21/2020	16595.9	42.2	16595.9	42.2	16595.9	37.7	5888.4	37.7	5888.4
Study #5	4:47 PM	10/21/2020	22387.2	43.5	22387.2	43.5	22387.2	39.1	8128.3	39.1	8128.3
Study #5	4:48 PM	10/21/2020	18620.9	42.7	18620.9	42.7	18620.9	37.5	5623.4	37.5	5623.4
Study #5	4:49 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3	38.5	7079.5	38.5	7079.5
Study #5	4:50 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5	38.9	7762.5	38.9	7762.5
Study #5	4:51 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3	41.0	12589.3	41.0	12589.3
Study #5	4:52 PM	10/21/2020	10964.8	40.4	10964.8	40.4	10964.8	38.2	6606.9	38.2	6606.9
Study #5	4:53 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6	39.9	9772.4	39.9	9772.4
Study #5	4:54 PM	10/21/2020	7585.8	38.8	7585.8	38.8	7585.8	38.9	7762.5	38.9	7762.5
Study #5	4:55 PM	10/21/2020	10000.0	40.0	10000.0	40.0	10000.0	41.3	13489.6	41.3	13489.6
Study #5	4:56 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5	40.8	12022.6	40.8	12022.6
Study #5	4:57 PM	10/21/2020	24547.1	43.9	24547.1	43.9	24547.1	42.4	17378.0	42.4	17378.0
	4:58 PM	10/21/2020	22387.2	43.5	22387.2	43.5	22387.2				
	4:59 PM	10/21/2020	64565.4	48.1	64565.4	48.1	64565.4				
	5:00 PM	10/21/2020	29512.1	44.7	29512.1	44.7	29512.1				
	5:01 PM	10/21/2020	30903.0	44.9	30903.0	44.9	30903.0				
	5:02 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2				
	5:03 PM	10/21/2020	11749.0	40.7	11749.0	40.7	11749.0				
	5:04 PM	10/21/2020	20417.4	43.1	20417.4	43.1	20417.4				
	5:05 PM	10/21/2020	18620.9	42.7	18620.9	42.7	18620.9				
	5:06 PM	10/21/2020	50118.7	47.0	50118.7	47.0	50118.7				
	5:07 PM	10/21/2020	47863.0	46.8	47863.0	46.8	47863.0				
	5:08 PM	10/21/2020	40738.0	46.1	40738.0	46.1	40738.0				
Study #6	5:09 PM	10/21/2020	29512.1	44.7	29512.1	44.7	29512.1	54.4	275422.9	54.4	275422.9
Study #6	5:10 PM	10/21/2020	23988.3	43.8	23988.3	43.8	23988.3	51.4	138038.4	51.4	138038.4
Study #6	5:11 PM	10/21/2020	26915.3	44.3	26915.3	44.3	26915.3	47.9	61659.5	47.9	61659.5
Study #6	5:12 PM	10/21/2020	40738.0	46.1	40738.0	46.1	40738.0	53.5	223872.1	53.5	223872.1
Study #6	5:13 PM	10/21/2020	14125.4	41.5	14125.4	41.5	14125.4	49.7	93325.4	49.7	93325.4
Study #6	5:14 PM	10/21/2020	7413.1	38.7	7413.1	38.7	7413.1	43.3	21379.6	43.3	21379.6
Study #6	5:15 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6	50.4	109647.8	50.4	109647.8
Study #6	5:16 PM	10/21/2020	20893.0	43.2	20893.0	43.2	20893.0	46.8	47863.0	46.8	47863.0
Study #6	5:17 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5	52.9	194984.5	52.9	194984.5
Study #6	5:18 PM	10/21/2020	2754.2	34.4	2754.2	34.4	2754.2	48.3	67608.3	48.3	67608.3
Study #6	5:19 PM	10/21/2020	3235.9	35.1	3235.9	35.1	3235.9	48.4	69183.1	48.4	69183.1
Study #6	5:20 PM	10/21/2020	2951.2	34.7	2951.2	34.7	2951.2	49.4	87096.4	49.4	87096.4
Study #6	5:21 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1	50.7	117489.8	50.7	117489.8
Study #6	5:22 PM	10/21/2020	4265.8	36.3	4265.8	36.3	4265.8	55.2	331131.1	55.2	331131.1
Study #6	5:23 PM	10/21/2020	5011.9	37.0	5011.9	37.0	5011.9	49.6	91201.1	49.6	91201.1
	5:24 PM	10/21/2020	3388.4	35.3	3388.4	35.3	3388.4				
	5:25 PM	10/21/2020	5011.9	37.0	5011.9	37.0	5011.9				
	5:26 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8				
	5:27 PM	10/21/2020	2344.2	33.7	2344.2	33.7	2344.2				
	5:28 PM	10/21/2020	11220.2	40.5	11220.2	40.5	11220.2				
	5:29 PM	10/21/2020	7762.5	38.9	7762.5	38.9	7762.5				
Study #7	5:30 PM	10/21/2020	17782.8	42.5	17782.8	42.5	17782.8	43.5	22387.2	43.5	22387.2
Study #7	5:31 PM	10/21/2020	27542.3	44.4	27542.3	44.4	27542.3	30.1	1023.3	30.1	1023.3
Study #7	5:32 PM	10/21/2020	5128.6	37.1	5128.6	37.1	5128.6	29.3	851.1	29.3	851.1
Study #7	5:33 PM	10/21/2020	2344.2	33.7	2344.2	33.7	2344.2	29.4	871.0	29.4	871.0
Study #7	5:34 PM	10/21/2020	2511.9	34.0	2511.9	34.0	2511.9	30.2	1047.1	30.2	1047.1
Study #7	5:35 PM	10/21/2020	2884.0	34.6	2884.0	34.6	2884.0	29.0	794.3	29.0	794.3
Study #7	5:36 PM	10/21/2020	2344.2	33.7	2344.2	33.7	2344.2	29.1	812.8	29.1	812.8
Study #7	5:37 PM	10/21/2020	2089.3	33.2	2089.3	33.2	2089.3	28.9	776.2	28.9	776.2
Study #7	5:38 PM	10/21/2020	3235.9	35.1	3235.9	35.1	3235.9	29.3	851.1	29.3	851.1
Study #7	5:39 PM	10/21/2020	2570.4	34.1	2570.4	34.1	2570.4	30.3	1071.5	30.3	1071.5

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	4:11:00	4:11:00		36.5	65.5	47.1	31.2	36.5	65.5	47.1	31.2
	4:12:00	4:12:00		35	62.8	47.8	30.4	34.9	62.8	47.8	30.3
	4:13:00	4:13:00		37.6	63.6	45	30.2	37.5	63.6	45	30.2
	4:14:00	4:14:00		33.4	56.9	38	31	33.3	56.7	37.9	31
	4:15:00	4:15:00		32.8	55.4	37.1	30.3	32.8	55.1	37.1	30.2
	4:16:00	4:16:00		33.1	56.4	38.6	30.6	33.1	56.5	38.6	30.5
	4:17:00	4:17:00		33	60.4	39	31	33	60.4	38.9	31
	4:18:00	4:18:00		35.5	61.3	43.4	30.3	35.5	61.3	43.3	30.3
	4:19:00	4:19:00		35.7	63	44	30.9	35.7	63.1	43.9	30.9
	4:20:00	4:20:00		33	55.2	36.2	30.5	33	55.3	36.2	30.4
	4:21:00	4:21:00		31.5	53.5	35.4	29.7	31.5	53.3	35.4	29.7
	4:22:00	4:22:00		31.7	56.3	35.4	29.7	31.7	56.1	35.4	29.6
	4:23:00	4:23:00		31.2	55.9	35.4	29.4	31.2	56	35.4	29.4
	4:24:00	4:24:00		32.7	57.3	42.2	29.6	32.7	57.4	42.1	29.6
	4:25:00	4:25:00		32.2	53.8	38	29.5	32.1	53.8	38	29.4
	4:26:00	4:26:00		33.8	56.3	39.6	29.7	33.7	56.2	39.5	29.6
	4:27:00	4:27:00		33.4	54.8	42	29.9	33.3	54.8	42	29.9
	4:28:00	4:28:00		32.3	52	38.1	30.3	32.3	52.5	38.1	30.2
	4:29:00	4:29:00		33.3	55.7	39.2	30.3	33.3	55.8	39.2	30.3
	4:30:00	4:30:00		40.9	76.9	52.8	30.3	40.9	76.8	52.7	30.3
	4:31:00	4:31:00		37.5	62.7	46.8	30.3	37.4	62.7	46.7	30.2
	4:32:00	4:32:00		38.3	63.1	47.8	31.3	38.3	63	47.8	31.3
	4:33:00	4:33:00		35.1	64.1	44.1	30	35.1	64	44	29.9
	4:34:00	4:34:00		32.6	55.3	36.2	30.3	32.5	55.7	36.2	30.3
	4:35:00	4:35:00		33.4	61	39.3	30.7	33.4	60.8	39.3	30.7
	4:36:00	4:36:00		42.1	81.7	57.1	30.1	42	81.7	57.1	30
	4:37:00	4:37:00		33.2	57.8	38	30.1	33.2	57.7	38	30.1
	4:38:00	4:38:00		32.8	56.3	36	31	32.8	56.5	36	31
	4:39:00	4:39:00		35.1	56.3	41.7	31.6	35	56.1	41.7	31.6
	4:40:00	4:40:00		35.9	60.6	43.4	31.7	35.9	60.4	43.4	31.7
	4:41:00	4:41:00		33.5	56.2	36.9	31.1	33.4	56.6	36.9	31.1
	4:42:00	4:42:00		32.8	55.9	36	30.6	32.8	55.7	36	30.5
	4:43:00	4:43:00		33.8	60.2	41.3	30.1	33.7	60.3	41.3	30.1
	4:44:00	4:44:00		32.2	59.5	38.2	30	32.2	59.4	38.2	30
	4:45:00	4:45:00		36.5	64.4	45.9	29.8	36.5	64.5	45.8	29.8
	4:46:00	4:46:00		34.7	64	46.2	30.2	34.7	64	46.2	30.2
	4:47:00	4:47:00		31.9	57.4	36	29.9	31.9	57.4	36	29.9
	4:48:00	4:48:00		31.5	52.9	35.1	30	31.5	53.1	35	29.9
	4:49:00	4:49:00		39.8	72.8	53.1	29.8	39.8	72.8	53	29.8
	4:50:00	4:50:00		37	64.5	47.5	30	37	64.4	47.5	30
	4:51:00	4:51:00		33.8	60.2	39.4	30.4	33.8	60.1	39.3	30.4
	4:52:00	4:52:00		32.3	54.2	35.6	30.3	32.3	54.7	35.6	30.2
	4:53:00	4:53:00		32.4	54.3	35.7	30.2	32.3	54.8	35.7	30.1
	4:54:00	4:54:00		31.4	56.3	34.4	29.7	31.4	56	34.4	29.6
	4:55:00	4:55:00		32.5	54.6	40.7	29.8	32.5	54.6	40.7	29.8
	4:56:00	4:56:00		32	51.7	35.9	29.8	32	51.7	35.9	29.7
	4:57:00	4:57:00		35.3	60.5	42.9	30.5	35.3	60.5	42.8	30.4
	4:58:00	4:58:00		31	50.8	33.2	29.7	31	51.1	33.1	29.7
	4:59:00	4:59:00		32.4	53.6	37.2	29.6	32.4	53.6	37.1	29.6
	5:00:00	5:00:00		32.4	52	36	30.5	32.3	52.5	36	30.4
	5:01:00	5:01:00		31.3	56.4	36.2	29.7	31.2	56.1	36.1	29.6
	5:02:00	5:02:00		31.3	55.6	40.4	29.6	31.3	55.4	40.4	29.5
	5:03:00	5:03:00		30.4	55.7	32.2	29.5	30.3	55.6	32.1	29.5
	5:04:00	5:04:00		30.7	55.7	33	29.7	30.7	55.8	33	29.7
	5:05:00	5:05:00		31	53.4	34.3	29.5	31	53.1	34.2	29.5
	5:06:00	5:06:00		31.5	67.4	41.6	29.7	31.5	67.3	41.6	29.7
	5:07:00	5:07:00		35.3	74.2	49.1	29.8	35.3	74.2	49.1	29.8
	5:08:00	5:08:00		30.7	50.5	32.9	29.6	30.7	50.7	32.8	29.6
	5:09:00	5:09:00		38	72	47.7	29.6	37.9	72	47.7	29.6
	5:10:00	5:10:00		30	53	31	29.4	29.9	53	31	29.4
	5:11:00	5:11:00		29.6	46.9	30.4	29.2	29.5	47.1	30.3	29.1
	5:12:00	5:12:00		30	52.1	32.9	28.9	30	51.8	32.9	28.9
	5:13:00	5:13:00		29.8	51.4	33.1	28.8	29.8	51	33	28.7
	5:14:00	5:14:00		30.1	51.3	31.9	28.9	30	51.6	31.8	28.9
	5:15:00	5:15:00		30.4	50.3	31.4	29.6	30.3	50.5	31.3	29.6
	5:16:00	5:16:00		32.4	54.2	35.8	30	32.4	53.5	35.8	30
	5:17:00	5:17:00		31.2	58.3	33.1	30.3	31.1	58.1	33.1	30.3
	5:18:00	5:18:00		31	50.2	32.7	29.8	31	49.2	32.7	29.8
	5:19:00	5:19:00		31.6	55.5	36.5	29.6	31.6	55.6	36.5	29.6
	5:20:00	5:20:00		30.7	49	32.6	29.8	30.7	48.9	32.6	29.7
	5:21:00	5:21:00		30.7	48	34.5	29.6	30.7	48	34.5	29.6
	5:22:00	5:22:00		30.9	48	32.5	29.6	30.8	47.5	32.5	29.6
	5:23:00	5:23:00		31.4	48.7	35.6	29.6	31.4	48.9	35.5	29.6
	5:24:00	5:24:00		30.5	47.5	32.8	29.5	30.5	47.4	32.8	29.5
	5:25:00	5:25:00		30.7	48.8	35	29.4	30.6	48.9	34.9	29.4
	5:26:00	5:26:00		30.3	48.2	33.4	29.7	30.3	47.6	33.4	29.6
	5:27:00	5:27:00		32.2	67.1	41	30.2	32.1	67.1	41	30.2
	5:28:00	5:28:00		31	47.7	33.4	30.3	31	48.1	33.4	30.3
	5:29:00	5:29:00		30.7	53.5	32.9	30	30.7	53	32.8	30
	5:30:00	5:30:00		30.2	47.8	32.5	29.6	30.2	48.6	32.5	29.6
	5:31:00	5:31:00		30.5	48.1	33.8	29.4	30.4	47.7	33.8	29.4
	5:32:00	5:32:00		35.2	61.8	45.7	29.7	35.2	61.9	45.7	29.7
	5:33:00	5:33:00		31.1	53	34.9	29.5	31.1	52.8	34.9	29.5
	5:34:00	5:34:00		30.2	46.4	32.2	29.2	30.1	46.2	32.1	29.1

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #7	5:40 PM	10/21/2020	4466.8	36.5	4466.8	36.5	4466.8	32.7	1862.1	32.7	1862.1
Study #7	5:41 PM	10/21/2020	3162.3	35.0	3162.3	35.0	3162.3	31.1	1288.2	31.1	1288.2
Study #7	5:42 PM	10/21/2020	5754.4	37.6	5754.4	37.6	5754.4	30.3	1071.5	30.3	1071.5
Study #7	5:43 PM	10/21/2020	2187.8	33.4	2187.8	33.4	2187.8	37.7	5888.4	37.7	5888.4
Study #7	5:44 PM	10/21/2020	1905.5	32.8	1905.5	32.8	1905.5	35.5	3548.1	35.5	3548.1
	5:45 PM	10/21/2020	2041.7	33.1	2041.7	33.1	2041.7				
	5:46 PM	10/21/2020	1995.3	33.0	1995.3	33.0	1995.3				
	5:47 PM	10/21/2020	3548.1	35.5	3548.1	35.5	3548.1				
	5:48 PM	10/21/2020	3715.4	35.7	3715.4	35.7	3715.4				
	5:49 PM	10/21/2020	1995.3	33.0	1995.3	33.0	1995.3				
	5:50 PM	10/21/2020	1412.5	31.5	1412.5	31.5	1412.5				
Study #8	5:51 PM	10/21/2020	1479.1	31.7	1479.1	31.7	1479.1	38.0	6309.6	38.0	6309.6
Study #8	5:52 PM	10/21/2020	1318.3	31.2	1318.3	31.2	1318.3	33.1	2041.7	33.1	2041.7
Study #8	5:53 PM	10/21/2020	1862.1	32.7	1862.1	32.7	1862.1	33.2	2089.3	33.2	2089.3
Study #8	5:54 PM	10/21/2020	1659.6	32.2	1659.6	32.2	1659.6	33.5	2238.7	33.5	2238.7
Study #8	5:55 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8	33.4	2187.8	33.4	2187.8
Study #8	5:56 PM	10/21/2020	2187.8	33.4	2187.8	33.4	2187.8	34.0	2511.9	34.0	2511.9
Study #8	5:57 PM	10/21/2020	1698.2	32.3	1698.2	32.3	1698.2	33.8	2398.8	33.8	2398.8
Study #8	5:58 PM	10/21/2020	2138.0	33.3	2138.0	33.3	2138.0	33.5	2238.7	33.5	2238.7
Study #8	5:59 PM	10/21/2020	12302.7	40.9	12302.7	40.9	12302.7	33.1	2041.7	33.1	2041.7
Study #8	6:00 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4	33.8	2398.8	33.8	2398.8
Study #8	6:01 PM	10/21/2020	6760.8	38.3	6760.8	38.3	6760.8	33.4	2187.8	33.4	2187.8
Study #8	6:02 PM	10/21/2020	3235.9	35.1	3235.9	35.1	3235.9	33.2	2089.3	33.2	2089.3
Study #8	6:03 PM	10/21/2020	1819.7	32.6	1819.7	32.6	1819.7	33.5	2238.7	33.5	2238.7
Study #8	6:04 PM	10/21/2020	2187.8	33.4	2187.8	33.4	2187.8	39.0	7943.3	39.0	7943.3
Study #8	6:05 PM	10/21/2020	16218.1	42.1	16218.1	42.1	16218.1	40.4	10964.8	40.4	10964.8
	6:06 PM	10/21/2020	2089.3	33.2	2089.3	33.2	2089.3				
	6:07 PM	10/21/2020	1905.5	32.8	1905.5	32.8	1905.5				
	6:08 PM	10/21/2020	3235.9	35.1	3235.9	35.1	3235.9				
	6:09 PM	10/21/2020	3890.5	35.9	3890.5	35.9	3890.5				
	6:10 PM	10/21/2020	2238.7	33.5	2238.7	33.5	2238.7				
	6:11 PM	10/21/2020	1905.5	32.8	1905.5	32.8	1905.5				
	6:12 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8				
	6:13 PM	10/21/2020	1659.6	32.2	1659.6	32.2	1659.6				
	6:14 PM	10/21/2020	4466.8	36.5	4466.8	36.5	4466.8				
	6:15 PM	10/21/2020	2951.2	34.7	2951.2	34.7	2951.2				
	6:16 PM	10/21/2020	1548.8	31.9	1548.8	31.9	1548.8				
	6:17 PM	10/21/2020	1412.5	31.5	1412.5	31.5	1412.5				
	6:18 PM	10/21/2020	9549.9	39.8	9549.9	39.8	9549.9				
	6:19 PM	10/21/2020	5011.9	37.0	5011.9	37.0	5011.9				
	6:20 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8				
	6:21 PM	10/21/2020	1698.2	32.3	1698.2	32.3	1698.2				
	6:22 PM	10/21/2020	1737.8	32.4	1737.8	32.4	1737.8				
	6:23 PM	10/21/2020	1380.4	31.4	1380.4	31.4	1380.4				
	6:24 PM	10/21/2020	1778.3	32.5	1778.3	32.5	1778.3				
	6:25 PM	10/21/2020	1584.9	32.0	1584.9	32.0	1584.9				
	6:26 PM	10/21/2020	3388.4	35.3	3388.4	35.3	3388.4				
	6:27 PM	10/21/2020	1258.9	31.0	1258.9	31.0	1258.9				
	6:28 PM	10/21/2020	1737.8	32.4	1737.8	32.4	1737.8				
	6:29 PM	10/21/2020	1737.8	32.4	1737.8	32.4	1737.8				
	6:30 PM	10/21/2020	1349.0	31.3	1349.0	31.3	1349.0				
	6:31 PM	10/21/2020	1349.0	31.3	1349.0	31.3	1349.0				
	6:32 PM	10/21/2020	1096.5	30.4	1096.5	30.4	1096.5				
	6:33 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:34 PM	10/21/2020	1258.9	31.0	1258.9	31.0	1258.9				
	6:35 PM	10/21/2020	1412.5	31.5	1412.5	31.5	1412.5				
	6:36 PM	10/21/2020	3388.4	35.3	3388.4	35.3	3388.4				
	6:37 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:38 PM	10/21/2020	6309.6	38.0	6309.6	38.0	6309.6				
	6:39 PM	10/21/2020	1000.0	30.0	1000.0	30.0	1000.0				
	6:40 PM	10/21/2020	912.0	29.6	912.0	29.6	912.0				
	6:41 PM	10/21/2020	1000.0	30.0	1000.0	30.0	1000.0				
	6:42 PM	10/21/2020	955.0	29.8	955.0	29.8	955.0				
	6:43 PM	10/21/2020	1023.3	30.1	1023.3	30.1	1023.3				
	6:44 PM	10/21/2020	1096.5	30.4	1096.5	30.4	1096.5				
	6:45 PM	10/21/2020	1737.8	32.4	1737.8	32.4	1737.8				
	6:46 PM	10/21/2020	1318.3	31.2	1318.3	31.2	1318.3				
	6:47 PM	10/21/2020	1258.9	31.0	1258.9	31.0	1258.9				
	6:48 PM	10/21/2020	1445.4	31.6	1445.4	31.6	1445.4				
	6:49 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:50 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:51 PM	10/21/2020	1230.3	30.9	1230.3	30.9	1230.3				
	6:52 PM	10/21/2020	1380.4	31.4	1380.4	31.4	1380.4				
	6:53 PM	10/21/2020	1122.0	30.5	1122.0	30.5	1122.0				
	6:54 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:55 PM	10/21/2020	1071.5	30.3	1071.5	30.3	1071.5				
	6:56 PM	10/21/2020	1659.6	32.2	1659.6	32.2	1659.6				
	6:57 PM	10/21/2020	1258.9	31.0	1258.9	31.0	1258.9				
	6:58 PM	10/21/2020	1174.9	30.7	1174.9	30.7	1174.9				
	6:59 PM	10/21/2020	1047.1	30.2	1047.1	30.2	1047.1				
	7:00 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
	7:01 PM	10/21/2020	3311.3	35.2	3311.3	40.2	10471.3				
	7:02 PM	10/21/2020	1288.2	31.1	1288.2	36.1	4073.8				
	7:03 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	5:35:00	5:35:00		30.4	57.1	35	29.2	30.4	56.8	35	29.2
	5:36:00	5:36:00		30.6	46.7	32.5	29.8	30.5	46.5	32.4	29.7
	5:37:00	5:37:00		31.5	49.1	35.3	29.8	31.5	49.4	35.3	29.8
	5:38:00	5:38:00		46.9	69.5	51.7	30.1	46.8	69.4	51.7	30.1
	5:39:00	5:39:00		32.5	57.4	42	29.9	32.4	57.4	42	29.9
	5:40:00	5:40:00		33.9	55.9	43.8	30.3	33.9	55.9	43.7	30.3
	5:41:00	5:41:00		36.6	55.3	45.5	30	36.5	55.1	45.5	29.9
	5:42:00	5:42:00		32.6	55.5	43	29.8	32.6	55.2	43	29.8
	5:43:00	5:43:00		29.5	44	30	29	29.5	44.2	30	28.9
	5:44:00	5:44:00		32.3	65.5	44.9	29.5	32.3	65.4	44.8	29.5
	5:45:00	5:45:00		29.9	45.6	30.7	29.3	29.9	46	30.6	29.3
	5:46:00	5:46:00		30.6	52.4	33.8	29.3	30.5	51.8	33.7	29.2
	5:47:00	5:47:00		30.1	50.4	35.6	29.1	30.1	50.4	35.6	29.1
	5:48:00	5:48:00		30.2	50.5	35.5	29.1	30.2	50.2	35.5	29.1
	5:49:00	5:49:00		29.5	49.1	32.3	28.7	29.4	49	32.3	28.7
	5:50:00	5:50:00		29.5	51.1	31.4	28.5	29.4	51.9	31.4	28.5
	5:51:00	5:51:00		29.4	46.4	32	28.8	29.4	46.8	32	28.7
	5:52:00	5:52:00		29.6	50.8	32.3	28.7	29.6	51	32.3	28.7
	5:53:00	5:53:00		29.3	45.7	30	28.9	29.2	45.6	30	28.9
	5:54:00	5:54:00		30	50.8	34.2	29.2	29.9	50.9	34.2	29.1
	5:55:00	5:55:00		29.6	45.6	30.2	29.2	29.6	45.5	30.2	29.2
	5:56:00	5:56:00		29.5	44	30.3	29.2	29.5	44.3	30.2	29.2
	5:57:00	5:57:00		29.8	53.4	34.2	28.9	29.8	53.2	34.2	28.9
	5:58:00	5:58:00		30.2	51.5	36.5	29	30.2	51.8	36.4	29
	5:59:00	5:59:00		29.5	49.8	30.5	29.2	29.5	49.8	30.5	29.2
	6:00:00	6:00:00		30.2	49.7	31.7	29.6	30.2	49.1	31.6	29.6
	6:01:00	6:01:00		30.7	50.3	33.5	29.7	30.7	49.8	33.4	29.6
	6:02:00	6:02:00		29.6	50.3	30.3	28.7	29.6	49.8	30.3	28.7
	6:03:00	6:03:00		28.7	43.4	29.9	28.2	28.6	44.3	29.9	28.2
	6:04:00	6:04:00		28.9	47.5	33.2	28.3	28.8	47.6	33.2	28.3
	6:05:00	6:05:00		28.9	48.6	29.7	28.2	28.9	47.7	29.7	28.3
	6:06:00	6:06:00		29	44.8	29.7	28.4	29	45.3	29.7	28.4
	6:07:00	6:07:00		29.7	47.8	31.8	28.8	29.7	47	31.8	28.7
	6:08:00	6:08:00		29.4	45.3	30	28.7	29.4	45.3	30	28.7
	6:09:00	6:09:00		29.6	44.9	30.2	29.1	29.6	45.1	30.2	29.1
	6:10:00	6:10:00		29.5	49.2	30.7	28.9	29.5	50.1	30.6	28.9
	6:11:00	6:11:00		29.7	50.8	31.6	29.1	29.7	50.7	31.6	29.1
	6:12:00	6:12:00		29.5	57.2	32.5	28.4	29.5	57.1	32.5	28.4
	6:13:00	6:13:00		29.5	51.6	31.1	28.9	29.5	51.2	31.1	28.9
	6:14:00	6:14:00		29.9	58.8	32.4	29.1	29.9	58.5	32.4	29.1
	6:15:00	6:15:00		29.7	50.1	31.3	29	29.7	49.9	31.3	29
	6:16:00	6:16:00		29.9	56.8	32.4	29.4	29.8	56.8	32.4	29.4
	6:17:00	6:17:00		29.7	59.5	31.4	29.2	29.7	59.4	31.4	29.1
	6:18:00	6:18:00		29.7	48.6	30.8	29	29.7	48.4	30.8	28.9
	6:19:00	6:19:00		29.8	55.4	31.1	29	29.8	54.9	31	29
	6:20:00	6:20:00		30.3	49.8	32	29.2	30.3	49.5	31.9	29.2
	6:21:00	6:21:00		30.5	48.3	31.5	29.9	30.5	48.2	31.5	29.9
	6:22:00	6:22:00		30.6	47.4	32.2	30	30.6	47.8	32.2	29.9
	6:23:00	6:23:00		30.6	51.1	32.1	29.7	30.6	50.9	32.1	29.7
	6:24:00	6:24:00		31.4	52.8	37.1	29.9	31.4	52.8	37	29.8
	6:25:00	6:25:00		31.9	55.4	36.7	30	31.9	55.4	36.7	30
	6:26:00	6:26:00		30.9	49.2	32.7	29.9	30.8	48.9	32.7	29.9
	6:27:00	6:27:00		31.7	50.4	33.2	30.3	31.7	50.2	33.2	30.3
	6:28:00	6:28:00		31.5	52.9	35.3	30.6	31.5	52.8	35.2	30.5
	6:29:00	6:29:00		31.2	49.3	32.4	30.3	31.2	49.6	32.4	30.3
	6:30:00	6:30:00		29.9	58.5	31.4	29.3	29.9	58.5	31.4	29.2
	6:31:00	6:31:00		30.5	50.6	32.7	28.9	30.4	50.6	32.6	28.8
	6:32:00	6:32:00		29.5	45.6	31	29.1	29.5	45.3	31	29.1
	6:33:00	6:33:00		29.6	49.6	31.5	28.9	29.6	49.2	31.5	28.9
	6:34:00	6:34:00		30.9	49.4	32.5	29.5	30.9	49.2	32.5	29.5
	6:35:00	6:35:00		30.8	53.9	32.1	29.7	30.8	53.4	32.1	29.7
	6:36:00	6:36:00		31.3	48.5	34.1	29.8	31.2	47.7	34.1	29.8
	6:37:00	6:37:00		30.7	61.5	37.7	29.7	30.6	61.4	37.7	29.6
	6:38:00	6:38:00		29.8	44.8	31.3	28.9	29.8	44.8	31.3	28.8
	6:39:00	6:39:00		30	46.2	31.7	29.1	30	45.9	31.7	29.1
	6:40:00	6:40:00		29.8	49.2	31	28.8	29.7	49.1	31	28.7
	6:41:00	6:41:00		29.8	47.9	31.2	28.8	29.8	47.6	31.2	28.8
	6:42:00	6:42:00		30	56.3	35.6	29.2	30	56.2	35.6	29.2
	6:43:00	6:43:00		32.7	62.8	40.2	29.6	32.6	62.9	40.2	29.5
	6:44:00	6:44:00		30.1	48.8	31.5	29.3	30.1	48.7	31.5	29.2
	6:45:00	6:45:00		30.1	47.1	31.9	29.1	30.1	47.6	31.8	29.1
	6:46:00	6:46:00		30.1	44.9	31.1	29.3	30	45	31.1	29.3
	6:47:00	6:47:00		30.3	58.1	32.7	29.5	30.2	58.2	32.7	29.5
	6:48:00	6:48:00		30	47	31	29	30	46.8	30.9	29.1
	6:49:00	6:49:00		30	45.4	31.5	29.3	30	45.3	31.5	29.2
	6:50:00	6:50:00		30	53.6	32	28.9	29.9	53.1	32	28.9
	6:51:00	6:51:00		30.1	47.1	31.8	29.1	30.1	46.9	31.8	29.1
	6:52:00	6:52:00		30.3	48.9	32.8	29.1	30.3	48.6	32.8	29.1
	6:53:00	6:53:00		31.5	51	36.5	29.3	31.5	51	36.4	29.3
	6:54:00	6:54:00		32.2	47.9	36.2	30.2	32.2	47.6	36.2	30.2
	6:55:00	6:55:00		30.2	46.8	31.7	29.6	30.2	46.4	31.6	29.5
	6:56:00	6:56:00		30.5	49.4	33.4	29.6	30.5	49.5	33.3	29.6
	6:57:00	6:57:00		34.6	62.4	44.4	29.1	34.5	62.4	44.4	29
	6:58:00	6:58:00		36.1	61	42.1	30	36	61	42.1	30

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
7:04 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
7:05 PM	10/21/2020	1148.2	30.6	1148.2	35.6	3630.8				
7:06 PM	10/21/2020	1412.5	31.5	1412.5	36.5	4466.8				
7:07 PM	10/21/2020	48977.9	46.9	48977.9	51.9	154881.7				
7:08 PM	10/21/2020	1778.3	32.5	1778.3	37.5	5623.4				
7:09 PM	10/21/2020	2454.7	33.9	2454.7	38.9	7762.5				
7:10 PM	10/21/2020	4570.9	36.6	4570.9	41.6	14454.4				
7:11 PM	10/21/2020	1819.7	32.6	1819.7	37.6	5754.4				
7:12 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:13 PM	10/21/2020	1698.2	32.3	1698.2	37.3	5370.3				
7:14 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
7:15 PM	10/21/2020	1148.2	30.6	1148.2	35.6	3630.8				
7:16 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
7:17 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
7:18 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:19 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:20 PM	10/21/2020	871.0	29.4	871.0	34.4	2754.2				
7:21 PM	10/21/2020	912.0	29.6	912.0	34.6	2884.0				
7:22 PM	10/21/2020	851.1	29.3	851.1	34.3	2691.5				
7:23 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
7:24 PM	10/21/2020	912.0	29.6	912.0	34.6	2884.0				
7:25 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:26 PM	10/21/2020	955.0	29.8	955.0	34.8	3020.0				
7:27 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
7:28 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:29 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
7:30 PM	10/21/2020	1174.9	30.7	1174.9	35.7	3715.4				
7:31 PM	10/21/2020	912.0	29.6	912.0	34.6	2884.0				
7:32 PM	10/21/2020	741.3	28.7	741.3	33.7	2344.2				
7:33 PM	10/21/2020	776.2	28.9	776.2	33.9	2454.7				
7:34 PM	10/21/2020	776.2	28.9	776.2	33.9	2454.7				
7:35 PM	10/21/2020	794.3	29.0	794.3	34.0	2511.9				
7:36 PM	10/21/2020	933.3	29.7	933.3	34.7	2951.2				
7:37 PM	10/21/2020	871.0	29.4	871.0	34.4	2754.2				
7:38 PM	10/21/2020	912.0	29.6	912.0	34.6	2884.0				
7:39 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:40 PM	10/21/2020	933.3	29.7	933.3	34.7	2951.2				
7:41 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:42 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
7:43 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
7:44 PM	10/21/2020	933.3	29.7	933.3	34.7	2951.2				
7:45 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
7:46 PM	10/21/2020	933.3	29.7	933.3	34.7	2951.2				
7:47 PM	10/21/2020	933.3	29.7	933.3	34.7	2951.2				
7:48 PM	10/21/2020	955.0	29.8	955.0	34.8	3020.0				
7:49 PM	10/21/2020	1071.5	30.3	1071.5	35.3	3388.4				
7:50 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
7:51 PM	10/21/2020	1148.2	30.6	1148.2	35.6	3630.8				
7:52 PM	10/21/2020	1148.2	30.6	1148.2	35.6	3630.8				
7:53 PM	10/21/2020	1380.4	31.4	1380.4	36.4	4365.2				
7:54 PM	10/21/2020	1548.8	31.9	1548.8	36.9	4897.8				
7:55 PM	10/21/2020	1230.3	30.9	1230.3	35.9	3890.5				
7:56 PM	10/21/2020	1479.1	31.7	1479.1	36.7	4677.4				
7:57 PM	10/21/2020	1412.5	31.5	1412.5	36.5	4466.8				
7:58 PM	10/21/2020	1318.3	31.2	1318.3	36.2	4168.7				
7:59 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
8:00 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
8:01 PM	10/21/2020	891.3	29.5	891.3	34.5	2818.4				
8:02 PM	10/21/2020	912.0	29.6	912.0	34.6	2884.0				
8:03 PM	10/21/2020	1230.3	30.9	1230.3	35.9	3890.5				
8:04 PM	10/21/2020	1202.3	30.8	1202.3	35.8	3801.9				
8:05 PM	10/21/2020	1349.0	31.3	1349.0	36.3	4265.8				
8:06 PM	10/21/2020	1174.9	30.7	1174.9	35.7	3715.4				
8:07 PM	10/21/2020	955.0	29.8	955.0	34.8	3020.0				
8:08 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:09 PM	10/21/2020	955.0	29.8	955.0	34.8	3020.0				
8:10 PM	10/21/2020	955.0	29.8	955.0	34.8	3020.0				
8:11 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:12 PM	10/21/2020	1862.1	32.7	1862.1	37.7	5888.4				
8:13 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
8:14 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
8:15 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
8:16 PM	10/21/2020	1071.5	30.3	1071.5	35.3	3388.4				
8:17 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:18 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:19 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:20 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
8:21 PM	10/21/2020	1071.5	30.3	1071.5	35.3	3388.4				
8:22 PM	10/21/2020	1412.5	31.5	1412.5	36.5	4466.8				
8:23 PM	10/21/2020	1659.6	32.2	1659.6	37.2	5248.1				
8:24 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
8:25 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
8:26 PM	10/21/2020	2884.0	34.6	2884.0	39.6	9120.1				
8:27 PM	10/21/2020	4073.8	36.1	4073.8	41.1	12882.5				

Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
6:59:00	6:59:00		36	61.6	45.9	29.3	35.9	61.6	45.8	29.3
7:00:00	7:00:00		32.9	56.8	38.1	28.8	32.9	56.9	38.1	28.7
7:01:00	7:01:00		31.2	58.5	39	28.8	31.2	58.5	39	28.7
7:02:00	7:02:00		30.2	51.8	35.1	28.8	30.1	51.8	35.1	28.7
7:03:00	7:03:00		34.7	59.9	43.9	29	34.7	59.8	43.9	29
7:04:00	7:04:00		34.7	57.1	41.6	29.4	34.7	57	41.5	29.3
7:05:00	7:05:00		30.2	57.4	36.1	29.1	30.2	57.5	36.1	29.1
7:06:00	7:06:00		31	54.2	32.8	28.9	31	53.8	32.8	28.9
7:07:00	7:07:00		32.5	54.2	37.9	29.1	32.4	54.6	37.9	29.1
7:08:00	7:08:00		31.9	51.9	36.8	29.5	31.9	51.8	36.7	29.5
7:09:00	7:09:00		30.8	48.1	36	29	30.7	48.1	35.9	29
7:10:00	7:10:00		31.9	52.1	38	29.8	31.8	52.1	38	29.8
7:11:00	7:11:00		33	50.1	39.4	30	32.9	49.9	39.4	30
7:12:00	7:12:00		31.3	55.9	33.4	29.6	31.3	55.9	33.4	29.6
7:13:00	7:13:00		30.3	52.4	34.1	29.3	30.3	52.4	34.1	29.3
7:14:00	7:14:00		30.8	51.5	33.2	29.4	30.8	50.9	33.1	29.4
7:15:00	7:15:00		30.5	59.4	35.1	29.7	30.5	59.4	35.1	29.7
7:16:00	7:16:00		30.4	63	32.8	29.2	30.4	63.1	32.8	29.2
7:17:00	7:17:00		30.7	46.8	33.6	29.4	30.6	47.3	33.6	29.4
7:18:00	7:18:00		30.1	46.6	31.8	28.9	30.1	45.9	31.8	28.9
7:19:00	7:19:00		30	48	31.4	29	30	48.1	31.4	29
7:20:00	7:20:00		29.9	49.5	31	29.2	29.9	49.5	31	29.2
7:21:00	7:21:00		30.4	66	35.2	28.9	30.4	65.9	35.2	28.8
7:22:00	7:22:00		30.4	48.4	32.8	29.2	30.3	48	32.8	29.2
7:23:00	7:23:00		30.7	54.4	32.7	29.5	30.7	54.5	32.7	29.4
7:24:00	7:24:00		30.5	56.4	32.8	29.3	30.5	56.3	32.8	29.2
7:25:00	7:25:00		31.3	48.2	32.9	30	31.2	48.6	32.9	30
7:26:00	7:26:00		34.3	60.3	43.1	30.6	34.3	60.4	43.1	30.6
7:27:00	7:27:00		32.4	54.6	41.8	29.6	32.3	54.5	41.8	29.6
7:28:00	7:28:00		33.3	56.4	40.2	29.7	33.3	56.2	40.2	29.7
7:29:00	7:29:00		31	46.7	33.2	29.9	31	46.8	33.2	29.8
7:30:00	7:30:00		32.3	52.4	34.7	30.8	32.3	52.2	34.7	30.7
7:31:00	7:31:00		34	58.1	42.2	31.6	33.9	58.1	42.2	31.5
7:32:00	7:32:00		33	48.3	35.7	31.7	33	49.2	35.6	31.6
7:33:00	7:33:00		35.5	57.7	39.6	32.8	35.4	57.9	39.6	32.8
7:34:00	7:34:00		34	53.2	35.3	32.9	34	53.2	35.3	32.9
7:35:00	7:35:00		33	51.5	37.1	31.8	33	51.8	37.1	31.7
7:36:00	7:36:00		33	50.2	36.1	31.7	32.9	50.8	36.1	31.7
7:37:00	7:37:00		34.1	50.4	35.8	32.3	34	49.6	35.8	32.2
7:38:00	7:38:00		34.2	59.4	35.1	33.3	34.1	59.5	35.1	33.2
7:39:00	7:39:00		36.6	52.2	38.3	34.3	36.6	52	38.3	34.2
7:40:00	7:40:00		37.5	55.7	38.3	36.6	37.4	55.6	38.3	36.6
7:41:00	7:41:00		37.6	51.9	38.4	36.9	37.6	52.5	38.3	36.9
7:42:00	7:42:00		37.3	52	39.3	34.6	37.2	51.7	39.3	34.5
7:43:00	7:43:00		34.5	62.7	37.6	33.5	34.4	62.6	37.6	33.4
7:44:00	7:44:00		34.9	50.2	36.6	34.1	34.9	49.5	36.6	34.1
7:45:00	7:45:00		34.6	49.1	36	34	34.6	49.2	36	34
7:46:00	7:46:00		35.3	53.9	36	34.6	35.3	54	36	34.5
7:47:00	7:47:00		35	53.5	36.5	34.1	35	53.4	36.5	34
7:48:00	7:48:00		36.7	52.4	38.2	35.3	36.7	52.8	38.2	35.3
7:49:00	7:49:00		35.7	57.1	38.5	31.7	35.7	57.2	38.5	31.7
7:50:00	7:50:00		31.9	50.2	34.1	30.9	31.9	50.2	34	30.8
7:51:00	7:51:00		30.5	47.6	31.6	29.2	30.5	46.8	31.6	29.2
7:52:00	7:52:00		30.1	57	31.7	29.3	30	56.9	31.7	29.2
7:53:00	7:53:00		30.4	48.1	32.1	29.1	30.3	48.7	32.1	29.2
7:54:00	7:54:00		31.3	51.5	34.3	29.4	31.3	51.6	34.3	29.4
7:55:00	7:55:00		32.2	48.9	35.2	30	32.1	48.4	35.3	30
7:56:00	7:56:00		29.9	44.5	31.5	29	29.9	45.1	31.5	29
7:57:00	7:57:00		30.1	47.5	31.2	29.6	30.1	47.8	31.2	29.6
7:58:00	7:58:00		30.6	45.3	32.4	29.4	30.6	45.9	32.4	29.4
7:59:00	7:59:00		30.4	51.4	32.7	28.9	30.4	51.2	32.6	28.9
8:00:00	8:00:00		30.1	45.9	32.1	29.1	30.1	45.8	32.1	29.1
8:01:00	8:01:00		31.1	55.4	32.8	29.5	31.1	55.3	32.7	29.5
8:02:00	8:02:00		33.2	49	35.7	31.1	33.2	49	35.7	31.1
8:03:00	8:03:00		32.6	48.3	34.3	30.7	32.6	48.1	34.3	30.6
8:04:00	8:04:00		31.6	52.3	34.5	29.6	31.6	51.7	34.5	29.5
8:05:00	8:05:00		29.9	51.4	31.4	29.2	29.9	51.5	31.4	29.1
8:06:00	8:06:00		35.3	55.8	43.2	30.8	35.3	55.6	43.2	30.7
8:07:00	8:07:00		36	53.2	42.6	33.7	36	53.6	42.6	33.7
8:08:00	8:08:00		36.4	56.6	42.6	34.5	36.3	56.9	42.6	34.5
8:09:00	8:09:00		35.9	51.5	38.3	34.8	35.9	51.5	38.3	34.8
8:10:00	8:10:00		34.9	50.2	36.4	33.9	34.9	50.3	36.3	33.8
8:11:00	8:11:00		35.6	50	36.2	34.4	35.6	49.8	36.2	34.4
8:12:00	8:12:00		35.5	58.5	38.2	34.4	35.5	58.5	38.2	34.3
8:13:00	8:13:00		35.8	56.2	38.7	34.8	35.7	55.7	38.7	34.8
8:14:00	8:14:00		36.6	59.4	41.1	34	36.5	59.3	41.1	34
8:15:00	8:15:00		32.7	49.3	35.8	31.1	32.7	49.2	35.7	31.1
8:16:00	8:16:00		32.3	48.2	34.2	31	32.3	47.8	34.1	31
8:17:00	8:17:00		32.9	49	34.1	32.2	32.9	49.3	34.1	32.2
8:18:00	8:18:00		33.3	50.2	34.8	31.9	33.3	49.5	34.8	31.9
8:19:00	8:19:00		34.9	55.2	38.4	32.5	34.9	55.1	38.3	32.5
8:20:00	8:20:00		37.9	56.9	40.8	35.2	37.9	56.7	40.7	35.2
8:21:00	8:21:00		38	61	40	36.6	38	61.2	40	36.6
8:22:00	8:22:00		40.2	72.5	42.9	38.1	40.2	72.5	42.9	38.1

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
8:28 PM	10/21/2020	3981.1	36.0	3981.1	41.0	12589.3				
8:29 PM	10/21/2020	1949.8	32.9	1949.8	37.9	6166.0				
8:30 PM	10/21/2020	1318.3	31.2	1318.3	36.2	4168.7				
8:31 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
8:32 PM	10/21/2020	2951.2	34.7	2951.2	39.7	9332.5				
8:33 PM	10/21/2020	2951.2	34.7	2951.2	39.7	9332.5				
8:34 PM	10/21/2020	1047.1	30.2	1047.1	35.2	3311.3				
8:35 PM	10/21/2020	1258.9	31.0	1258.9	36.0	3981.1				
8:36 PM	10/21/2020	1778.3	32.5	1778.3	37.5	5623.4				
8:37 PM	10/21/2020	1548.8	31.9	1548.8	36.9	4897.8				
8:38 PM	10/21/2020	1202.3	30.8	1202.3	35.8	3801.9				
8:39 PM	10/21/2020	1548.8	31.9	1548.8	36.9	4897.8				
8:40 PM	10/21/2020	1995.3	33.0	1995.3	38.0	6309.6				
8:41 PM	10/21/2020	1349.0	31.3	1349.0	36.3	4265.8				
8:42 PM	10/21/2020	1071.5	30.3	1071.5	35.3	3388.4				
8:43 PM	10/21/2020	1202.3	30.8	1202.3	35.8	3801.9				
8:44 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
8:45 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
8:46 PM	10/21/2020	1174.9	30.7	1174.9	35.7	3715.4				
8:47 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
8:48 PM	10/21/2020	1000.0	30.0	1000.0	35.0	3162.3				
8:49 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
8:50 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
8:51 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
8:52 PM	10/21/2020	1174.9	30.7	1174.9	35.7	3715.4				
8:53 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
8:54 PM	10/21/2020	1349.0	31.3	1349.0	36.3	4265.8				
8:55 PM	10/21/2020	2691.5	34.3	2691.5	39.3	8511.4				
8:56 PM	10/21/2020	1737.8	32.4	1737.8	37.4	5495.4				
8:57 PM	10/21/2020	2138.0	33.3	2138.0	38.3	6760.8				
8:58 PM	10/21/2020	1258.9	31.0	1258.9	36.0	3981.1				
8:59 PM	10/21/2020	1698.2	32.3	1698.2	37.3	5370.3				
9:00 PM	10/21/2020	2511.9	34.0	2511.9	39.0	7943.3				
9:01 PM	10/21/2020	1995.3	33.0	1995.3	38.0	6309.6				
9:02 PM	10/21/2020	3548.1	35.5	3548.1	40.5	11220.2				
9:03 PM	10/21/2020	2511.9	34.0	2511.9	39.0	7943.3				
9:04 PM	10/21/2020	1995.3	33.0	1995.3	38.0	6309.6				
9:05 PM	10/21/2020	1995.3	33.0	1995.3	38.0	6309.6				
9:06 PM	10/21/2020	2570.4	34.1	2570.4	39.1	8128.3				
9:07 PM	10/21/2020	2630.3	34.2	2630.3	39.2	8317.6				
9:08 PM	10/21/2020	4570.9	36.6	4570.9	41.6	14454.4				
9:09 PM	10/21/2020	5623.4	37.5	5623.4	42.5	17782.8				
9:10 PM	10/21/2020	5754.4	37.6	5754.4	42.6	18197.0				
9:11 PM	10/21/2020	5370.3	37.3	5370.3	42.3	16982.4				
9:12 PM	10/21/2020	2818.4	34.5	2818.4	39.5	8912.5				
9:13 PM	10/21/2020	3090.3	34.9	3090.3	39.9	9772.4				
9:14 PM	10/21/2020	2884.0	34.6	2884.0	39.6	9120.1				
9:15 PM	10/21/2020	3388.4	35.3	3388.4	40.3	10715.2				
9:16 PM	10/21/2020	3162.3	35.0	3162.3	40.0	10000.0				
9:17 PM	10/21/2020	4677.4	36.7	4677.4	41.7	14791.1				
9:18 PM	10/21/2020	3715.4	35.7	3715.4	40.7	11749.0				
9:19 PM	10/21/2020	1548.8	31.9	1548.8	36.9	4897.8				
9:20 PM	10/21/2020	1122.0	30.5	1122.0	35.5	3548.1				
9:21 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
9:22 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
9:23 PM	10/21/2020	1349.0	31.3	1349.0	36.3	4265.8				
9:24 PM	10/21/2020	1659.6	32.2	1659.6	37.2	5248.1				
9:25 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
9:26 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
9:27 PM	10/21/2020	1148.2	30.6	1148.2	35.6	3630.8				
9:28 PM	10/21/2020	1096.5	30.4	1096.5	35.4	3467.4				
9:29 PM	10/21/2020	1023.3	30.1	1023.3	35.1	3235.9				
9:30 PM	10/21/2020	1288.2	31.1	1288.2	36.1	4073.8				
9:31 PM	10/21/2020	2089.3	33.2	2089.3	38.2	6606.9				
9:32 PM	10/21/2020	1819.7	32.6	1819.7	37.6	5754.4				
9:33 PM	10/21/2020	1445.4	31.6	1445.4	36.6	4570.9				
9:34 PM	10/21/2020	977.2	29.9	977.2	34.9	3090.3				
9:35 PM	10/21/2020	3388.4	35.3	3388.4	40.3	10715.2				
9:36 PM	10/21/2020	3981.1	36.0	3981.1	41.0	12589.3				
9:37 PM	10/21/2020	4365.2	36.4	4365.2	41.4	13803.8				
9:38 PM	10/21/2020	3890.5	35.9	3890.5	40.9	12302.7				
9:39 PM	10/21/2020	3090.3	34.9	3090.3	39.9	9772.4				
9:40 PM	10/21/2020	3630.8	35.6	3630.8	40.6	11481.5				
9:41 PM	10/21/2020	3548.1	35.5	3548.1	40.5	11220.2				
9:42 PM	10/21/2020	3801.9	35.8	3801.9	40.8	12022.6				
9:43 PM	10/21/2020	4570.9	36.6	4570.9	41.6	14454.4				
9:44 PM	10/21/2020	1862.1	32.7	1862.1	37.7	5888.4				
9:45 PM	10/21/2020	1698.2	32.3	1698.2	37.3	5370.3				
9:46 PM	10/21/2020	1949.8	32.9	1949.8	37.9	6166.0				
9:47 PM	10/21/2020	2138.0	33.3	2138.0	38.3	6760.8				
9:48 PM	10/21/2020	3090.3	34.9	3090.3	39.9	9772.4				
9:49 PM	10/21/2020	6166.0	37.9	6166.0	42.9	19498.4				
9:50 PM	10/21/2020	6309.6	38.0	6309.6	43.0	19952.6				
9:51 PM	10/21/2020	10471.3	40.2	10471.3	45.2	33113.1				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	8:23:00	8:23:00		39.9	59.1	42	38.1	39.8	59.4	42	38.1
	8:24:00	8:24:00		39.8	57.7	41.6	37.6	39.8	57.6	41.6	37.6
	8:25:00	8:25:00		41.8	61.5	45.8	38.7	41.8	61.4	45.7	38.6
	8:26:00	8:26:00		42.4	63.7	45.4	40.3	42.4	63.7	45.3	40.3
	8:27:00	8:27:00		43.7	66.1	46.2	40.6	43.6	66.1	46.2	40.6
	8:28:00	8:28:00		43.4	63.7	46.2	41.5	43.3	63.7	46.2	41.5
	8:29:00	8:29:00		41.4	65.2	44.4	39	41.4	65.1	44.4	39
	8:30:00	8:30:00		42.1	65.4	44.4	39	42.1	65.2	44.4	39
	8:31:00	8:31:00		42.5	62.8	44.4	40.9	42.4	62.7	44.4	40.9
	8:32:00	8:32:00		42.9	61.4	45.6	40.3	42.9	61.6	45.6	40.2
	8:33:00	8:33:00		41.9	63.9	44.6	39.8	41.9	63.9	44.6	39.8
	8:34:00	8:34:00		40.1	69	44	37.4	40.1	68.9	44	37.4
	8:35:00	8:35:00		39.3	58.9	44	35.8	39.3	59.1	44	35.7
	8:36:00	8:36:00		36.5	55.5	38.9	33.8	36.5	55.3	38.9	33.8
	8:37:00	8:37:00		34	60.2	36	32.4	33.9	60.3	36	32.4
	8:38:00	8:38:00		33.1	53.8	35.1	31.9	33.1	53.7	35.1	31.8
	8:39:00	8:39:00		37.7	58.9	39.5	35.1	37.7	59.2	39.5	35.1
	8:40:00	8:40:00		35.8	56.7	38	34.8	35.8	57.1	38	34.8
	8:41:00	8:41:00		35.7	53.8	37.2	34.2	35.7	53.8	37.2	34.2
	8:42:00	8:42:00		35.4	63	38	34	35.4	62.9	38	34
	8:43:00	8:43:00		34	52.7	35.1	33	33.9	52.6	35.1	33
	8:44:00	8:44:00		34.5	65.7	42.8	33	34.5	65.6	42.8	33
	8:45:00	8:45:00		34.2	59.5	35.9	33.2	34.2	59.4	35.9	33.2
	8:46:00	8:46:00		33.8	53.8	38	32.5	33.8	53.5	38	32.5
	8:47:00	8:47:00		34.6	54.4	36.2	33.5	34.6	54.5	36.2	33.4
	8:48:00	8:48:00		34.5	51.6	35.9	33.3	34.5	51.3	35.9	33.2
	8:49:00	8:49:00		32.9	56.5	34.8	31.6	32.8	56.6	34.8	31.6
	8:50:00	8:50:00		32.4	54	33.9	30.8	32.4	54.3	33.9	30.7
	8:51:00	8:51:00		33.2	55.8	35.7	31.4	33.2	55.9	35.6	31.3
	8:52:00	8:52:00		32.9	52.8	34.2	32	32.9	53	34.2	32
	8:53:00	8:53:00		33.1	60.4	34.7	31.6	33	60.4	34.6	31.6
	8:54:00	8:54:00		32.5	51.1	34.7	31	32.4	50.5	34.7	31
	8:55:00	8:55:00		35	59.5	37	33.5	35	59.4	37	33.5
	8:56:00	8:56:00		33.9	55.1	34.7	32.9	33.9	54.9	34.7	32.9
	8:57:00	8:57:00		33.7	51.1	34.6	32.6	33.7	51.4	34.6	32.5
	8:58:00	8:58:00		34.1	51.9	35.8	33	34	51.5	35.8	33
	8:59:00	8:59:00		33.8	49.1	35.1	32.6	33.8	49.6	35.1	32.6
	9:00:00	9:00:00		34.3	51.7	35.2	33.2	34.2	51.6	35.2	33.2
	9:01:00	9:01:00		35.1	50.3	36.2	34	35	50.4	36.2	34
	9:02:00	9:02:00		32.7	53.5	34.9	30.7	32.6	53.3	34.8	30.6
	9:03:00	9:03:00		31.6	51.3	33.2	30	31.6	51.3	33.1	30
	9:04:00	9:04:00		30.4	48.9	31.3	29.6	30.4	48.9	31.2	29.6
	9:05:00	9:05:00		32.3	51.7	34.9	31	32.3	51.6	34.9	31
	9:06:00	9:06:00		32.2	49.5	33.5	30.9	32.1	49.5	33.5	30.9
	9:07:00	9:07:00		33	54.2	35.8	30.6	33	54.5	35.8	30.6
	9:08:00	9:08:00		34.5	53.3	37.4	32.4	34.4	53.4	37.4	32.4
	9:09:00	9:09:00		33	51.5	35.7	30.9	32.9	51.5	35.6	30.8
	9:10:00	9:10:00		32.6	52.5	33.6	31.3	32.5	52.6	33.6	31.3
	9:11:00	9:11:00		34.7	53.9	36.8	32.5	34.7	53.5	36.8	32.5
	9:12:00	9:12:00		33.8	57.4	36.7	31.8	33.8	57.7	36.7	31.8
	9:13:00	9:13:00		34.8	58.6	36.5	33.5	34.8	58.5	36.5	33.5
	9:14:00	9:14:00		35.8	52	37.8	34.3	35.8	51.8	37.8	34.3
	9:15:00	9:15:00		34.9	56.6	36.6	33.8	34.9	56.5	36.6	33.8
	9:16:00	9:16:00		34.1	51.9	35.1	33	34.1	52.3	35	33
	9:17:00	9:17:00		34.4	59	36.7	33.2	34.4	58.7	36.7	33.2
	9:18:00	9:18:00		34.1	54.1	35.8	33.2	34.1	54.5	35.8	33.2
	9:19:00	9:19:00		35.9	56.1	37.8	33.4	35.9	56.3	37.7	33.4
	9:20:00	9:20:00		35.4	60.3	38.3	33.8	35.4	60.4	38.2	33.8
	9:21:00	9:21:00		37.5	62.2	40.6	34.3	37.5	62	40.6	34.3
	9:22:00	9:22:00		36.9	56.9	39.4	33.5	36.9	56.9	39.3	33.4
	9:23:00	9:23:00		33.4	56.2	35.3	32.6	33.3	56	35.3	32.6
	9:24:00	9:24:00		33.4	54.8	35.2	31.8	33.3	55.1	35.2	31.7
	9:25:00	9:25:00		33.8	57.1	36	31.3	33.7	57.1	36	31.3
	9:26:00	9:26:00		34.5	59.3	36.7	32.9	34.5	59.3	36.7	32.9
	9:27:00	9:27:00		34.3	55.9	36.4	32.6	34.2	55.6	36.4	32.6
	9:28:00	9:28:00		33.6	55.2	35.4	32.4	33.6	55.3	35.4	32.4
	9:29:00	9:29:00		35.1	51.7	38.5	33.6	35.1	52.2	38.5	33.6
	9:30:00	9:30:00		38.5	61.6	41.3	36.9	38.5	61.7	41.2	36.9
	9:31:00	9:31:00		37.4	62.4	41.4	35.1	37.3	62.3	41.3	35.1
	9:32:00	9:32:00		36.7	54.1	38.3	35.4	36.7	54	38.3	35.4
	9:33:00	9:33:00		36.4	55.7	38.4	34.8	36.4	55.6	38.4	34.8
	9:34:00	9:34:00		36.7	53.9	37.7	35.5	36.7	53.9	37.6	35.5
	9:35:00	9:35:00		38.3	57.4	40.1	36.2	38.3	57.2	40.1	36.2
	9:36:00	9:36:00		38.8	61.1	41.3	36.3	38.7	61	41.3	36.2
	9:37:00	9:37:00		40.9	60.9	43.6	38.7	40.9	61.2	43.6	38.7
	9:38:00	9:38:00		39.1	60	40.4	38	39.1	60	40.4	37.9
	9:39:00	9:39:00		38.6	57.1	41.7	37.3	38.6	57.1	41.6	37.3
	9:40:00	9:40:00		41.3	69	46.3	38.4	41.3	68.9	46.2	38.4
	9:41:00	9:41:00		41.5	62.5	45.1	38.5	41.5	62.7	45.1	38.5
	9:42:00	9:42:00		40.8	62.8	42.8	39	40.8	62.8	42.7	38.9
	9:43:00	9:43:00		39.2	65.2	41.1	37.7	39.1	65.1	41.1	37.7
	9:44:00	9:44:00		39.4	58	42.2	36.7	39.4	58.3	42.1	36.7
	9:45:00	9:45:00		40.9	57.1	42.1	39	40.8	57	42.1	39
	9:46:00	9:46:00		41.6	66.7	47.8	38.7	41.6	66.6	47.8	38.7

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
9:52 PM	10/21/2020	9772.4	39.9	9772.4	44.9	30903.0				
9:53 PM	10/21/2020	9549.9	39.8	9549.9	44.8	30199.5				
9:54 PM	10/21/2020	15135.6	41.8	15135.6	46.8	47863.0				
9:55 PM	10/21/2020	17378.0	42.4	17378.0	47.4	54954.1				
9:56 PM	10/21/2020	23442.3	43.7	23442.3	48.7	74131.0				
9:57 PM	10/21/2020	21877.6	43.4	21877.6	48.4	69183.1				
9:58 PM	10/21/2020	13803.8	41.4	13803.8	46.4	43651.6				
9:59 PM	10/21/2020	16218.1	42.1	16218.1	47.1	51286.1				
10:00 PM	10/21/2020	17782.8	52.5	177827.9	52.5	177827.9				
10:01 PM	10/21/2020	19498.4	52.9	194984.5	52.9	194984.5				
10:02 PM	10/21/2020	15488.2	51.9	154881.7	51.9	154881.7				
10:03 PM	10/21/2020	10232.9	50.1	102329.3	50.1	102329.3				
10:04 PM	10/21/2020	8511.4	49.3	85113.8	49.3	85113.8				
10:05 PM	10/21/2020	4466.8	46.5	44668.4	46.5	44668.4				
10:06 PM	10/21/2020	2511.9	44.0	25118.9	44.0	25118.9				
10:07 PM	10/21/2020	2041.7	43.1	20417.4	43.1	20417.4				
10:08 PM	10/21/2020	5888.4	47.7	58884.4	47.7	58884.4				
10:09 PM	10/21/2020	3801.9	45.8	38018.9	45.8	38018.9				
10:10 PM	10/21/2020	3715.4	45.7	37153.5	45.7	37153.5				
10:11 PM	10/21/2020	3467.4	45.4	34673.7	45.4	34673.7				
10:12 PM	10/21/2020	2511.9	44.0	25118.9	44.0	25118.9				
10:13 PM	10/21/2020	2818.4	44.5	28183.8	44.5	28183.8				
10:14 PM	10/21/2020	2630.3	44.2	26302.7	44.2	26302.7				
10:15 PM	10/21/2020	2398.8	43.8	23988.3	43.8	23988.3				
10:16 PM	10/21/2020	2884.0	44.6	28840.3	44.6	28840.3				
10:17 PM	10/21/2020	2818.4	44.5	28183.8	44.5	28183.8				
10:18 PM	10/21/2020	1949.8	42.9	19498.4	42.9	19498.4				
10:19 PM	10/21/2020	1737.8	42.4	17378.0	42.4	17378.0				
10:20 PM	10/21/2020	2089.3	43.2	20893.0	43.2	20893.0				
10:21 PM	10/21/2020	1949.8	42.9	19498.4	42.9	19498.4				
10:22 PM	10/21/2020	2041.7	43.1	20417.4	43.1	20417.4				
10:23 PM	10/21/2020	1778.3	42.5	17782.8	42.5	17782.8				
10:24 PM	10/21/2020	3162.3	45.0	31622.8	45.0	31622.8				
10:25 PM	10/21/2020	2454.7	43.9	24547.1	43.9	24547.1				
10:26 PM	10/21/2020	2344.2	43.7	23442.3	43.7	23442.3				
10:27 PM	10/21/2020	2570.4	44.1	25704.0	44.1	25704.0				
10:28 PM	10/21/2020	2398.8	43.8	23988.3	43.8	23988.3				
10:29 PM	10/21/2020	2691.5	44.3	26915.3	44.3	26915.3				
10:30 PM	10/21/2020	3235.9	45.1	32359.4	45.1	32359.4				
10:31 PM	10/21/2020	1862.1	42.7	18620.9	42.7	18620.9				
10:32 PM	10/21/2020	1445.4	41.6	14454.4	41.6	14454.4				
10:33 PM	10/21/2020	1096.5	40.4	10964.8	40.4	10964.8				
10:34 PM	10/21/2020	1698.2	42.3	16982.4	42.3	16982.4				
10:35 PM	10/21/2020	1659.6	42.2	16595.9	42.2	16595.9				
10:36 PM	10/21/2020	1995.3	43.0	19952.6	43.0	19952.6				
10:37 PM	10/21/2020	2818.4	44.5	28183.8	44.5	28183.8				
10:38 PM	10/21/2020	1995.3	43.0	19952.6	43.0	19952.6				
10:39 PM	10/21/2020	1819.7	42.6	18197.0	42.6	18197.0				
10:40 PM	10/21/2020	2951.2	44.7	29512.1	44.7	29512.1				
10:41 PM	10/21/2020	2398.8	43.8	23988.3	43.8	23988.3				
10:42 PM	10/21/2020	3020.0	44.8	30199.5	44.8	30199.5				
10:43 PM	10/21/2020	3801.9	45.8	38018.9	45.8	38018.9				
10:44 PM	10/21/2020	3090.3	44.9	30903.0	44.9	30903.0				
10:45 PM	10/21/2020	2570.4	44.1	25704.0	44.1	25704.0				
10:46 PM	10/21/2020	2754.2	44.4	27542.3	44.4	27542.3				
10:47 PM	10/21/2020	2570.4	44.1	25704.0	44.1	25704.0				
10:48 PM	10/21/2020	3890.5	45.9	38904.5	45.9	38904.5				
10:49 PM	10/21/2020	3467.4	45.4	34673.7	45.4	34673.7				
10:50 PM	10/21/2020	5623.4	47.5	56234.1	47.5	56234.1				
10:51 PM	10/21/2020	4897.8	46.9	48977.9	46.9	48977.9				
10:52 PM	10/21/2020	2187.8	43.4	21877.6	43.4	21877.6				
10:53 PM	10/21/2020	2187.8	43.4	21877.6	43.4	21877.6				
10:54 PM	10/21/2020	2398.8	43.8	23988.3	43.8	23988.3				
10:55 PM	10/21/2020	2818.4	44.5	28183.8	44.5	28183.8				
10:56 PM	10/21/2020	2691.5	44.3	26915.3	44.3	26915.3				
10:57 PM	10/21/2020	2290.9	43.6	22908.7	43.6	22908.7				
10:58 PM	10/21/2020	3235.9	45.1	32359.4	45.1	32359.4				
10:59 PM	10/21/2020	7079.5	48.5	70794.6	48.5	70794.6				
11:00 PM	10/21/2020	5495.4	47.4	54954.1	47.4	54954.1				
11:01 PM	10/21/2020	4677.4	46.7	46773.5	46.7	46773.5				
11:02 PM	10/21/2020	4365.2	46.4	43651.6	46.4	43651.6				
11:03 PM	10/21/2020	4677.4	46.7	46773.5	46.7	46773.5				
11:04 PM	10/21/2020	6760.8	48.3	67608.3	48.3	67608.3				
11:05 PM	10/21/2020	7585.8	48.8	75857.8	48.8	75857.8				
11:06 PM	10/21/2020	12302.7	50.9	123026.9	50.9	123026.9				
11:07 PM	10/21/2020	8128.3	49.1	81283.1	49.1	81283.1				
11:08 PM	10/21/2020	7244.4	48.6	72443.6	48.6	72443.6				
11:09 PM	10/21/2020	13489.6	51.3	134896.3	51.3	134896.3				
11:10 PM	10/21/2020	14125.4	51.5	141253.8	51.5	141253.8				
11:11 PM	10/21/2020	12022.6	50.8	120226.4	50.8	120226.4				
11:12 PM	10/21/2020	8317.6	49.2	83176.4	49.2	83176.4				
11:13 PM	10/21/2020	8709.6	49.4	87096.4	49.4	87096.4				
11:14 PM	10/21/2020	12302.7	50.9	123026.9	50.9	123026.9				
11:15 PM	10/21/2020	14454.4	51.6	144544.0	51.6	144544.0				

Study Time	Study Time	Session Status	OL	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
9:47:00	9:47:00			42.8	66.4	44.7	40	42.8	66.2	44.6	40
9:48:00	9:48:00			42.7	64.9	46.8	38.5	42.7	64.8	46.7	38.5
9:49:00	9:49:00			42.4	61.4	45.3	40.7	42.4	61.2	45.2	40.7
9:50:00	9:50:00			42.8	71.2	45.9	39.3	42.7	71.2	45.8	39.2
9:51:00	9:51:00			41.7	64.3	43.8	38.9	41.7	64.3	43.7	38.9
9:52:00	9:52:00			41.5	58.4	43.6	39.4	41.4	57.8	43.6	39.4
9:53:00	9:53:00			44.7	67.9	47.6	41.4	44.7	67.9	47.6	41.4
9:54:00	9:54:00			45.1	82	51.7	40.9	45.1	82	51.7	40.8
9:55:00	9:55:00			43.7	65.8	48.7	41.1	43.7	65.7	48.7	41.1
9:56:00	9:56:00			42	64.7	44.5	40	42	64.5	44.5	39.9
9:57:00	9:57:00			40.7	61.2	42.9	38.7	40.7	61.1	42.9	38.7
9:58:00	9:58:00			44.5	63.5	48	41.9	44.5	63.6	48	41.9
9:59:00	9:59:00			44.5	62.2	47.2	42.3	44.4	62.2	47.2	42.2
10:00:00	10:00:00			43.7	62.4	47.7	40.1	43.7	62.3	47.7	40.1
10:01:00	10:01:00			41.1	62.8	44	38.8	41	62.7	44	38.8
10:02:00	10:02:00			40.7	64.4	42.6	38.5	40.6	64.3	42.5	38.4
10:03:00	10:03:00			40.8	62.4	42.8	37.5	40.8	62.5	42.7	37.5
10:04:00	10:04:00			40.8	61.2	45.1	38.2	40.8	61.2	45.1	38.2
10:05:00	10:05:00			45.8	67.5	48.8	40.2	45.8	67.6	48.8	40.2
10:06:00	10:06:00			43.4	68.5	46.6	40.2	43.4	68.7	46.6	40.2
10:07:00	10:07:00			41.1	58.5	43.3	39	41	58.5	43.3	39
10:08:00	10:08:00			42.9	61	44.9	40.8	42.9	60.9	44.8	40.8
10:09:00	10:09:00			42.6	62.2	45.7	39.1	42.6	62	45.7	39.1
10:10:00	10:10:00			44	67.3	46.7	41.5	44	67.3	46.7	41.5
10:11:00	10:11:00			41.6	66.1	43.5	40.3	41.5	66.2	43.4	40.3
10:12:00	10:12:00			40.2	57.4	42.4	39.1	40.2	57.2	42.4	39.1
10:13:00	10:13:00			41.5	59.8	44.5	38.4	41.5	59.5	44.5	38.4
10:14:00	10:14:00			42.6	61.1	46.1	38.8	42.6	61.1	46.1	38.7
10:15:00	10:15:00			41.8	63.6	45.9	36.8	41.7	63.7	45.9	36.8
10:16:00	10:16:00			40.5	59	44.1	38	40.5	59	44	38
10:17:00	10:17:00			41	64.4	44.6	38	41	64.4	44.6	37.9
10:18:00	10:18:00			40	62.2	44.1	38.3	40	62.3	44.1	38.3
10:19:00	10:19:00			42.7	63.6	44.2	39.8	42.7	63.6	44.2	39.8
10:20:00	10:20:00			42.7	63.1	47.8	38.9	42.7	62.9	47.8	38.9
10:21:00	10:21:00			42.3	63	47.3	37.7	42.2	62.8	47.3	37.7
10:22:00	10:22:00			44.4	63.6	48.3	39.3	44.4	63.6	48.2	39.2
10:23:00	10:23:00			39.2	59.1	42	37.9	39.1	59.1	42	37.9
10:24:00	10:24:00			42.2	61.9	45.6	40.2	42.2	61.9	45.5	40.1
10:25:00	10:25:00			41.6	71.9	47.4	36.3	41.5	71.8	47.4	36.3
10:26:00	10:26:00			42.6	64.9	45.8	36.9	42.6	64.9	45.8	36.9
10:27:00	10:27:00			42.3	64.1	43.8	39.5	42.3	64.3	43.7	39.5
10:28:00	10:28:00			40.1	59.4	44.1	36.9	40.1	59.4	44.1	36.9
10:29:00	10:29:00			40.9	62.1	43.3	38	40.9	62.1	43.3	38
10:30:00	10:30:00			42.6	59.9	44.4	40.8	42.5	59.9	44.4	40.7
10:31:00	10:31:00			41.3	61.9	44.1	38.1	41.3	61.9	44.1	38
10:32:00	10:32:00			41.2	77.8	48	37.5	41.2	77.8	48	37.5
10:33:00	10:33:00			39.6	58.7	41.5	37.1	39.6	58.7	41.5	37.1
10:34:00	10:34:00			37.8	63.5	39.6	36	37.8	63.4	39.6	36
10:35:00	10:35:00			36.5	57.7	41.1	33.8	36.5	57.6	41.1	33.8
10:36:00	10:36:00			40.1	61.7	42.3	37.2	40.1	61.6	42.3	37.2
10:37:00	10:37:00			37.6	55.3	40.3	34.5	37.6	55.4	40.2	34.5
10:38:00	10:38:00			38.7	65.8	40.5	36.8	38.7	65.7	40.5	36.8
10:39:00	10:39:00			39	58	41.4	36	39	57.8	41.3	36
10:40:00	10:40:00			38.3	57.6	40.2	35.7	38.3	57.5	40.2	35.7
10:41:00	10:41:00			39.3	64.3	42.2	35	39.3	64	42.2	35
10:42:00	10:42:00			39	57.7	42	35.2	39	57.7	42	35.1
10:43:00	10:43:00			37.8	65.6	40.6	35.6	37.7	65.7	40.6	35.6
10:44:00	10:44:00			36.5	54.5	38.9	34.8	36.5	54.4	38.9	34.8
10:45:00	10:45:00			38.8	56.7	41.2	36.2	38.8	56.6	41.2	36.2
10:46:00	10:46:00			36.8	58	38.6	35.2	36.8	58.1	38.6	35.2
10:47:00	10:47:00			37.6	58.4	42	33.6	37.6	58.3	42	33.6
10:48:00	10:48:00			38.2	58.7	41.1	36.2	38.2	58.9	41.1	36.1
10:49:00	10:49:00			40.3	60.8	43.7	36.1	40.2	60.8	43.7	36.1
10:50:00	10:50:00			38	63.8	40.8	36	38	63.9	40.8	35.9
10:51:00	10:51:00			37.4	61.8	38.9	36.2	37.4	61.7	38.9	36.2
10:52:00	10:52:00			40.2	66.8	43.6	36.4	40.2	66.8	43.5	36.3
10:53:00	10:53:00			40.6	60.7	42.7	39.1	40.6	60.6	42.7	39.1
10:54:00	10:54:00			41.6	63	44	39.6	41.6	62.9	44	39.6
10:55:00	10:55:00			41.5	62.2	43.9	38.3	41.4	62	43.9	38.3
10:56:00	10:56:00			41.1	58.9	43.1	37.7	41.1	58.5	43.1	37.7
10:57:00	10:57:00			39.7	59.9	42.1	37.7	39.7	59.9	42.1	37.7
10:58:00	10:58:00			37.9	63.2	40.7	35.5	37.9	63.1	40.7	35.5
10:59:00	10:59:00			36.3	59.3	38	34.3	36.3	59.2	37.9	34.3
11:00:00	11:00:00			36.7	57.6	39.6	35	36.7	57.7	39.6	35
11:01:00	11:01:00			38.8	64	42.4	35.9	38.8	64	42.4	35.9
11:02:00	11:02:00			37.5	62.4	40.6	35.4	37.5	62.5	40.6	35.4
11:03:00	11:03:00			39	58.5	40.5	36.2	39	58.5	40.5	36.2
11:04:00	11:04:00			38.6	59.7	40.8	36.2	38.6	59.7	40.8	36.2
11:05:00	11:05:00			37.3	60.8	40.1	34.3	37.3	60.9	40.1	34.3
11:06:00	11:06:00			39	61.9	42.3	34.9	39	61.8	42.2	34.9
11:07:00	11:07:00			39.3	60.6	42.9	36.1	39.3	60.5	42.9	36.1
11:08:00	11:08:00			37.2	57.5	38.7	34.6	37.2	57.7	38.7	34.5
11:09:00	11:09:00			36.4	58.6	39.1	34.3	36.4	58.9	39.1	34.3
11:10:00	11:10:00			39.1	60	43.1	34.2	39.1	60	43.1	34.2

Time	Date	24-Hour Data $L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	15-Minute Data Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
11:16 PM	10/21/2020	19054.6	52.8	190546.1	52.8	190546.1				
11:17 PM	10/21/2020	18620.9	52.7	186208.7	52.7	186208.7				
11:18 PM	10/21/2020	17378.0	52.4	173780.1	52.4	173780.1				
11:19 PM	10/21/2020	19054.6	52.8	190546.1	52.8	190546.1				
11:20 PM	10/21/2020	14791.1	51.7	147910.8	51.7	147910.8				
11:21 PM	10/21/2020	14125.4	51.5	141253.8	51.5	141253.8				
11:22 PM	10/21/2020	29512.1	54.7	295120.9	54.7	295120.9				
11:23 PM	10/21/2020	32359.4	55.1	323593.7	55.1	323593.7				
11:24 PM	10/21/2020	23442.3	53.7	234422.9	53.7	234422.9				
11:25 PM	10/21/2020	15848.9	52.0	158489.3	52.0	158489.3				
11:26 PM	10/21/2020	11749.0	50.7	117489.8	50.7	117489.8				
11:27 PM	10/21/2020	28183.8	54.5	281838.3	54.5	281838.3				
11:28 PM	10/21/2020	28183.8	54.5	281838.3	54.5	281838.3				
11:29 PM	10/21/2020	23442.3	53.7	234422.9	53.7	234422.9				
11:30 PM	10/21/2020	12882.5	51.1	128825.0	51.1	128825.0				
11:31 PM	10/21/2020	11749.0	50.7	117489.8	50.7	117489.8				
11:32 PM	10/21/2020	12022.6	50.8	120226.4	50.8	120226.4				
11:33 PM	10/21/2020	12022.6	50.8	120226.4	50.8	120226.4				
11:34 PM	10/21/2020	38018.9	55.8	380189.4	55.8	380189.4				
11:35 PM	10/21/2020	21877.6	53.4	218776.2	53.4	218776.2				
11:36 PM	10/21/2020	12882.5	51.1	128825.0	51.1	128825.0				
11:37 PM	10/21/2020	19498.4	52.9	194984.5	52.9	194984.5				
11:38 PM	10/21/2020	18197.0	52.6	181970.1	52.6	181970.1				
11:39 PM	10/21/2020	25118.9	54.0	251188.6	54.0	251188.6				
11:40 PM	10/21/2020	14454.4	51.6	144544.0	51.6	144544.0				
11:41 PM	10/21/2020	10471.3	50.2	104712.9	50.2	104712.9				
11:42 PM	10/21/2020	14125.4	51.5	141253.8	51.5	141253.8				
11:43 PM	10/21/2020	18197.0	52.6	181970.1	52.6	181970.1				
11:44 PM	10/21/2020	15135.6	51.8	151356.1	51.8	151356.1				
11:45 PM	10/21/2020	11220.2	50.5	112201.8	50.5	112201.8				
11:46 PM	10/21/2020	12589.3	51.0	125892.5	51.0	125892.5				
11:47 PM	10/21/2020	10000.0	50.0	100000.0	50.0	100000.0				
11:48 PM	10/21/2020	18620.9	52.7	186208.7	52.7	186208.7				
11:49 PM	10/21/2020	18620.9	52.7	186208.7	52.7	186208.7				
11:50 PM	10/21/2020	16982.4	52.3	169824.4	52.3	169824.4				
11:51 PM	10/21/2020	27542.3	54.4	275422.9	54.4	275422.9				
11:52 PM	10/21/2020	8317.6	49.2	83176.4	49.2	83176.4				
11:53 PM	10/21/2020	16595.9	52.2	165958.7	52.2	165958.7				
11:54 PM	10/21/2020	14454.4	51.6	144544.0	51.6	144544.0				
11:55 PM	10/21/2020	18197.0	52.6	181970.1	52.6	181970.1				
11:56 PM	10/21/2020	16982.4	52.3	169824.4	52.3	169824.4				
11:57 PM	10/21/2020	10232.9	50.1	102329.3	50.1	102329.3				
11:58 PM	10/21/2020	12302.7	50.9	123026.9	50.9	123026.9				
11:59 PM	10/21/2020	18197.0	52.6	181970.1	52.6	181970.1				
12:00 AM	10/22/2020	13489.6	51.3	134896.3	51.3	134896.3				
12:01 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
12:02 AM	10/22/2020	9120.1	49.6	91201.1	49.6	91201.1				
12:03 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
12:04 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
12:05 AM	10/22/2020	10232.9	50.1	102329.3	50.1	102329.3				
12:06 AM	10/22/2020	5754.4	47.6	57544.0	47.6	57544.0				
12:07 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
12:08 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
12:09 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
12:10 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
12:11 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
12:12 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
12:13 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
12:14 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
12:15 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
12:16 AM	10/22/2020	5754.4	47.6	57544.0	47.6	57544.0				
12:17 AM	10/22/2020	6606.9	48.2	66069.3	48.2	66069.3				
12:18 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
12:19 AM	10/22/2020	6309.6	48.0	63095.7	48.0	63095.7				
12:20 AM	10/22/2020	5495.4	47.4	54954.1	47.4	54954.1				
12:21 AM	10/22/2020	10471.3	50.2	104712.9	50.2	104712.9				
12:22 AM	10/22/2020	11481.5	50.6	114815.4	50.6	114815.4				
12:23 AM	10/22/2020	14454.4	51.6	144544.0	51.6	144544.0				
12:24 AM	10/22/2020	14125.4	51.5	141253.8	51.5	141253.8				
12:25 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
12:26 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
12:27 AM	10/22/2020	6166.0	47.9	61659.5	47.9	61659.5				
12:28 AM	10/22/2020	4265.8	46.3	42658.0	46.3	42658.0				
12:29 AM	10/22/2020	4677.4	46.7	46773.5	46.7	46773.5				
12:30 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
12:31 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
12:32 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
12:33 AM	10/22/2020	7244.4	48.6	72443.6	48.6	72443.6				
12:34 AM	10/22/2020	5370.3	47.3	53703.2	47.3	53703.2				
12:35 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
12:36 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
12:37 AM	10/22/2020	5248.1	47.2	52480.7	47.2	52480.7				
12:38 AM	10/22/2020	4365.2	46.4	43651.6	46.4	43651.6				
12:39 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	11:11:00	11:11:00		37.5	59.6	42.6	34.6	37.5	59.6	42.6	34.6
	11:12:00	11:12:00		38.8	61.1	40.9	36.2	38.7	61	40.9	36.2
	11:13:00	11:13:00		38.2	63	40.6	35.1	38.2	63.1	40.5	35.1
	11:14:00	11:14:00		39	57.2	42	36.3	39	56.8	42	36.3
	11:15:00	11:15:00		37.9	77.1	46.9	33.4	37.9	77.1	46.9	33.4
	11:16:00	11:16:00		34.3	61	37.1	32.8	34.3	60.9	37	32.7
	11:17:00	11:17:00		35	53.4	36.4	33.6	34.9	52.9	36.4	33.6
	11:18:00	11:18:00		36.6	59	38.6	34.3	36.5	58.9	38.6	34.3
	11:19:00	11:19:00		38.3	58.2	41	35.2	38.3	57.8	41	35.2
	11:20:00	11:20:00		38.7	58.5	41.9	35.5	38.6	58.3	41.9	35.4
	11:21:00	11:21:00		37.5	54.8	38.9	36.2	37.5	55	38.9	36.2
	11:22:00	11:22:00		37	57	39.7	34.7	37	57.2	39.7	34.6
	11:23:00	11:23:00		38	55.3	40.4	35	38	55.2	40.4	35
	11:24:00	11:24:00		37.5	55.2	39.8	35.2	37.4	55.2	39.8	35.2
	11:25:00	11:25:00		37	55.7	39.6	35.5	37	55.9	39.6	35.5
	11:26:00	11:26:00		38.9	59.2	41.6	36.6	38.8	59	41.6	36.6
	11:27:00	11:27:00		36.5	58.6	37.6	35.6	36.5	59.1	37.5	35.5
	11:28:00	11:28:00		35.8	62.5	41.7	32.5	35.8	62.6	41.7	32.5
	11:29:00	11:29:00		36.8	58.5	40.6	33.7	36.8	58.6	40.6	33.7
	11:30:00	11:30:00		35.5	54.5	38.9	33.3	35.5	54.3	38.9	33.2
	11:31:00	11:31:00		36.8	59.8	39.4	34.2	36.8	60	39.4	34.2
	11:32:00	11:32:00		36.5	57.3	39.1	34.1	36.5	57.4	39.1	34
	11:33:00	11:33:00		37.8	55.9	40.9	34.5	37.7	55.8	40.9	34.5
	11:34:00	11:34:00		37.7	57.7	40	35.5	37.7	57.6	40	35.5
	11:35:00	11:35:00		39	58.6	40.4	37.6	39	58.6	40.3	37.6
	11:36:00	11:36:00		38.9	59.1	41.1	36.8	38.9	58.8	41.1	36.7
	11:37:00	11:37:00		38.3	58.8	40.9	36	38.2	58.8	40.9	36
	11:38:00	11:38:00		40.6	58.2	43.1	38.1	40.5	58	43.1	38
	11:39:00	11:39:00		38.5	58.2	40.3	36.4	38.4	58.4	40.2	36.4
	11:40:00	11:40:00		39.4	57.5	42.4	37.6	39.4	57.8	42.3	37.6
	11:41:00	11:41:00		39.1	59.1	42	36.5	39	59.2	42	36.4
	11:42:00	11:42:00		38	62	44.1	35.4	38	62.2	44.1	35.4
	11:43:00	11:43:00		40.9	65.5	48.8	36.5	40.9	65.5	48.7	36.4
	11:44:00	11:44:00		37.8	54.3	40	36.4	37.8	54.6	40	36.4
	11:45:00	11:45:00		39	56.5	41	37	39	56.5	40.9	37
	11:46:00	11:46:00		41.7	60.3	44.2	39.4	41.7	60.3	44.2	39.4
	11:47:00	11:47:00		41.3	58.7	42.7	39.2	41.3	58.7	42.7	39.2
	11:48:00	11:48:00		41.4	60.1	43.5	38.1	41.4	60.1	43.5	38
	11:49:00	11:49:00		41.4	61.3	45.3	37.8	41.4	61	45.3	37.8
	11:50:00	11:50:00		40.4	58.4	42.1	38	40.4	58.3	42	38
	11:51:00	11:51:00		41	60.3	43.5	39.4	41	60.4	43.5	39.4
	11:52:00	11:52:00		44	71.6	47.3	41	44	71.7	47.3	41
	11:53:00	11:53:00		38.7	58.2	41.7	36.7	38.7	58.2	41.6	36.7
	11:54:00	11:54:00		40.3	58.6	43.5	37.4	40.3	58.4	43.4	37.4
	11:55:00	11:55:00		38.7	61.8	41.6	36.5	38.7	61.8	41.6	36.5
	11:56:00	11:56:00		39.2	57.8	41.9	35.6	39.1	57.6	41.9	35.6
	11:57:00	11:57:00		36.6	66.5	40.9	34.3	36.6	66.5	40.9	34.3
	11:58:00	11:58:00		36.3	54.9	39.9	34.4	36.3	54.7	39.9	34.4
	11:59:00	11:59:00		38.3	64.6	40.7	34.3	38.3	64.7	40.6	34.3
	12:00:00	12:00:00		37	63.9	39.5	34.5	37	64	39.5	34.5
	12:01:00	12:01:00		34.8	59.5	36.7	33	34.7	59.5	36.7	33
	12:02:00	12:02:00		38.8	58.6	41.5	36.3	38.7	58.2	41.5	36.3
	12:03:00	12:03:00		42.5	64.6	45.6	38.3	42.5	64.6	45.5	38.3
	12:04:00	12:04:00		37.2	55.9	40.6	35	37.2	56.5	40.6	35
	12:05:00	12:05:00		37.4	59.8	41.1	35.7	37.3	59.6	41.1	35.7
	12:06:00	12:06:00		38.3	56.4	40.8	35.7	38.3	56.6	40.8	35.7
	12:07:00	12:07:00		38.4	61.5	41.1	35.5	38.4	61.7	41	35.5
	12:08:00	12:08:00		39.4	59.5	41.3	37.8	39.4	59.4	41.3	37.8
	12:09:00	12:09:00		38	58.9	39.6	35.6	37.9	58.9	39.6	35.5
	12:10:00	12:10:00		37	61.6	39.6	34.9	36.9	61.5	39.5	34.9
	12:11:00	12:11:00		39.8	62.1	42.5	36.6	39.8	62.1	42.5	36.5
	12:12:00	12:12:00		40.8	62	42.8	38.8	40.8	61.8	42.7	38.8
	12:13:00	12:13:00		43.5	65.1	46.6	39.7	43.5	65.2	46.6	39.7
	12:14:00	12:14:00		42	60	44.2	39.7	42	59.8	44.1	39.7
	12:15:00	12:15:00		41.2	61.6	44.3	38.9	41.1	61.5	44.3	38.9
	12:16:00	12:16:00		39.7	59.3	43.8	37.4	39.7	59.5	43.8	37.4
	12:17:00	12:17:00		39.1	58.9	40.8	37.5	39.1	58.8	40.8	37.5
	12:18:00	12:18:00		38.1	54.9	39.9	36.7	38.1	55.2	39.8	36.7
	12:19:00	12:19:00		38.8	58	40.7	36.1	38.7	57.7	40.7	36.1
	12:20:00	12:20:00		38.1	60.5	42.1	35.3	38	60.4	42.1	35.3
	12:21:00	12:21:00		39.2	59	42.3	35.1	39.2	58.4	42.3	35.1
	12:22:00	12:22:00		35.5	56.4	37.8	32.8	35.5	56.2	37.7	32.8
	12:23:00	12:23:00		36.7	56.2	38.3	35.2	36.6	56	38.3	35.1
	12:24:00	12:24:00		35	56.2	36.7	33.3	35	56	36.7	33.3
	12:25:00	12:25:00		34.5	58	36.1	33.3	34.5	58.1	36.1	33.3
	12:26:00	12:26:00		36.5	56.7	39.1	34	36.5	56.7	39	33.9
	12:27:00	12:27:00		36	57.1	39.2	33.7	35.9	56.9	39.1	33.7
	12:28:00	12:28:00		37.3	61.5	39.8	33.5	37.3	61.3	39.8	33.4
	12:29:00	12:29:00		36.2	59.5	39.9	33.6	36.2	59.4	39.9	33.6
	12:30:00	12:30:00		35.1	60.7	38.3	31.9	35	60.5	38.3	31.9
	12:31:00	12:31:00		34.8	63	37.1	31.8	34.8	63	37	31.8
	12:32:00	12:32:00		34.8	62.1	38	31.8	34.8	62.2	38	31.8
	12:33:00	12:33:00		35.4	60	40.6	31.7	35.4	59.9	40.6	31.7
	12:34:00	12:34:00		33.5	52.7	36.4	31.5	33.5	53	36.3	31.5

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
12:40 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
12:41 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
12:42 AM	10/22/2020	6606.9	48.2	66069.3	48.2	66069.3				
12:43 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
12:44 AM	10/22/2020	6166.0	47.9	61659.5	47.9	61659.5				
12:45 AM	10/22/2020	2691.5	44.3	26915.3	44.3	26915.3				
12:46 AM	10/22/2020	3162.3	45.0	31622.8	45.0	31622.8				
12:47 AM	10/22/2020	4570.9	46.6	45708.8	46.6	45708.8				
12:48 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
12:49 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
12:50 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
12:51 AM	10/22/2020	5011.9	47.0	50118.7	47.0	50118.7				
12:52 AM	10/22/2020	6309.6	48.0	63095.7	48.0	63095.7				
12:53 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
12:54 AM	10/22/2020	5011.9	47.0	50118.7	47.0	50118.7				
12:55 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
12:56 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
12:57 AM	10/22/2020	3801.9	45.8	38018.9	45.8	38018.9				
12:58 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
12:59 AM	10/22/2020	3548.1	45.5	35481.3	45.5	35481.3				
1:00 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
1:01 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
1:02 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
1:03 AM	10/22/2020	5888.4	47.7	58884.4	47.7	58884.4				
1:04 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
1:05 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
1:06 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
1:07 AM	10/22/2020	11481.5	50.6	114815.4	50.6	114815.4				
1:08 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
1:09 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
1:10 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
1:11 AM	10/22/2020	6309.6	48.0	63095.7	48.0	63095.7				
1:12 AM	10/22/2020	12302.7	50.9	123026.9	50.9	123026.9				
1:13 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
1:14 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
1:15 AM	10/22/2020	14791.1	51.7	147910.8	51.7	147910.8				
1:16 AM	10/22/2020	13489.6	51.3	134896.3	51.3	134896.3				
1:17 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
1:18 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
1:19 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
1:20 AM	10/22/2020	12589.3	51.0	125892.5	51.0	125892.5				
1:21 AM	10/22/2020	25118.9	54.0	251188.6	54.0	251188.6				
1:22 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
1:23 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
1:24 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
1:25 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
1:26 AM	10/22/2020	4570.9	46.6	45708.8	46.6	45708.8				
1:27 AM	10/22/2020	4265.8	46.3	42658.0	46.3	42658.0				
1:28 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
1:29 AM	10/22/2020	5011.9	47.0	50118.7	47.0	50118.7				
1:30 AM	10/22/2020	3020.0	44.8	30199.5	44.8	30199.5				
1:31 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
1:32 AM	10/22/2020	17782.8	52.5	177827.9	52.5	177827.9				
1:33 AM	10/22/2020	5248.1	47.2	52480.7	47.2	52480.7				
1:34 AM	10/22/2020	5495.4	47.4	54954.1	47.4	54954.1				
1:35 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
1:36 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
1:37 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
1:38 AM	10/22/2020	6309.6	48.0	63095.7	48.0	63095.7				
1:39 AM	10/22/2020	5011.9	47.0	50118.7	47.0	50118.7				
1:40 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
1:41 AM	10/22/2020	12022.6	50.8	120226.4	50.8	120226.4				
1:42 AM	10/22/2020	22387.2	53.5	223872.1	53.5	223872.1				
1:43 AM	10/22/2020	15848.9	52.0	158489.3	52.0	158489.3				
1:44 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
1:45 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
1:46 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
1:47 AM	10/22/2020	6456.5	48.1	64565.4	48.1	64565.4				
1:48 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
1:49 AM	10/22/2020	6456.5	48.1	64565.4	48.1	64565.4				
1:50 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
1:51 AM	10/22/2020	3548.1	45.5	35481.3	45.5	35481.3				
1:52 AM	10/22/2020	4677.4	46.7	46773.5	46.7	46773.5				
1:53 AM	10/22/2020	3162.3	45.0	31622.8	45.0	31622.8				
1:54 AM	10/22/2020	2818.4	44.5	28183.8	44.5	28183.8				
1:55 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
1:56 AM	10/22/2020	3981.1	46.0	39810.7	46.0	39810.7				
1:57 AM	10/22/2020	5370.3	47.3	53703.2	47.3	53703.2				
1:58 AM	10/22/2020	4168.7	46.2	41686.9	46.2	41686.9				
1:59 AM	10/22/2020	3235.9	45.1	32359.4	45.1	32359.4				
2:00 AM	10/22/2020	3020.0	44.8	30199.5	44.8	30199.5				
2:01 AM	10/22/2020	3020.0	44.8	30199.5	44.8	30199.5				
2:02 AM	10/22/2020	3467.4	45.4	34673.7	45.4	34673.7				
2:03 AM	10/22/2020	2238.7	43.5	22387.2	43.5	22387.2				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	12:35:00	12:35:00		32.5	59.7	34.7	31	32.5	59.4	34.7	31
	12:36:00	12:36:00		33.9	54.3	36	32.2	33.8	54.3	36	32.2
	12:37:00	12:37:00		36.6	57	38.8	34.7	36.6	57	38.8	34.7
	12:38:00	12:38:00		39.5	60.7	43.7	35.9	39.4	60.6	43.6	35.9
	12:39:00	12:39:00		38.7	60.6	40.9	35.6	38.7	60.4	40.8	35.6
	12:40:00	12:40:00		39.5	59.8	42.9	35.9	39.5	59.7	42.8	35.9
	12:41:00	12:41:00		36.5	63.8	41.8	33.3	36.5	63.8	41.8	33.3
	12:42:00	12:42:00		35.4	62.4	37.7	32.8	35.4	62.6	37.7	32.8
	12:43:00	12:43:00		34.7	55.6	37.3	31.5	34.7	55.7	37.3	31.5
	12:44:00	12:44:00		35.4	57.3	38	33.3	35.3	57	38	33.3
	12:45:00	12:45:00		34.9	57.3	36.9	33	34.9	57.1	36.8	32.9
	12:46:00	12:46:00		33.3	57.9	34.3	32.5	33.3	57.6	34.3	32.5
	12:47:00	12:47:00		32.8	50.6	33.9	32.1	32.8	50.4	33.8	32.1
	12:48:00	12:48:00		33.4	52	35.4	31.6	33.4	51.9	35.4	31.6
	12:49:00	12:49:00		36.8	55.6	39	33.5	36.8	55.6	39	33.5
	12:50:00	12:50:00		34.9	54.4	36.7	33.3	34.8	54.5	36.6	33.3
	12:51:00	12:51:00		37.3	58.5	40	33.7	37.3	58.3	39.9	33.7
	12:52:00	12:52:00		36.5	55.1	38.4	35.3	36.5	55.1	38.4	35.3
	12:53:00	12:53:00		35.7	64.4	37.8	34	35.7	64.4	37.8	34
	12:54:00	12:54:00		38.8	58.1	42.8	35.2	38.8	58.2	42.8	35.2
	12:55:00	12:55:00		39.5	60.8	43.1	36.2	39.5	60.6	43	36.2
	12:56:00	12:56:00		40.5	64.3	42.6	38.7	40.5	64.3	42.6	38.7
	12:57:00	12:57:00		38.8	57.7	40.6	36.7	38.7	57.5	40.6	36.7
	12:58:00	12:58:00		42	65.5	47.3	38.3	41.9	65.5	47.3	38.3
	12:59:00	12:59:00		41.8	61.1	45.6	38.1	41.8	60.7	45.6	38
	13:00:00	13:00:00		41.3	65.4	45.4	36.4	41.3	65.4	45.4	36.4
	13:01:00	13:01:00		37.4	56.8	39.8	35.3	37.4	56.8	39.8	35.3
	13:02:00	13:02:00		38.2	57.4	41	35.5	38.2	57.8	40.9	35.5
	13:03:00	13:03:00		39.5	60.4	42.2	36.4	39.5	60	42.2	36.4
	13:04:00	13:04:00		37.5	64.3	39.2	35.9	37.5	64.2	39.2	35.9
	13:05:00	13:05:00		36.4	57.9	38.5	34.5	36.4	57.8	38.5	34.4
	13:06:00	13:06:00		34.1	51.4	36.4	32.6	34	51.8	36.4	32.5
	13:07:00	13:07:00		34.6	57.1	37	33.1	34.6	57.1	37	33.1
	13:08:00	13:08:00		34	53.5	36.3	32.6	34	53.5	36.3	32.5
	13:09:00	13:09:00		33.6	55.5	36.6	31.6	33.6	55.8	36.6	31.6
	13:10:00	13:10:00		33.6	58.9	35.2	31.6	33.6	59	35.2	31.5
	13:11:00	13:11:00		34.5	55.4	37.3	31.9	34.4	55.3	37.2	31.9
	13:12:00	13:12:00		35.1	60.4	40.2	32.3	35.1	60.1	40.1	32.3
	13:13:00	13:13:00		36.8	58.8	38.6	34.7	36.8	58.8	38.6	34.7
	13:14:00	13:14:00		35.9	55.1	37.7	34.6	35.9	55.3	37.7	34.5
	13:15:00	13:15:00		34.3	57	35.5	33.3	34.3	56.8	35.5	33.3
	13:16:00	13:16:00		34	51.4	35.7	32.8	33.9	51.4	35.7	32.8
	13:17:00	13:17:00		34.1	57.6	35.9	32.8	34.1	57.6	35.9	32.8
	13:18:00	13:18:00		34	55.9	35.6	32.1	34	55.6	35.6	32.1
	13:19:00	13:19:00		36.1	56.4	37.2	33.7	36	55.8	37.2	33.7
	13:20:00	13:20:00		35.9	55.8	38.1	33.5	35.8	56.1	38.1	33.5
	13:21:00	13:21:00		34.6	51.1	36.9	32.1	34.6	50.9	36.9	32
	13:22:00	13:22:00		33.4	54	34.8	32.1	33.4	54.1	34.8	32.1
	13:23:00	13:23:00		33.4	52.2	35.4	31.9	33.4	52.7	35.4	31.9
	13:24:00	13:24:00		34.8	55.8	38.4	32.1	34.7	56	38.4	32.1
	13:25:00	13:25:00		34.3	54.8	35.8	32.1	34.3	54.7	35.8	32
	13:26:00	13:26:00		34.5	57.2	36.7	32.6	34.5	57.2	36.7	32.6
	13:27:00	13:27:00		34.2	52.8	35.8	32.8	34.2	52.6	35.7	32.8
	13:28:00	13:28:00		35.6	54.3	37.4	33.7	35.6	54.4	37.4	33.7
	13:29:00	13:29:00		36.2	61.3	37.9	34.1	36.2	61.4	37.9	34.1
	13:30:00	13:30:00		34.2	52.7	36.1	32.1	34.2	52.9	36	32.1
	13:31:00	13:31:00		35.6	57.1	37.8	33.7	35.6	57.3	37.8	33.7
	13:32:00	13:32:00		36.1	54.5	38.5	34.3	36.1	54.4	38.5	34.3
	13:33:00	13:33:00		34.5	53.5	36.2	33.1	34.5	53.5	36.2	33.1
	13:34:00	13:34:00		35.7	60.9	36.6	33.6	35.7	61	36.6	33.6
	13:35:00	13:35:00		33.7	55.7	34.9	32.3	33.7	55.5	34.9	32.3
	13:36:00	13:36:00		36.8	57.5	39.2	34.7	36.8	57.1	39.2	34.7
	13:37:00	13:37:00		37	64.3	41.9	34.1	37	64.2	41.9	34.1
	13:38:00	13:38:00		38.7	56.5	40.7	37.1	38.7	56.5	40.7	37.1
	13:39:00	13:39:00		36.9	55.4	38.6	35.7	36.9	55.6	38.6	35.7
	13:40:00	13:40:00		36.9	58.7	40	34.2	36.9	58.7	40	34.2
	13:41:00	13:41:00		38.8	56.7	42.3	35.1	38.8	56.6	42.3	35.1
	13:42:00	13:42:00		38.8	59.3	42.6	35.3	38.8	59.1	42.6	35.3
	13:43:00	13:43:00		36.6	57.7	38.8	34.2	36.6	57.9	38.7	34.2
	13:44:00	13:44:00		37.7	57.8	41.7	34.7	37.7	57.8	41.7	34.6
	13:45:00	13:45:00		39.1	59.4	41.2	36.7	39.1	59.3	41.2	36.7
	13:46:00	13:46:00		42	61.4	44.5	39.9	42	61.2	44.5	39.9
	13:47:00	13:47:00		40.8	59.8	42.8	38	40.8	59.8	42.8	38
	13:48:00	13:48:00		41.5	62.3	44.1	37.4	41.5	62.5	44.1	37.4
	13:49:00	13:49:00		43	60.1	45.9	39.2	43	60.2	45.9	39.2
	13:50:00	13:50:00		42.5	64.6	44.5	39.8	42.4	64.4	44.5	39.7
	13:51:00	13:51:00		41.4	59.5	44.1	39.1	41.4	59.5	44	39.1
	13:52:00	13:52:00		43	63	47.2	39.1	43	62.9	47.2	39.1
	13:53:00	13:53:00		39.9	61.2	41.8	36	39.9	60.9	41.8	36
	13:54:00	13:54:00		39.1	61.9	41.2	36.9	39.1	61.6	41.2	36.9
	13:55:00	13:55:00		40.7	60.8	42.8	38.1	40.7	60.7	42.8	38.1
	13:56:00	13:56:00		40	62.5	41.7	37.3	40	62.3	41.7	37.3
	13:57:00	13:57:00		38.8	56.1	40.6	36.6	38.8	56.2	40.6	36.6
	13:58:00	13:58:00		37.9	60.7	41.9	35.3	37.9	60.5	41.8	35.3

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
2:04 AM	10/22/2020	1778.3	42.5	17782.8	42.5	17782.8				
2:05 AM	10/22/2020	2454.7	43.9	24547.1	43.9	24547.1				
2:06 AM	10/22/2020	4570.9	46.6	45708.8	46.6	45708.8				
2:07 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
2:08 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
2:09 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
2:10 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
2:11 AM	10/22/2020	3467.4	45.4	34673.7	45.4	34673.7				
2:12 AM	10/22/2020	2951.2	44.7	29512.1	44.7	29512.1				
2:13 AM	10/22/2020	3467.4	45.4	34673.7	45.4	34673.7				
2:14 AM	10/22/2020	3090.3	44.9	30903.0	44.9	30903.0				
2:15 AM	10/22/2020	2138.0	43.3	21379.6	43.3	21379.6				
2:16 AM	10/22/2020	1905.5	42.8	19054.6	42.8	19054.6				
2:17 AM	10/22/2020	2187.8	43.4	21877.6	43.4	21877.6				
2:18 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
2:19 AM	10/22/2020	3090.3	44.9	30903.0	44.9	30903.0				
2:20 AM	10/22/2020	5370.3	47.3	53703.2	47.3	53703.2				
2:21 AM	10/22/2020	4466.8	46.5	44668.4	46.5	44668.4				
2:22 AM	10/22/2020	3715.4	45.7	37153.5	45.7	37153.5				
2:23 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
2:24 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
2:25 AM	10/22/2020	11220.2	50.5	112201.8	50.5	112201.8				
2:26 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
2:27 AM	10/22/2020	15848.9	52.0	158489.3	52.0	158489.3				
2:28 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
2:29 AM	10/22/2020	13489.6	51.3	134896.3	51.3	134896.3				
2:30 AM	10/22/2020	5495.4	47.4	54954.1	47.4	54954.1				
2:31 AM	10/22/2020	6606.9	48.2	66069.3	48.2	66069.3				
2:32 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
2:33 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
2:34 AM	10/22/2020	4365.2	46.4	43651.6	46.4	43651.6				
2:35 AM	10/22/2020	2570.4	44.1	25704.0	44.1	25704.0				
2:36 AM	10/22/2020	2884.0	44.6	28840.3	44.6	28840.3				
2:37 AM	10/22/2020	2511.9	44.0	25118.9	44.0	25118.9				
2:38 AM	10/22/2020	2290.9	43.6	22908.7	43.6	22908.7				
2:39 AM	10/22/2020	2290.9	43.6	22908.7	43.6	22908.7				
2:40 AM	10/22/2020	2818.4	44.5	28183.8	44.5	28183.8				
2:41 AM	10/22/2020	3235.9	45.1	32359.4	45.1	32359.4				
2:42 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
2:43 AM	10/22/2020	3890.5	45.9	38904.5	45.9	38904.5				
2:44 AM	10/22/2020	2691.5	44.3	26915.3	44.3	26915.3				
2:45 AM	10/22/2020	2511.9	44.0	25118.9	44.0	25118.9				
2:46 AM	10/22/2020	2570.4	44.1	25704.0	44.1	25704.0				
2:47 AM	10/22/2020	2511.9	44.0	25118.9	44.0	25118.9				
2:48 AM	10/22/2020	4073.8	46.1	40738.0	46.1	40738.0				
2:49 AM	10/22/2020	3890.5	45.9	38904.5	45.9	38904.5				
2:50 AM	10/22/2020	2884.0	44.6	28840.3	44.6	28840.3				
2:51 AM	10/22/2020	2187.8	43.4	21877.6	43.4	21877.6				
2:52 AM	10/22/2020	2187.8	43.4	21877.6	43.4	21877.6				
2:53 AM	10/22/2020	3020.0	44.8	30199.5	44.8	30199.5				
2:54 AM	10/22/2020	2691.5	44.3	26915.3	44.3	26915.3				
2:55 AM	10/22/2020	2818.4	44.5	28183.8	44.5	28183.8				
2:56 AM	10/22/2020	2630.3	44.2	26302.7	44.2	26302.7				
2:57 AM	10/22/2020	3630.8	45.6	36307.8	45.6	36307.8				
2:58 AM	10/22/2020	4168.7	46.2	41686.9	46.2	41686.9				
2:59 AM	10/22/2020	2630.3	44.2	26302.7	44.2	26302.7				
3:00 AM	10/22/2020	3630.8	45.6	36307.8	45.6	36307.8				
3:01 AM	10/22/2020	4073.8	46.1	40738.0	46.1	40738.0				
3:02 AM	10/22/2020	2818.4	44.5	28183.8	44.5	28183.8				
3:03 AM	10/22/2020	3715.4	45.7	37153.5	45.7	37153.5				
3:04 AM	10/22/2020	2344.2	43.7	23442.3	43.7	23442.3				
3:05 AM	10/22/2020	4786.3	46.8	47863.0	46.8	47863.0				
3:06 AM	10/22/2020	5011.9	47.0	50118.7	47.0	50118.7				
3:07 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
3:08 AM	10/22/2020	4897.8	46.9	48977.9	46.9	48977.9				
3:09 AM	10/22/2020	4897.8	46.9	48977.9	46.9	48977.9				
3:10 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
3:11 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
3:12 AM	10/22/2020	4570.9	46.6	45708.8	46.6	45708.8				
3:13 AM	10/22/2020	5888.4	47.7	58884.4	47.7	58884.4				
3:14 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
3:15 AM	10/22/2020	15848.9	52.0	158489.3	52.0	158489.3				
3:16 AM	10/22/2020	12022.6	50.8	120226.4	50.8	120226.4				
3:17 AM	10/22/2020	14125.4	51.5	141253.8	51.5	141253.8				
3:18 AM	10/22/2020	19952.6	53.0	199526.2	53.0	199526.2				
3:19 AM	10/22/2020	17782.8	52.5	177827.9	52.5	177827.9				
3:20 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
3:21 AM	10/22/2020	19952.6	53.0	199526.2	53.0	199526.2				
3:22 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
3:23 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
3:24 AM	10/22/2020	11749.0	50.7	117489.8	50.7	117489.8				
3:25 AM	10/22/2020	10000.0	50.0	100000.0	50.0	100000.0				
3:26 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
3:27 AM	10/22/2020	6166.0	47.9	61659.5	47.9	61659.5				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	13:59:00	13:59:00		40.1	61.8	44.2	37.7	40	61.7	44.2	37.6
	14:00:00	14:00:00		38.2	56.5	41.9	35.1	38.2	56.5	41.9	35.1
	14:01:00	14:01:00		38.1	58.9	40.5	35.5	38.1	58.6	40.5	35.5
	14:02:00	14:02:00		38.3	58.3	41.6	35.3	38.3	58.1	41.6	35.2
	14:03:00	14:03:00		39.1	62.6	41.9	35.8	39.1	62.6	41.9	35.8
	14:04:00	14:04:00		38.1	54.3	39.8	37.1	38.1	54.3	39.7	37
	14:05:00	14:05:00		39.1	59.5	41.2	36.9	39	59.6	41.2	36.9
	14:06:00	14:06:00		39.5	62.2	41.7	37.1	39.4	62	41.7	37
	14:07:00	14:07:00		38.4	56.4	40.5	36.6	38.4	56.7	40.5	36.6
	14:08:00	14:08:00		37.2	54.4	38.4	35	37.2	54.2	38.4	35
	14:09:00	14:09:00		39.3	61.6	42.1	35.3	39.3	61.4	42.1	35.3
	14:10:00	14:10:00		39.2	61.2	42.6	36.5	39.1	61.2	42.6	36.5
	14:11:00	14:11:00		37.4	56.5	39.8	34.8	37.4	56.5	39.8	34.8
	14:12:00	14:12:00		37.9	60.3	40.9	34.8	37.9	60.3	40.9	34.8
	14:13:00	14:13:00		38.7	60.2	40.1	36.1	38.7	60.3	40.1	36.1
	14:14:00	14:14:00		37.9	61.7	39.4	35.7	37.8	61.6	39.4	35.7
	14:15:00	14:15:00		37.4	56.1	40.8	34.3	37.4	56.3	40.7	34.3
	14:16:00	14:16:00		37.8	57	39.7	36.1	37.8	57.1	39.7	36
	14:17:00	14:17:00		35.8	63.4	37.8	34.4	35.8	63.4	37.8	34.4
	14:18:00	14:18:00		38.2	61.1	40.9	35.3	38.2	61.1	40.9	35.3
	14:19:00	14:19:00		38.9	60.8	43.5	36.1	38.8	60.6	43.5	36
	14:20:00	14:20:00		41.4	62.8	44.5	39	41.3	62.6	44.4	39
	14:21:00	14:21:00		40.9	62.4	43.7	38.4	40.9	62.2	43.6	38.4
	14:22:00	14:22:00		38.5	62.5	40.2	36	38.5	62.5	40.1	36.1
	14:23:00	14:23:00		36.9	59.5	38.7	34.5	36.9	59.7	38.7	34.5
	14:24:00	14:24:00		36.1	54.6	39.5	34.5	36.1	54.8	39.5	34.5
	14:25:00	14:25:00		38.8	59.2	40.5	36.9	38.8	59.1	40.5	36.9
	14:26:00	14:26:00		39.8	58.9	42.4	37.9	39.8	58.6	42.3	37.8
	14:27:00	14:27:00		40.3	59.3	43.6	37.1	40.3	59.5	43.6	37.1
	14:28:00	14:28:00		40.7	57.7	42.6	37.7	40.7	57.7	42.6	37.7
	14:29:00	14:29:00		38.4	61.1	40.5	36.2	38.4	61.1	40.5	36.2
	14:30:00	14:30:00		39	59	41.2	36.5	39	59.2	41.2	36.5
	14:31:00	14:31:00		37.8	57.5	39.8	36.7	37.8	57.5	39.8	36.7
	14:32:00	14:32:00		39.6	61.8	44.1	36.6	39.6	61.7	44.1	36.5
	14:33:00	14:33:00		38.9	62.6	42	36.5	38.8	62.4	42	36.5
	14:34:00	14:34:00		39.3	61.6	40.4	38.1	39.3	61.8	40.4	38.1
	14:35:00	14:35:00		40.4	58	44.1	36.5	40.3	58.1	44.1	36.5
	14:36:00	14:36:00		39.5	62.4	42	37.5	39.5	62.6	42	37.5
	14:37:00	14:37:00		39.4	60.1	43.1	35.7	39.3	60	43	35.6
	14:38:00	14:38:00		37.5	58.1	38.7	36.4	37.5	58.1	38.7	36.4
	14:39:00	14:39:00		38.4	63.5	41.3	36.3	38.4	63.3	41.2	36.3
	14:40:00	14:40:00		40.1	59.5	44.6	37.4	40.1	59.8	44.5	37.4
	14:41:00	14:41:00		38.4	59.8	42.1	35.4	38.4	59.9	42	35.4
	14:42:00	14:42:00		40	58.7	42.8	37.3	40	58.6	42.8	37.3
	14:43:00	14:43:00		38.7	56.5	42	36.9	38.7	56	42	36.9
	14:44:00	14:44:00		39.3	62.6	42.4	35.7	39.2	62.5	42.4	35.7
	14:45:00	14:45:00		38.4	61.7	40.6	36.5	38.4	61.6	40.5	36.5
	14:46:00	14:46:00		44.3	65.8	48.7	39.2	44.3	65.9	48.6	39.2
	14:47:00	14:47:00		44.4	64.6	48.1	40.2	44.4	64.6	48.1	40.1
	14:48:00	14:48:00		45.3	63.9	48.4	41.8	45.3	63.9	48.4	41.8
	14:49:00	14:49:00		45.2	67.6	49.8	41.8	45.2	67.6	49.7	41.8
	14:50:00	14:50:00		42.4	65.4	45.3	40.3	42.4	65.2	45.3	40.3
	14:51:00	14:51:00		42.7	62.6	44.9	40.2	42.7	62.3	44.9	40.1
	14:52:00	14:52:00		43.4	70.2	49.3	41	43.4	70.1	49.2	41
	14:53:00	14:53:00		45.6	70.5	49.6	42.2	45.6	70.3	49.6	42.2
	14:54:00	14:54:00		44.7	63.8	47.3	41.3	44.7	63.9	47.3	41.3
	14:55:00	14:55:00		44.7	65.9	47.6	41.8	44.7	65.9	47.6	41.8
	14:56:00	14:56:00		43.2	62.7	45.7	40.1	43.2	62.8	45.7	40.1
	14:57:00	14:57:00		43.6	62.6	47.1	40.6	43.6	62.8	47	40.6
	14:58:00	14:58:00		43.1	65.8	46.2	39.4	43.1	65.9	46.2	39.4
	14:59:00	14:59:00		41.1	63.1	43.9	38.3	41.1	63.1	43.9	38.3
	15:00:00	15:00:00		39.4	58.4	42.7	36.1	39.4	58.2	42.7	36.1
	15:01:00	15:01:00		39.2	57.1	41.6	37	39.2	57.2	41.6	37
	15:02:00	15:02:00		41.8	68.5	45.5	38.1	41.8	68.4	45.5	38.1
	15:03:00	15:03:00		40.4	60.6	44.1	37.6	40.4	60.6	44.1	37.6
	15:04:00	15:04:00		41.4	62.8	45	38	41.4	62.9	45	38
	15:05:00	15:05:00		43.8	63.5	46.3	40.1	43.7	63.6	46.3	40
	15:06:00	15:06:00		43.3	64.2	46.3	40	43.2	64.2	46.3	40
	15:07:00	15:07:00		41.9	60.7	44.4	38.3	41.9	60.7	44.4	38.3
	15:08:00	15:08:00		43.4	60.9	45.8	40.4	43.3	61.1	45.7	40.4
	15:09:00	15:09:00		41.5	60.9	44.8	38.1	41.4	61	44.8	38.1
	15:10:00	15:10:00		39.3	59.4	42.3	36.5	39.3	59.8	42.3	36.4
	15:11:00	15:11:00		39.4	59	42.3	37.3	39.3	58.6	42.3	37.3
	15:12:00	15:12:00		38.9	57.8	41.7	36.9	38.9	58.1	41.7	36.9
	15:13:00	15:13:00		42.4	60.8	45.2	39.2	42.4	60.7	45.2	39.2
	15:14:00	15:14:00		40.1	62	44.5	37.5	40.1	62	44.5	37.5
	15:15:00	15:15:00		41.2	61.8	43.6	39.4	41.2	61.8	43.6	39.4
	15:16:00	15:16:00		41.1	64.9	45.9	38.6	41	64.9	45.9	38.6
	15:17:00	15:17:00		41.8	63.5	43.9	39.5	41.8	63.4	43.9	39.5
	15:18:00	15:18:00		42.3	62.2	44.1	39.5	42.3	62	44.1	39.5
	15:19:00	15:19:00		43.7	62.6	45.6	40.2	43.7	62.4	45.6	40.2
	15:20:00	15:20:00		41.8	62.3	46.2	38.4	41.8	62.3	46.2	38.4
	15:21:00	15:21:00		41.7	65.9	44.5	39.3	41.7	66	44.5	39.3
	15:22:00	15:22:00		40.5	63.2	43.1	38.4	40.4	63.1	43.1	38.4

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
3:28 AM	10/22/2020	10232.9	50.1	102329.3	50.1	102329.3				
3:29 AM	10/22/2020	6606.9	48.2	66069.3	48.2	66069.3				
3:30 AM	10/22/2020	6456.5	48.1	64565.4	48.1	64565.4				
3:31 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
3:32 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
3:33 AM	10/22/2020	6456.5	48.1	64565.4	48.1	64565.4				
3:34 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
3:35 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
3:36 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
3:37 AM	10/22/2020	5248.1	47.2	52480.7	47.2	52480.7				
3:38 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
3:39 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
3:40 AM	10/22/2020	5495.4	47.4	54954.1	47.4	54954.1				
3:41 AM	10/22/2020	6166.0	47.9	61659.5	47.9	61659.5				
3:42 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
3:43 AM	10/22/2020	6166.0	47.9	61659.5	47.9	61659.5				
3:44 AM	10/22/2020	5495.4	47.4	54954.1	47.4	54954.1				
3:45 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
3:46 AM	10/22/2020	3801.9	45.8	38018.9	45.8	38018.9				
3:47 AM	10/22/2020	6606.9	48.2	66069.3	48.2	66069.3				
3:48 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
3:49 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
3:50 AM	10/22/2020	12302.7	50.9	123026.9	50.9	123026.9				
3:51 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
3:52 AM	10/22/2020	4897.8	46.9	48977.9	46.9	48977.9				
3:53 AM	10/22/2020	4073.8	46.1	40738.0	46.1	40738.0				
3:54 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
3:55 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
3:56 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
3:57 AM	10/22/2020	11749.0	50.7	117489.8	50.7	117489.8				
3:58 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
3:59 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
4:00 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
4:01 AM	10/22/2020	9120.1	49.6	91201.1	49.6	91201.1				
4:02 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
4:03 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
4:04 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
4:05 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
4:06 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
4:07 AM	10/22/2020	5623.4	47.5	56234.1	47.5	56234.1				
4:08 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
4:09 AM	10/22/2020	10232.9	50.1	102329.3	50.1	102329.3				
4:10 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
4:11 AM	10/22/2020	10000.0	50.0	100000.0	50.0	100000.0				
4:12 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
4:13 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
4:14 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
4:15 AM	10/22/2020	26915.3	54.3	269153.5	54.3	269153.5				
4:16 AM	10/22/2020	27542.3	54.4	275422.9	54.4	275422.9				
4:17 AM	10/22/2020	33884.4	55.3	338844.2	55.3	338844.2				
4:18 AM	10/22/2020	33113.1	55.2	331131.1	55.2	331131.1				
4:19 AM	10/22/2020	17378.0	52.4	173780.1	52.4	173780.1				
4:20 AM	10/22/2020	18620.9	52.7	186208.7	52.7	186208.7				
4:21 AM	10/22/2020	21877.6	53.4	218776.2	53.4	218776.2				
4:22 AM	10/22/2020	36307.8	55.6	363078.1	55.6	363078.1				
4:23 AM	10/22/2020	29512.1	54.7	295120.9	54.7	295120.9				
4:24 AM	10/22/2020	29512.1	54.7	295120.9	54.7	295120.9				
4:25 AM	10/22/2020	20893.0	53.2	208929.6	53.2	208929.6				
4:26 AM	10/22/2020	22908.7	53.6	229086.8	53.6	229086.8				
4:27 AM	10/22/2020	20417.4	53.1	204173.8	53.1	204173.8				
4:28 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
4:29 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
4:30 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
4:31 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
4:32 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
4:33 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
4:34 AM	10/22/2020	23988.3	53.8	239883.3	53.8	239883.3				
4:35 AM	10/22/2020	21379.6	53.3	213796.2	53.3	213796.2				
4:36 AM	10/22/2020	15488.2	51.9	154881.7	51.9	154881.7				
4:37 AM	10/22/2020	21877.6	53.4	218776.2	53.4	218776.2				
4:38 AM	10/22/2020	14125.4	51.5	141253.8	51.5	141253.8				
4:39 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
4:40 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
4:41 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
4:42 AM	10/22/2020	17378.0	52.4	173780.1	52.4	173780.1				
4:43 AM	10/22/2020	10232.9	50.1	102329.3	50.1	102329.3				
4:44 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
4:45 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
4:46 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
4:47 AM	10/22/2020	16982.4	52.3	169824.4	52.3	169824.4				
4:48 AM	10/22/2020	23442.3	53.7	234422.9	53.7	234422.9				
4:49 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
4:50 AM	10/22/2020	14791.1	51.7	147910.8	51.7	147910.8				
4:51 AM	10/22/2020	11220.2	50.5	112201.8	50.5	112201.8				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	15:23:00	15:23:00		40	57.4	41.6	38.2	40	57.6	41.6	38.2
	15:24:00	15:24:00		38.3	57.4	41.7	35.4	38.3	57.3	41.7	35.4
	15:25:00	15:25:00		38.8	58.3	40.1	37.4	38.8	58.5	40	37.4
	15:26:00	15:26:00		38.6	56.5	41.5	36.1	38.6	56.3	41.4	36.1
	15:27:00	15:27:00		38.6	60.6	41.3	36.8	38.6	60.6	41.2	36.8
	15:28:00	15:28:00		40.7	62.6	43.1	36.5	40.7	62.7	43.1	36.5
	15:29:00	15:29:00		40	61.3	42.9	37.8	40	61.4	42.9	37.8
	15:30:00	15:30:00		40.4	58.7	44.2	37.7	40.4	58.6	44.2	37.7
	15:31:00	15:31:00		42.7	69.1	44.9	40	42.7	69.1	44.9	40
	15:32:00	15:32:00		39.2	60	41.8	37.8	39.2	60.1	41.8	37.8
	15:33:00	15:33:00		40.4	61.1	43.2	37.9	40.3	61.1	43.2	37.9
	15:34:00	15:34:00		40.4	58.9	43	38.3	40.4	58.8	42.9	38.3
	15:35:00	15:35:00		41.2	65.3	43.2	38.5	41.1	65.1	43.2	38.5
	15:36:00	15:36:00		40.9	61.5	43.3	38.6	40.8	61.5	43.3	38.6
	15:37:00	15:37:00		40.8	67.6	43.5	37.6	40.8	67.7	43.5	37.5
	15:38:00	15:38:00		41.5	66.4	44.6	38.4	41.4	66.3	44.6	38.4
	15:39:00	15:39:00		39.7	64	42.3	37.8	39.6	63.9	42.2	37.7
	15:40:00	15:40:00		41.6	62.9	43.7	38.1	41.6	62.9	43.7	38.1
	15:41:00	15:41:00		41.9	59.7	43.8	39.7	41.9	59.8	43.8	39.7
	15:42:00	15:42:00		40.1	57.8	41.9	38.1	40.1	57.8	41.8	38.1
	15:43:00	15:43:00		39.8	56.7	43.2	37.8	39.7	56.8	43.2	37.7
	15:44:00	15:44:00		40.3	63.8	42	38.8	40.3	63.8	41.9	38.8
	15:45:00	15:45:00		42.5	64.2	45.6	39.4	42.4	64.2	45.6	39.4
	15:46:00	15:46:00		43.6	64.3	47.3	40.9	43.6	64.3	47.3	40.8
	15:47:00	15:47:00		41.9	59.6	44.4	38.6	41.8	59.6	44.3	38.6
	15:48:00	15:48:00		42.3	65.4	45.5	39	42.3	65.3	45.5	39
	15:49:00	15:49:00		44.3	66.9	49.5	40.4	44.3	66.9	49.5	40.3
	15:50:00	15:50:00		40.2	58.7	41.5	38.1	40.2	58.5	41.5	38.1
	15:51:00	15:51:00		40.8	65	44.4	37.9	40.8	65	44.4	37.9
	15:52:00	15:52:00		41.5	63.8	43	39.4	41.4	63.7	43	39.4
	15:53:00	15:53:00		43.1	74.2	46.2	39.8	43.1	74.2	46.1	39.8
	15:54:00	15:54:00		41.8	60.9	44.8	38.5	41.7	60.8	44.8	38.5
	15:55:00	15:55:00		42	63.2	46.4	40	42	63	46.4	40
	15:56:00	15:56:00		43.3	62.7	46.9	40.4	43.2	62.3	46.9	40.4
	15:57:00	15:57:00		41.7	61.9	43.3	39.5	41.6	62	43.3	39.5
	15:58:00	15:58:00		42.9	67.3	45.8	40.4	42.9	67.2	45.7	40.3
	15:59:00	15:59:00		41	66.9	45	39.3	41	66.9	45	39.3
	16:00:00	16:00:00		40.9	64.5	44.3	38.6	40.9	64.4	44.2	38.6
	16:01:00	16:01:00		43	62.7	46.1	40.4	42.9	62.9	46.1	40.4
	16:02:00	16:02:00		40.9	62.9	43.6	38.4	40.9	62.9	43.6	38.4
	16:03:00	16:03:00		40.6	59.1	43.9	38.5	40.6	59.1	43.8	38.5
	16:04:00	16:04:00		39.9	64	42.5	38.2	39.9	63.8	42.5	38.2
	16:05:00	16:05:00		40.6	58.1	43.8	37.8	40.6	58.2	43.8	37.8
	16:06:00	16:06:00		41	62.1	44.5	37.7	41	61.9	44.5	37.6
	16:07:00	16:07:00		39.7	61.7	43.2	37.6	39.7	61.7	43.2	37.5
	16:08:00	16:08:00		39.3	57.1	42.1	37.7	39.3	57.1	42.1	37.6
	16:09:00	16:09:00		42	68.2	45.9	38.1	42	68.1	45.9	38.1
	16:10:00	16:10:00		39.8	60.4	41.8	37.9	39.8	60.7	41.8	37.9
	16:11:00	16:11:00		43.3	65.1	46.9	38.3	43.3	65.1	46.9	38.3
	16:12:00	16:12:00		41.2	63.6	44.5	38.2	41.2	63.6	44.5	38.2
	16:13:00	16:13:00		39.2	60	41.6	37.6	39.1	59.9	41.6	37.5
	16:14:00	16:14:00		43.3	64.4	47.3	38.6	43.3	64.3	47.3	38.6
	16:15:00	16:15:00		46.5	71.5	50.1	42.4	46.5	71.5	50.1	42.3
	16:16:00	16:16:00		43.8	64.5	47.4	41.1	43.8	64.5	47.4	41
	16:17:00	16:17:00		42.9	62.1	45.2	40	42.9	62.2	45.2	40
	16:18:00	16:18:00		44	68.2	46.3	40.5	44	68.1	46.2	40.4
	16:19:00	16:19:00		42.7	65	46.1	38.8	42.7	64.9	46.1	38.8
	16:20:00	16:20:00		46.9	66	48.9	43.7	46.9	65.9	48.9	43.7
	16:21:00	16:21:00		42.5	70.2	46.4	40.4	42.4	70.1	46.4	40.4
	16:22:00	16:22:00		42.4	67.5	44.7	40.5	42.4	67.5	44.7	40.5
	16:23:00	16:23:00		40.4	63.1	43.3	38.8	40.4	63.1	43.3	38.7
	16:24:00	16:24:00		39	60.8	40.7	38	38.9	60.8	40.7	38
	16:25:00	16:25:00		38.8	55.7	40.2	37.6	38.7	55.2	40.2	37.5
	16:26:00	16:26:00		39.5	57.5	41.1	38	39.4	57.2	41.1	37.9
	16:27:00	16:27:00		39	58.2	40.8	38	39	58	40.7	37.9
	16:28:00	16:28:00		39.7	60.5	43.7	37.6	39.7	60.6	43.7	37.6
	16:29:00	16:29:00		37.8	55.8	41.6	36	37.8	55.9	41.6	36
	16:30:00	16:30:00		37.1	60	39.1	35.5	37.1	59.9	39	35.4
	16:31:00	16:31:00		38	53.8	39.3	36.1	38	54.2	39.2	36.1
	16:32:00	16:32:00		39	68.8	42	37.6	39	68.8	41.9	37.6
	16:33:00	16:33:00		38.7	59.8	41.1	36.8	38.7	59.8	41.1	36.7
	16:34:00	16:34:00		39.6	60.6	41.4	37.7	39.6	60.5	41.4	37.7
	16:35:00	16:35:00		39.3	55.9	40.5	38.1	39.3	55.9	40.5	38
	16:36:00	16:36:00		38.7	54.9	40.2	37.5	38.7	55.2	40.2	37.5
	16:37:00	16:37:00		40.2	58	43.3	38.5	40.2	58	43.3	38.5
	16:38:00	16:38:00		41	66.6	42.9	39.7	41	66.6	42.9	39.7
	16:39:00	16:39:00		40.7	58.2	42.2	39.6	40.7	58.4	42.2	39.6
	16:40:00	16:40:00		41.7	58.9	44	39.2	41.7	59	44	39.2
	16:41:00	16:41:00		41.1	59.2	44	38.9	41.1	59.3	44	38.8
	16:42:00	16:42:00		43.8	64.1	46.3	40	43.8	64	46.3	40
	16:43:00	16:43:00		42.8	62.2	45.4	40.3	42.8	62.1	45.4	40.3
	16:44:00	16:44:00		41.7	61.7	42.5	40.8	41.7	61.7	42.5	40.7
	16:45:00	16:45:00		43.6	70.2	45.5	41.7	43.5	70	45.4	41.7
	16:46:00	16:46:00		43.7	64.5	45	42.1	43.7	64.5	45	42.1

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
4:52 AM	10/22/2020	10000.0	50.0	100000.0	50.0	100000.0				
4:53 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
4:54 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
4:55 AM	10/22/2020	7244.4	48.6	72443.6	48.6	72443.6				
4:56 AM	10/22/2020	7244.4	48.6	72443.6	48.6	72443.6				
4:57 AM	10/22/2020	11749.0	50.7	117489.8	50.7	117489.8				
4:58 AM	10/22/2020	10000.0	50.0	100000.0	50.0	100000.0				
4:59 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
5:00 AM	10/22/2020	18620.9	52.7	186208.7	52.7	186208.7				
5:01 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
5:02 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
5:03 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
5:04 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
5:05 AM	10/22/2020	12302.7	50.9	123026.9	50.9	123026.9				
5:06 AM	10/22/2020	12022.6	50.8	120226.4	50.8	120226.4				
5:07 AM	10/22/2020	14125.4	51.5	141253.8	51.5	141253.8				
5:08 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
5:09 AM	10/22/2020	14454.4	51.6	144544.0	51.6	144544.0				
5:10 AM	10/22/2020	15488.2	51.9	154881.7	51.9	154881.7				
5:11 AM	10/22/2020	10232.9	50.1	102329.3	50.1	102329.3				
5:12 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
5:13 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
5:14 AM	10/22/2020	17782.8	52.5	177827.9	52.5	177827.9				
5:15 AM	10/22/2020	22908.7	53.6	229086.8	53.6	229086.8				
5:16 AM	10/22/2020	15488.2	51.9	154881.7	51.9	154881.7				
5:17 AM	10/22/2020	16982.4	52.3	169824.4	52.3	169824.4				
5:18 AM	10/22/2020	26915.3	54.3	269153.5	54.3	269153.5				
5:19 AM	10/22/2020	10471.3	50.2	104712.9	50.2	104712.9				
5:20 AM	10/22/2020	12022.6	50.8	120226.4	50.8	120226.4				
5:21 AM	10/22/2020	14125.4	51.5	141253.8	51.5	141253.8				
5:22 AM	10/22/2020	20417.4	53.1	204173.8	53.1	204173.8				
5:23 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
5:24 AM	10/22/2020	15848.9	52.0	158489.3	52.0	158489.3				
5:25 AM	10/22/2020	21379.6	53.3	213796.2	53.3	213796.2				
5:26 AM	10/22/2020	14791.1	51.7	147910.8	51.7	147910.8				
5:27 AM	10/22/2020	19498.4	52.9	194984.5	52.9	194984.5				
5:28 AM	10/22/2020	12589.3	51.0	125892.5	51.0	125892.5				
5:29 AM	10/22/2020	12302.7	50.9	123026.9	50.9	123026.9				
5:30 AM	10/22/2020	19952.6	53.0	199526.2	53.0	199526.2				
5:31 AM	10/22/2020	12302.7	50.9	123026.9	50.9	123026.9				
5:32 AM	10/22/2020	11481.5	50.6	114815.4	50.6	114815.4				
5:33 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
5:34 AM	10/22/2020	11481.5	50.6	114815.4	50.6	114815.4				
5:35 AM	10/22/2020	12589.3	51.0	125892.5	51.0	125892.5				
5:36 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
5:37 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
5:38 AM	10/22/2020	15848.9	52.0	158489.3	52.0	158489.3				
5:39 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
5:40 AM	10/22/2020	21379.6	53.3	213796.2	53.3	213796.2				
5:41 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
5:42 AM	10/22/2020	8317.6	49.2	83176.4	49.2	83176.4				
5:43 AM	10/22/2020	21379.6	53.3	213796.2	53.3	213796.2				
5:44 AM	10/22/2020	44668.4	56.5	446683.6	56.5	446683.6				
5:45 AM	10/22/2020	23988.3	53.8	239883.3	53.8	239883.3				
5:46 AM	10/22/2020	19498.4	52.9	194984.5	52.9	194984.5				
5:47 AM	10/22/2020	25118.9	54.0	251188.6	54.0	251188.6				
5:48 AM	10/22/2020	18620.9	52.7	186208.7	52.7	186208.7				
5:49 AM	10/22/2020	48977.9	56.9	489778.8	56.9	489778.8				
5:50 AM	10/22/2020	17782.8	52.5	177827.9	52.5	177827.9				
5:51 AM	10/22/2020	17378.0	52.4	173780.1	52.4	173780.1				
5:52 AM	10/22/2020	10964.8	50.4	109647.8	50.4	109647.8				
5:53 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
5:54 AM	10/22/2020	7585.8	48.8	75857.8	48.8	75857.8				
5:55 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
5:56 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
5:57 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
5:58 AM	10/22/2020	6025.6	47.8	60256.0	47.8	60256.0				
5:59 AM	10/22/2020	5128.6	47.1	51286.1	47.1	51286.1				
6:00 AM	10/22/2020	6309.6	48.0	63095.7	48.0	63095.7				
6:01 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
6:02 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
6:03 AM	10/22/2020	9120.1	49.6	91201.1	49.6	91201.1				
6:04 AM	10/22/2020	8511.4	49.3	85113.8	49.3	85113.8				
6:05 AM	10/22/2020	7413.1	48.7	74131.0	48.7	74131.0				
6:06 AM	10/22/2020	10471.3	50.2	104712.9	50.2	104712.9				
6:07 AM	10/22/2020	12589.3	51.0	125892.5	51.0	125892.5				
6:08 AM	10/22/2020	11749.0	50.7	117489.8	50.7	117489.8				
6:09 AM	10/22/2020	14791.1	51.7	147910.8	51.7	147910.8				
6:10 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
6:11 AM	10/22/2020	23988.3	53.8	239883.3	53.8	239883.3				
6:12 AM	10/22/2020	19054.6	52.8	190546.1	52.8	190546.1				
6:13 AM	10/22/2020	14791.1	51.7	147910.8	51.7	147910.8				
6:14 AM	10/22/2020	22908.7	53.6	229086.8	53.6	229086.8				
6:15 AM	10/22/2020	23442.3	53.7	234422.9	53.7	234422.9				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	16:47:00	16:47:00		43.3	62.3	44.5	42.1	43.3	62.4	44.5	42.1
	16:48:00	16:48:00		42.3	66.1	44.3	40.5	42.3	65.8	44.3	40.5
	16:49:00	16:49:00		42.3	63.4	44.1	40.1	42.2	63.1	44.1	40.1
	16:50:00	16:50:00		41.9	61.9	46.5	38.7	41.9	62	46.4	38.6
	16:51:00	16:51:00		39.9	63.7	43.2	37.9	39.9	63.6	43.2	37.9
	16:52:00	16:52:00		40.3	57.9	41.6	38.3	40.3	57.9	41.6	38.3
	16:53:00	16:53:00		39.5	61.6	41.7	37.9	39.5	61.5	41.6	37.8
	16:54:00	16:54:00		38.5	59.6	39.9	36.7	38.5	59.5	39.9	36.6
	16:55:00	16:55:00		39.8	55.8	42.3	37.7	39.8	55.8	42.3	37.7
	16:56:00	16:56:00		39.8	66.7	42.4	37.4	39.8	66.8	42.3	37.4
	16:57:00	16:57:00		39.7	60.5	42.4	37.7	39.7	60.4	42.4	37.6
	16:58:00	16:58:00		39.1	56.9	41.1	37.3	39.1	57	41.1	37.2
	16:59:00	16:59:00		38.9	58.4	41.2	37.3	38.9	58.1	41.2	37.3
	17:00:00	17:00:00		39.4	60	42.7	37.2	39.3	59.9	42.7	37.2
	17:01:00	17:01:00		41.1	68	44.3	38.6	41.1	68.1	44.3	38.6
	17:02:00	17:02:00		39.4	58.8	42.3	36.9	39.4	58.7	42.3	36.9
	17:03:00	17:03:00		39.7	61.5	41.3	38.4	39.7	61.4	41.3	38.4
	17:04:00	17:04:00		41.4	62	46.3	38.9	41.4	62.1	46.2	38.9
	17:05:00	17:05:00		40.7	65.8	43.4	38.3	40.7	65.7	43.4	38.3
	17:06:00	17:06:00		39.9	67.6	43.3	37.1	39.9	67.6	43.3	37.1
	17:07:00	17:07:00		39.8	63.5	42.5	36.6	39.8	63.5	42.5	36.6
	17:08:00	17:08:00		38.6	61.4	42.6	36.4	38.6	61.6	42.6	36.4
	17:09:00	17:09:00		38.4	57.3	39.7	36.7	38.3	56.9	39.6	36.7
	17:10:00	17:10:00		37.2	54.8	38.2	36.3	37.2	55.2	38.2	36.3
	17:11:00	17:11:00		38.3	57	40	36.8	38.2	57	40	36.8
	17:12:00	17:12:00		39.6	71.8	42.3	38.2	39.6	71.7	42.3	38.2
	17:13:00	17:13:00		39.9	62.4	43.8	38	39.9	62.3	43.8	38
	17:14:00	17:14:00		38.5	56.3	40.6	36.5	38.4	56.4	40.6	36.5
	17:15:00	17:15:00		41.2	68.5	49.1	37.1	41.2	68.5	49.1	37.1
	17:16:00	17:16:00		38.4	54.5	40	36.8	38.4	54.7	40	36.8
	17:17:00	17:17:00		39.7	60.5	42.1	37.5	39.7	60.4	42.1	37.5
	17:18:00	17:18:00		40.3	63.5	45.1	37.8	40.3	63.3	45.1	37.7
	17:19:00	17:19:00		39.9	58.9	41.3	38	39.9	58.9	41.3	38
	17:20:00	17:20:00		41.1	62.5	44.6	37.9	41.1	62.4	44.6	37.8
	17:21:00	17:21:00		38.5	58.8	40.8	37.4	38.5	58.8	40.8	37.4
	17:22:00	17:22:00		38.5	58	41.9	36.7	38.5	58.3	41.9	36.7
	17:23:00	17:23:00		39.5	60.8	43.6	37.1	39.5	60.7	43.5	37.1
	17:24:00	17:24:00		39	58.5	42.1	37.7	39	58.6	42.1	37.7
	17:25:00	17:25:00		41.8	65	45	39	41.7	65.1	45	39
	17:26:00	17:26:00		41	64	44.9	35.5	41	63.9	44.9	35.5
	17:27:00	17:27:00		40.8	74.5	46.8	34.7	40.8	74.5	46.7	34.7
	17:28:00	17:28:00		40.6	64.4	45	37.2	40.5	64.4	45	37.2
	17:29:00	17:29:00		44.6	71	54.1	38.7	44.6	71	54.1	38.6
	17:30:00	17:30:00		40.5	62.4	44.9	35.7	40.5	62.5	44.8	35.6
	17:31:00	17:31:00		70.7	94.1	77.2	35.4	70.7	94.1	77.2	35.4
	17:32:00	17:32:00		45.2	82.1	60.6	36	45.2	82	60.5	35.9
	17:33:00	17:33:00		39.8	59.9	42.7	36.6	39.8	59.6	42.6	36.5
	17:34:00	17:34:00		40	59.6	42.7	37.6	39.9	59.5	42.7	37.5
	17:35:00	17:35:00		39.5	59.4	43.6	36.8	39.5	59.4	43.6	36.8
	17:36:00	17:36:00		39.2	60.5	41.2	37	39.1	60.7	41.2	36.9
	17:37:00	17:37:00		53.7	78.5	60.6	37.2	53.7	78.5	60.6	37.2
	17:38:00	17:38:00		54	78.7	60	37	54	78.6	60	37
	17:39:00	17:39:00		46	73.2	55.1	36.7	46	73.2	55.1	36.6
	17:40:00	17:40:00		56.4	78.4	61.4	42.8	56.4	78.3	61.4	42.8
	17:41:00	17:41:00		53.3	76.3	59.1	41.7	53.3	76.3	59.1	41.6
	17:42:00	17:42:00		59.7	79.9	63.7	40.4	59.7	79.9	63.7	40.4
	17:43:00	17:43:00		60.2	79.8	63.6	54.2	60.2	79.8	63.5	54.2
	17:44:00	17:44:00		59.8	80.3	62.6	51.6	59.8	80.3	62.6	51.6
	17:45:00	17:45:00		59	80.1	64.2	45.7	59	80	64.1	45.7
	17:46:00	17:46:00		43.5	71.2	56	37.7	43.4	71.2	56	37.7
	17:47:00	17:47:00		46.5	75	56.7	38.6	46.5	75	56.7	38.6
	17:48:00	17:48:00		48.7	72.5	54.2	42	48.7	72.4	54.2	42
	17:49:00	17:49:00		49.7	71.6	53.1	43.7	49.7	71.6	53.1	43.7
	17:50:00	17:50:00		49.2	71.9	53.6	41	49.2	71.8	53.6	41
	17:51:00	17:51:00		47.6	70.1	52.6	41.9	47.5	70.1	52.6	41.9
	17:52:00	17:52:00		43.2	70.5	51.3	38.1	43.1	70.5	51.3	38.1
	17:53:00	17:53:00		43.8	71.9	54.1	38.5	43.8	71.9	54.1	38.5
	17:54:00	17:54:00		40	60.8	42.4	38.1	40	60.7	42.3	38.1
	17:55:00	17:55:00		41.4	65.4	45.4	37.9	41.4	65.4	45.4	37.9
	17:56:00	17:56:00		39.6	61.3	43.1	37.3	39.6	61.2	43.1	37.3
	17:57:00	17:57:00		43.1	62.2	47.8	38.2	43.1	62.2	47.8	38.2
	17:58:00	17:58:00		45.6	73.4	56.6	40	45.5	73.3	56.6	40
	17:59:00	17:59:00		52.4	75.2	58.3	41.8	52.3	75.1	58.2	41.8
	18:00:00	18:00:00		47.9	75.7	57.1	38.9	47.8	75.7	57	38.9
	18:01:00	18:01:00		44.8	72	53.9	40	44.7	72	53.9	40
	18:02:00	18:02:00		38.9	64.6	41.7	36.3	38.9	64.5	41.7	36.2
	18:03:00	18:03:00		41.7	63	46.8	38.1	41.7	62.8	46.7	38.1
	18:04:00	18:04:00		42	71.1	46.3	37.8	42	71.1	46.3	37.8
	18:05:00	18:05:00		44.8	68	49.3	38.6	44.8	68	49.2	38.6
	18:06:00	18:06:00		45.4	74.5	55.5	38.8	45.4	74.5	55.5	38.8
	18:07:00	18:07:00		53.5	76.9	57.8	46.2	53.5	76.9	57.8	46.1
	18:08:00	18:08:00		53.5	76.8	58.8	47	53.4	76.8	58.8	47
	18:09:00	18:09:00		48.8	75.9	57.1	37.7	48.8	75.9	57.1	37.6
	18:10:00	18:10:00		43.3	64.5	47.3	40.1	43.3	64.6	47.3	40

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
6:16 AM	10/22/2020	21379.6	53.3	213796.2	53.3	213796.2				
6:17 AM	10/22/2020	16982.4	52.3	169824.4	52.3	169824.4				
6:18 AM	10/22/2020	16982.4	52.3	169824.4	52.3	169824.4				
6:19 AM	10/22/2020	15488.2	51.9	154881.7	51.9	154881.7				
6:20 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
6:21 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
6:22 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
6:23 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
6:24 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
6:25 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
6:26 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
6:27 AM	10/22/2020	8128.3	49.1	81283.1	49.1	81283.1				
6:28 AM	10/22/2020	7762.5	48.9	77624.7	48.9	77624.7				
6:29 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
6:30 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
6:31 AM	10/22/2020	8709.6	49.4	87096.4	49.4	87096.4				
6:32 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
6:33 AM	10/22/2020	13803.8	51.4	138038.4	51.4	138038.4				
6:34 AM	10/22/2020	11749.0	50.7	117489.8	50.7	117489.8				
6:35 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
6:36 AM	10/22/2020	9549.9	49.8	95499.3	49.8	95499.3				
6:37 AM	10/22/2020	7244.4	48.6	72443.6	48.6	72443.6				
6:38 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
6:39 AM	10/22/2020	5248.1	47.2	52480.7	47.2	52480.7				
6:40 AM	10/22/2020	6760.8	48.3	67608.3	48.3	67608.3				
6:41 AM	10/22/2020	9120.1	49.6	91201.1	49.6	91201.1				
6:42 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
6:43 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
6:44 AM	10/22/2020	13182.6	51.2	131825.7	51.2	131825.7				
6:45 AM	10/22/2020	6918.3	48.4	69183.1	48.4	69183.1				
6:46 AM	10/22/2020	9332.5	49.7	93325.4	49.7	93325.4				
6:47 AM	10/22/2020	10715.2	50.3	107151.9	50.3	107151.9				
6:48 AM	10/22/2020	9772.4	49.9	97723.7	49.9	97723.7				
6:49 AM	10/22/2020	12882.5	51.1	128825.0	51.1	128825.0				
6:50 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
6:51 AM	10/22/2020	7079.5	48.5	70794.6	48.5	70794.6				
6:52 AM	10/22/2020	8912.5	49.5	89125.1	49.5	89125.1				
6:53 AM	10/22/2020	7943.3	49.0	79432.8	49.0	79432.8				
6:54 AM	10/22/2020	15135.6	51.8	151356.1	51.8	151356.1				
6:55 AM	10/22/2020	12589.3	51.0	125892.5	51.0	125892.5				
6:56 AM	10/22/2020	12022.6	50.8	120226.4	50.8	120226.4				
6:57 AM	10/22/2020	11481.5	50.6	114815.4	50.6	114815.4				
6:58 AM	10/22/2020	28840.3	54.6	288403.2	54.6	288403.2				
6:59 AM	10/22/2020	11220.2	50.5	112201.8	50.5	112201.8				
7:00 AM	10/22/2020	11748975.5	70.7	11748975.5	70.7	11748975.5				
7:01 AM	10/22/2020	33113.1	45.2	33113.1	45.2	33113.1				
7:02 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9				
7:03 AM	10/22/2020	10000.0	40.0	10000.0	40.0	10000.0				
7:04 AM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5				
7:05 AM	10/22/2020	8317.6	39.2	8317.6	39.2	8317.6				
7:06 AM	10/22/2020	234422.9	53.7	234422.9	53.7	234422.9				
7:07 AM	10/22/2020	251188.6	54.0	251188.6	54.0	251188.6				
7:08 AM	10/22/2020	39810.7	46.0	39810.7	46.0	39810.7				
7:09 AM	10/22/2020	436515.8	56.4	436515.8	56.4	436515.8				
7:10 AM	10/22/2020	213796.2	53.3	213796.2	53.3	213796.2				
7:11 AM	10/22/2020	933254.3	59.7	933254.3	59.7	933254.3				
7:12 AM	10/22/2020	1047128.5	60.2	1047128.5	60.2	1047128.5				
7:13 AM	10/22/2020	954992.6	59.8	954992.6	59.8	954992.6				
7:14 AM	10/22/2020	794328.2	59.0	794328.2	59.0	794328.2				
7:15 AM	10/22/2020	22387.2	43.5	22387.2	43.5	22387.2				
7:16 AM	10/22/2020	44668.4	46.5	44668.4	46.5	44668.4				
7:17 AM	10/22/2020	74131.0	48.7	74131.0	48.7	74131.0				
7:18 AM	10/22/2020	93325.4	49.7	93325.4	49.7	93325.4				
7:19 AM	10/22/2020	83176.4	49.2	83176.4	49.2	83176.4				
7:20 AM	10/22/2020	57544.0	47.6	57544.0	47.6	57544.0				
7:21 AM	10/22/2020	20893.0	43.2	20893.0	43.2	20893.0				
7:22 AM	10/22/2020	23988.3	43.8	23988.3	43.8	23988.3				
7:23 AM	10/22/2020	10000.0	40.0	10000.0	40.0	10000.0				
7:24 AM	10/22/2020	13803.8	41.4	13803.8	41.4	13803.8				
7:25 AM	10/22/2020	9120.1	39.6	9120.1	39.6	9120.1				
7:26 AM	10/22/2020	20417.4	43.1	20417.4	43.1	20417.4				
7:27 AM	10/22/2020	36307.8	45.6	36307.8	45.6	36307.8				
7:28 AM	10/22/2020	173780.1	52.4	173780.1	52.4	173780.1				
7:29 AM	10/22/2020	61659.5	47.9	61659.5	47.9	61659.5				
7:30 AM	10/22/2020	30199.5	44.8	30199.5	44.8	30199.5				
7:31 AM	10/22/2020	7762.5	38.9	7762.5	38.9	7762.5				
7:32 AM	10/22/2020	14791.1	41.7	14791.1	41.7	14791.1				
7:33 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9				
7:34 AM	10/22/2020	30199.5	44.8	30199.5	44.8	30199.5				
7:35 AM	10/22/2020	34673.7	45.4	34673.7	45.4	34673.7				
7:36 AM	10/22/2020	223872.1	53.5	223872.1	53.5	223872.1				
7:37 AM	10/22/2020	223872.1	53.5	223872.1	53.5	223872.1				
7:38 AM	10/22/2020	75857.8	48.8	75857.8	48.8	75857.8				
7:39 AM	10/22/2020	21379.6	43.3	21379.6	43.3	21379.6				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	18:11:00	18:11:00		40.2	71.4	43.6	37.5	40.2	71.4	43.5	37.4
	18:12:00	18:12:00		39.7	63.8	45.8	37.7	39.7	63.6	45.8	37.7
	18:13:00	18:13:00		40.6	65.4	48	36.9	40.6	65.4	48	36.9
	18:14:00	18:14:00		40.2	62.8	45.6	37.3	40.1	62.6	45.6	37.3
	18:15:00	18:15:00		39.3	65.9	43.4	37.5	39.3	65.8	43.3	37.5
	18:16:00	18:16:00		39.5	58.2	41.8	37.8	39.5	58.1	41.8	37.7
	18:17:00	18:17:00		39.2	63.4	42.5	37.5	39.2	63.4	42.5	37.4
	18:18:00	18:18:00		41	64	46.2	37.7	41	63.9	46.1	37.7
	18:19:00	18:19:00		40.3	62.6	43.6	38	40.3	62.4	43.6	37.9
	18:20:00	18:20:00		41	59.9	44.2	39	40.9	60.2	44.1	39
	18:21:00	18:21:00		42.1	65.2	45.9	40.1	42.1	65.4	45.9	40.1
	18:22:00	18:22:00		42.8	67	46	40.5	42.8	67	46	40.5
	18:23:00	18:23:00		42.8	64.6	45.6	41	42.8	64.5	45.5	41
	18:24:00	18:24:00		43	66.7	48.2	40.2	43	66.7	48.2	40.2
	18:25:00	18:25:00		42.3	68.4	46	40.4	42.3	68.4	46	40.3
	18:26:00	18:26:00		51.7	76.1	58.7	40.1	51.6	76.1	58.7	40
	18:27:00	18:27:00		56.8	79.4	60.9	42.6	56.8	79.4	60.9	42.6
	18:28:00	18:28:00		51	79.9	61.5	38.2	51	79.9	61.5	38.1
	18:29:00	18:29:00		44	71.2	51.6	38.4	44	71.2	51.6	38.4
	18:30:00	18:30:00		41.7	68.1	47.5	38.6	41.7	68.1	47.4	38.6
	18:31:00	18:31:00		47.5	71.9	54	38.7	47.5	71.9	54	38.7
	18:32:00	18:32:00		44.1	67.6	51.4	39.3	44.1	67.7	51.4	39.3
	18:33:00	18:33:00		40.7	65.2	46.5	38	40.6	65.3	46.5	38
	18:34:00	18:34:00		40.4	65	45.3	37.8	40.4	65	45.3	37.7
	18:35:00	18:35:00		41.1	64	44.7	39.1	41.1	63.9	44.7	39.1
	18:36:00	18:36:00		41.1	63.7	44.1	38.9	41	63.9	44.1	38.9
	18:37:00	18:37:00		40.7	65.2	44.5	39.1	40.6	65.2	44.4	39.1
	18:38:00	18:38:00		42	71.7	51.1	36.5	42	71.7	51.1	36.5
	18:39:00	18:39:00		38.4	67.7	40.9	36.8	38.4	67.7	40.9	36.7
	18:40:00	18:40:00		38.8	61.9	44.4	36.5	38.8	61.9	44.4	36.5
	18:41:00	18:41:00		39.4	70.3	49	35.9	39.4	70.3	49	35.9
	18:42:00	18:42:00		40.4	63.1	45	36.4	40.3	63	45	36.4
	18:43:00	18:43:00		40.6	61.9	45.5	37.8	40.6	61.8	45.5	37.8
	18:44:00	18:44:00		42.1	67.8	48.7	38.6	42.1	67.8	48.7	38.5
	18:45:00	18:45:00		39.7	60.7	43.2	37.3	39.6	60.6	43.2	37.3
	18:46:00	18:46:00		38.9	58.8	41.6	37.3	38.9	58.4	41.5	37.2
	18:47:00	18:47:00		41.4	63.4	46.3	38.2	41.3	63.3	46.3	38.1
	18:48:00	18:48:00		44	68.5	50.1	40	44	68.5	50.1	40
	18:49:00	18:49:00		45.8	69	50	41.7	45.8	69	50	41.7
	18:50:00	18:50:00		43.5	70.1	50.5	39.3	43.5	70	50.4	39.2
	18:51:00	18:51:00		42.3	67	51.9	39.4	42.3	67	51.9	39.3
	18:52:00	18:52:00		44.4	68.7	51.1	39.6	44.3	68.6	51.1	39.5
	18:53:00	18:53:00		42.4	64	46.3	38	42.4	64.1	46.3	38
	18:54:00	18:54:00		42.3	66.4	47.2	38.4	42.3	66.4	47.2	38.4
	18:55:00	18:55:00		43.7	68.8	49.3	39.5	43.7	68.7	49.3	39.4
	18:56:00	18:56:00		43.1	66.9	46.6	40.3	43.1	67.1	46.5	40.3
	18:57:00	18:57:00		42.4	64.4	47.4	38.6	42.4	64.5	47.3	38.6
	18:58:00	18:58:00		39.7	61.3	42.1	38.2	39.7	61	42.1	38.1
	18:59:00	18:59:00		39.3	57.1	41	37.4	39.3	57.5	41	37.3
	19:00:00	19:00:00		40	63.4	45.4	38.4	40	63.4	45.4	38.4
	19:01:00	19:01:00		40.8	66.7	48.4	35.8	40.8	66.6	48.4	35.8
	19:02:00	19:02:00		37.3	66.6	41.2	35.5	37.3	66.5	41.2	35.4
	19:03:00	19:03:00		39.4	68.5	43.7	36.4	39.4	68.5	43.7	36.4
	19:04:00	19:04:00		38.2	59.1	40	36.8	38.1	58.8	40	36.8
	19:05:00	19:05:00		38.9	64.1	41.4	37.4	38.9	64.2	41.4	37.4
	19:06:00	19:06:00		39.2	62.3	43.3	36.7	39.2	62.2	43.3	36.7
	19:07:00	19:07:00		38.6	69.9	45.4	36.3	38.5	69.9	45.4	36.2
	19:08:00	19:08:00		38.1	60.8	40.9	36.6	38.1	60.8	40.8	36.5
	19:09:00	19:09:00		37.8	57.9	41	35.6	37.8	58	40.9	35.6
	19:10:00	19:10:00		37	61.4	39.1	35.7	37	61.4	39	35.6
	19:11:00	19:11:00		37.3	61.4	42	35.4	37.3	61.6	42	35.4
	19:12:00	19:12:00		38.8	61.3	42.3	36.7	38.7	61.3	42.2	36.7
	19:13:00	19:13:00		38.2	62.8	42.9	35.6	38.2	62.7	42.9	35.6
	19:14:00	19:14:00		38.1	63.4	42.6	35.7	38	63.2	42.5	35.7
	19:15:00	19:15:00		36.7	60.4	39.8	35	36.7	60.4	39.8	34.9
	19:16:00	19:16:00		36.9	63.8	42.7	34.5	36.8	63.7	42.7	34.5
	19:17:00	19:17:00		39.3	67.6	48	35.3	39.2	67.6	47.9	35.3
	19:18:00	19:18:00		38.4	60.1	44	35.2	38.4	60	44	35.2
	19:19:00	19:19:00		37.7	63.8	41.9	35.7	37.6	63.8	41.9	35.6
	19:20:00	19:20:00		38	59.5	40.1	36	38	59.5	40	36
	19:21:00	19:21:00		37.1	58.6	39.6	35.3	37	58.9	39.6	35.2
	19:22:00	19:22:00		37.7	60.5	43.2	35.3	37.7	60.3	43.1	35.2
	19:23:00	19:23:00		36.1	54.7	38.1	34.9	36	54.8	38	34.9
	19:24:00	19:24:00		36.2	56.6	41.4	34.3	36.1	56.6	41.4	34.3
	19:25:00	19:25:00		36.4	57.8	41.5	34.2	36.4	58.1	41.4	34.2
	19:26:00	19:26:00		37.2	60.4	43.1	34.4	37.2	60.1	43	34.4
	19:27:00	19:27:00		41.2	74	52.1	34.2	41.2	74	52.1	34.2
	19:28:00	19:28:00		36.2	61.4	43.3	34.2	36.2	61.4	43.2	34.2
	19:29:00	19:29:00		35.7	57.9	39.7	33.8	35.7	57.9	39.7	33.7
	19:30:00	19:30:00		36.9	59.7	41.3	34.9	36.9	59.7	41.3	34.9
	19:31:00	19:31:00		37.9	62.2	43	36.2	37.9	62	43	36.2
	19:32:00	19:32:00		37.8	64.2	43.1	35.8	37.8	64	43.1	35.8
	19:33:00	19:33:00		37.8	64.8	43.3	35.1	37.7	64.7	43.3	35
	19:34:00	19:34:00		37.2	63.4	42.5	34.7	37.2	63.5	42.5	34.6

		24-Hour Data					15-Minute Data			
Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
7:40 AM	10/22/2020	10471.3	40.2	10471.3	40.2	10471.3				
7:41 AM	10/22/2020	9332.5	39.7	9332.5	39.7	9332.5				
7:42 AM	10/22/2020	11481.5	40.6	11481.5	40.6	11481.5				
7:43 AM	10/22/2020	10471.3	40.2	10471.3	40.2	10471.3				
7:44 AM	10/22/2020	8511.4	39.3	8511.4	39.3	8511.4				
7:45 AM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5				
7:46 AM	10/22/2020	8317.6	39.2	8317.6	39.2	8317.6				
7:47 AM	10/22/2020	12589.3	41.0	12589.3	41.0	12589.3				
7:48 AM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2				
7:49 AM	10/22/2020	12589.3	41.0	12589.3	41.0	12589.3				
7:50 AM	10/22/2020	16218.1	42.1	16218.1	42.1	16218.1				
7:51 AM	10/22/2020	19054.6	42.8	19054.6	42.8	19054.6				
7:52 AM	10/22/2020	19054.6	42.8	19054.6	42.8	19054.6				
7:53 AM	10/22/2020	19952.6	43.0	19952.6	43.0	19952.6				
7:54 AM	10/22/2020	16982.4	42.3	16982.4	42.3	16982.4				
7:55 AM	10/22/2020	147910.8	51.7	147910.8	51.7	147910.8				
7:56 AM	10/22/2020	478630.1	56.8	478630.1	56.8	478630.1				
7:57 AM	10/22/2020	125892.5	51.0	125892.5	51.0	125892.5				
7:58 AM	10/22/2020	25118.9	44.0	25118.9	44.0	25118.9				
7:59 AM	10/22/2020	14791.1	41.7	14791.1	41.7	14791.1				
8:00 AM	10/22/2020	56234.1	47.5	56234.1	47.5	56234.1				
8:01 AM	10/22/2020	25704.0	44.1	25704.0	44.1	25704.0				
8:02 AM	10/22/2020	11749.0	40.7	11749.0	40.7	11749.0				
8:03 AM	10/22/2020	10964.8	40.4	10964.8	40.4	10964.8				
8:04 AM	10/22/2020	12882.5	41.1	12882.5	41.1	12882.5				
8:05 AM	10/22/2020	12882.5	41.1	12882.5	41.1	12882.5				
8:06 AM	10/22/2020	11749.0	40.7	11749.0	40.7	11749.0				
8:07 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9				
8:08 AM	10/22/2020	6918.3	38.4	6918.3	38.4	6918.3				
8:09 AM	10/22/2020	7585.8	38.8	7585.8	38.8	7585.8				
8:10 AM	10/22/2020	8709.6	39.4	8709.6	39.4	8709.6				
8:11 AM	10/22/2020	10964.8	40.4	10964.8	40.4	10964.8				
8:12 AM	10/22/2020	11481.5	40.6	11481.5	40.6	11481.5				
8:13 AM	10/22/2020	16218.1	42.1	16218.1	42.1	16218.1				
8:14 AM	10/22/2020	9332.5	39.7	9332.5	39.7	9332.5				
8:15 AM	10/22/2020	7762.5	38.9	7762.5	38.9	7762.5				
8:16 AM	10/22/2020	13803.8	41.4	13803.8	41.4	13803.8				
8:17 AM	10/22/2020	25118.9	44.0	25118.9	44.0	25118.9				
8:18 AM	10/22/2020	38018.9	45.8	38018.9	45.8	38018.9				
8:19 AM	10/22/2020	22387.2	43.5	22387.2	43.5	22387.2				
8:20 AM	10/22/2020	16982.4	42.3	16982.4	42.3	16982.4				
8:21 AM	10/22/2020	27542.3	44.4	27542.3	44.4	27542.3				
8:22 AM	10/22/2020	17378.0	42.4	17378.0	42.4	17378.0				
8:23 AM	10/22/2020	16982.4	42.3	16982.4	42.3	16982.4				
8:24 AM	10/22/2020	23442.3	43.7	23442.3	43.7	23442.3				
8:25 AM	10/22/2020	20417.4	43.1	20417.4	43.1	20417.4				
8:26 AM	10/22/2020	17378.0	42.4	17378.0	42.4	17378.0				
8:27 AM	10/22/2020	9332.5	39.7	9332.5	39.7	9332.5				
8:28 AM	10/22/2020	8511.4	39.3	8511.4	39.3	8511.4				
8:29 AM	10/22/2020	10000.0	40.0	10000.0	40.0	10000.0				
8:30 AM	10/22/2020	12022.6	40.8	12022.6	40.8	12022.6				
8:31 AM	10/22/2020	5370.3	37.3	5370.3	37.3	5370.3				
8:32 AM	10/22/2020	8709.6	39.4	8709.6	39.4	8709.6				
8:33 AM	10/22/2020	6606.9	38.2	6606.9	38.2	6606.9				
8:34 AM	10/22/2020	7762.5	38.9	7762.5	38.9	7762.5				
8:35 AM	10/22/2020	8317.6	39.2	8317.6	39.2	8317.6				
8:36 AM	10/22/2020	7244.4	38.6	7244.4	38.6	7244.4				
8:37 AM	10/22/2020	6456.5	38.1	6456.5	38.1	6456.5				
8:38 AM	10/22/2020	6025.6	37.8	6025.6	37.8	6025.6				
8:39 AM	10/22/2020	5011.9	37.0	5011.9	37.0	5011.9				
8:40 AM	10/22/2020	5370.3	37.3	5370.3	37.3	5370.3				
8:41 AM	10/22/2020	7585.8	38.8	7585.8	38.8	7585.8				
8:42 AM	10/22/2020	6606.9	38.2	6606.9	38.2	6606.9				
8:43 AM	10/22/2020	6456.5	38.1	6456.5	38.1	6456.5				
8:44 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4				
8:45 AM	10/22/2020	4897.8	36.9	4897.8	36.9	4897.8				
8:46 AM	10/22/2020	8511.4	39.3	8511.4	39.3	8511.4				
8:47 AM	10/22/2020	6918.3	38.4	6918.3	38.4	6918.3				
8:48 AM	10/22/2020	5888.4	37.7	5888.4	37.7	5888.4				
8:49 AM	10/22/2020	6309.6	38.0	6309.6	38.0	6309.6				
8:50 AM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6				
8:51 AM	10/22/2020	5888.4	37.7	5888.4	37.7	5888.4				
8:52 AM	10/22/2020	4073.8	36.1	4073.8	36.1	4073.8				
8:53 AM	10/22/2020	4168.7	36.2	4168.7	36.2	4168.7				
8:54 AM	10/22/2020	4365.2	36.4	4365.2	36.4	4365.2				
8:55 AM	10/22/2020	5248.1	37.2	5248.1	37.2	5248.1				
8:56 AM	10/22/2020	13182.6	41.2	13182.6	41.2	13182.6				
8:57 AM	10/22/2020	4168.7	36.2	4168.7	36.2	4168.7				
8:58 AM	10/22/2020	3715.4	35.7	3715.4	35.7	3715.4				
8:59 AM	10/22/2020	4897.8	36.9	4897.8	36.9	4897.8				
9:00 AM	10/22/2020	6166.0	37.9	6166.0	37.9	6166.0				
9:01 AM	10/22/2020	6025.6	37.8	6025.6	37.8	6025.6				
9:02 AM	10/22/2020	6025.6	37.8	6025.6	37.8	6025.6				
9:03 AM	10/22/2020	5248.1	37.2	5248.1	37.2	5248.1				

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	19:35:00	19:35:00		44.2	70.7	49.1	37.5	44.2	70.7	49.1	37.5
	19:36:00	19:36:00		48.7	75.9	56.3	37.4	48.7	75.9	56.3	37.4
	19:37:00	19:37:00		52.1	76.6	57.2	43.5	52.1	76.6	57.1	43.5
	19:38:00	19:38:00		53.1	76.6	58	46.6	53.1	76.5	58	46.5
	19:39:00	19:39:00		43.4	74.6	55.7	35.9	43.4	74.5	55.7	35.9
	19:40:00	19:40:00		39.6	68	47.5	35.2	39.6	68	47.5	35.1
	19:41:00	19:41:00		38.5	69.8	44.1	35.2	38.5	69.8	44	35.2
	19:42:00	19:42:00		38.8	61.1	47.6	35	38.7	60.9	47.6	34.9
	19:43:00	19:43:00		42	67	49.9	35.3	41.9	66.9	49.9	35.2
	19:44:00	19:44:00		39	65.7	48.9	34.7	39	65.7	48.9	34.7
	19:45:00	19:45:00		37.7	66.3	44.3	35.3	37.6	66.2	44.3	35.3
	19:46:00	19:46:00		45.2	69.1	52.8	35.5	45.2	69.1	52.8	35.5
	19:47:00	19:47:00		41.6	66.9	46.8	36.1	41.6	66.8	46.8	36
	19:48:00	19:48:00		38.5	60.1	42.7	35.4	38.4	60.1	42.7	35.3
	19:49:00	19:49:00		43.5	65.8	48.3	37.6	43.5	66	48.2	37.6
	19:50:00	19:50:00		45.3	69.5	49.9	36.7	45.3	69.4	49.9	36.7
	19:51:00	19:51:00		44.6	68.6	52.1	37.2	44.6	68.6	52.1	37.2
	19:52:00	19:52:00		45.8	64.1	50.5	40.2	45.8	64.3	50.5	40.1
	19:53:00	19:53:00		46.3	64	53.2	39	46.2	64	53.2	39
	19:54:00	19:54:00		45.2	71.7	54	36.8	45.2	71.6	54	36.8
	19:55:00	19:55:00		50.7	75.1	55.7	42.6	50.6	75.1	55.7	42.6
	19:56:00	19:56:00		52.6	75.1	56.9	44.7	52.5	75.1	56.9	44.7
	19:57:00	19:57:00		46.3	70.2	52	38.1	46.2	70.1	52	38.1
	19:58:00	19:58:00		46.7	67.7	50.4	43	46.7	67.6	50.4	43
	19:59:00	19:59:00		45.1	72.8	49.6	38	45.1	72.7	49.6	38
	20:00:00	20:00:00		39	65.8	49.2	34.7	39	65.8	49.2	34.7
	20:01:00	20:01:00		38.4	61.3	42	35.9	38.4	61.2	42	35.9
	20:02:00	20:02:00		37.6	65.5	41	35.6	37.6	65.5	40.9	35.6
	20:03:00	20:03:00		36.8	57.8	40.5	35.3	36.8	57.7	40.4	35.3
	20:04:00	20:04:00		36.9	60.5	39.2	34.4	36.9	60.3	39.2	34.4
	20:05:00	20:05:00		37.1	62.9	42.6	34.2	37.1	62.8	42.5	34.2
	20:06:00	20:06:00		36.9	61	39.4	35	36.9	60.9	39.4	34.9
	20:07:00	20:07:00		38	67.2	43.2	36.1	38	67.2	43.2	36.1
	20:08:00	20:08:00		41.1	68.6	50.4	37.4	41.1	68.6	50.4	37.3
	20:09:00	20:09:00		40.2	65.3	45.2	36.5	40.2	65.3	45.2	36.5
	20:10:00	20:10:00		39.3	63.1	43.3	36.6	39.2	62.9	43.3	36.6
	20:11:00	20:11:00		37.1	65.1	41.1	35.3	37.1	65.1	41	35.3
	20:12:00	20:12:00		35.7	60.3	37.9	34.6	35.7	60.2	37.9	34.5
	20:13:00	20:13:00		38.5	62.9	43.3	34.8	38.4	62.9	43.3	34.7
	20:14:00	20:14:00		37.8	64.7	41.2	35.5	37.8	64.7	41.2	35.4
	20:15:00	20:15:00		38.4	62.8	42.2	36.2	38.4	62.7	42.2	36.1
	20:16:00	20:16:00		40.3	63.7	45	36.4	40.3	63.7	45	36.4
	20:17:00	20:17:00		46.5	71	52.4	37.8	46.5	70.9	52.3	37.8
	20:18:00	20:18:00		39.8	70.6	47.6	35.8	39.7	70.6	47.6	35.8
	20:19:00	20:19:00		40.4	60.8	44.5	36	40.4	60.7	44.5	35.9
	20:20:00	20:20:00		41.3	64	46.3	36.2	41.2	64	46.3	36.1
	20:21:00	20:21:00		44.9	69.8	51.3	39.3	44.9	69.8	51.3	39.3
	20:22:00	20:22:00		46.2	72.2	56	37.1	46.2	72.3	56	37.1
	20:23:00	20:23:00		40.3	62.7	44.4	36.5	40.3	62.7	44.3	36.4
	20:24:00	20:24:00		42	68.8	47.8	36.2	42	68.8	47.8	36.1
	20:25:00	20:25:00		40	65.7	44.6	35.9	40	65.7	44.6	35.8
	20:26:00	20:26:00		47.1	76.9	58.7	35.6	47.1	76.9	58.7	35.5
	20:27:00	20:27:00		37.6	61.6	42.9	34.5	37.5	61.5	42.8	34.4
	20:28:00	20:28:00		36.7	60.4	43.2	33.7	36.6	60.4	43.2	33.7
	20:29:00	20:29:00		42.1	70.3	53	35	42.1	70.3	52.9	35
	20:30:00	20:30:00		52.7	76.8	59	41.1	52.7	76.8	59	41.1
	20:31:00	20:31:00		37.3	64.2	45.8	34.3	37.3	64.2	45.8	34.3
	20:32:00	20:32:00		38.9	66.7	43.6	34.6	38.9	66.7	43.6	34.6
	20:33:00	20:33:00		37.5	66.5	47.3	33.1	37.5	66.5	47.2	33
	20:34:00	20:34:00		36.6	63	42.8	34	36.6	63	42.8	34
	20:35:00	20:35:00		37.4	60.2	42.6	34.3	37.3	60	42.6	34.2
	20:36:00	20:36:00		40.6	70	51.7	32.1	40.6	69.9	51.7	32.1
	20:37:00	20:37:00		35.5	61.3	41.2	31.9	35.4	61	41.1	31.9
	20:38:00	20:38:00		35.3	67.3	44.4	31.8	35.2	67.3	44.4	31.7
	20:39:00	20:39:00		36.4	65.1	44.6	32.4	36.3	65.1	44.6	32.3
	20:40:00	20:40:00		36.7	63.7	44.8	32.4	36.6	63.6	44.8	32.3
	20:41:00	20:41:00		35.9	62.1	44.7	31.8	35.9	62	44.6	31.7
	20:42:00	20:42:00		36.4	63.2	45.3	31.8	36.4	63.2	45.3	31.8
	20:43:00	20:43:00		36.5	64.3	42.5	31.5	36.5	64.1	42.5	31.5
	20:44:00	20:44:00		37.2	66.5	42.4	32.8	37.2	66.5	42.4	32.8
	20:45:00	20:45:00		38.7	62.6	46.7	32.4	38.7	62.6	46.7	32.4
	20:46:00	20:46:00		36.1	62.3	40.4	31.1	36.1	62.1	40.3	31.1
	20:47:00	20:47:00		35.2	65.2	40.7	32.2	35.2	65.2	40.7	32.1
	20:48:00	20:48:00		34.7	67.5	42.6	31.5	34.7	67.4	42.6	31.4
	20:49:00	20:49:00		36.5	68.8	44.6	31.3	36.5	68.8	44.6	31.3
	20:50:00	20:50:00		33.2	63.5	37	30.6	33.1	63.3	37	30.6
	20:51:00	20:51:00		34.1	64	40.8	30.9	34	64	40.8	30.9
	20:52:00	20:52:00		34.5	56.7	37	31.7	34.4	56.4	37	31.7
	20:53:00	20:53:00		34.4	59.4	39.9	31.4	34.4	59.3	39.9	31.4
	20:54:00	20:54:00		37.2	64.8	43.7	32.3	37.2	64.7	43.7	32.2
	20:55:00	20:55:00		36.8	65.7	45.3	32.6	36.7	65.6	45.3	32.5
	20:56:00	20:56:00		34.8	59.3	39	31.5	34.8	59.3	39	31.5
	20:57:00	20:57:00		33.7	56.8	38.6	30.6	33.6	56.6	38.6	30.5
	20:58:00	20:58:00		33	54.7	40.1	30.7	33	54.7	40.1	30.6

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
	9:04 AM	10/22/2020	26302.7	44.2	26302.7	44.2	26302.7				
	9:05 AM	10/22/2020	74131.0	48.7	74131.0	48.7	74131.0				
	9:06 AM	10/22/2020	162181.0	52.1	162181.0	52.1	162181.0				
	9:07 AM	10/22/2020	204173.8	53.1	204173.8	53.1	204173.8				
	9:08 AM	10/22/2020	21877.6	43.4	21877.6	43.4	21877.6				
	9:09 AM	10/22/2020	9120.1	39.6	9120.1	39.6	9120.1				
	9:10 AM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5				
	9:11 AM	10/22/2020	7585.8	38.8	7585.8	38.8	7585.8				
	9:12 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9				
	9:13 AM	10/22/2020	7943.3	39.0	7943.3	39.0	7943.3				
	9:14 AM	10/22/2020	5888.4	37.7	5888.4	37.7	5888.4				
	9:15 AM	10/22/2020	33113.1	45.2	33113.1	45.2	33113.1				
	9:16 AM	10/22/2020	14454.4	41.6	14454.4	41.6	14454.4				
	9:17 AM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5				
	9:18 AM	10/22/2020	22387.2	43.5	22387.2	43.5	22387.2				
	9:19 AM	10/22/2020	33884.4	45.3	33884.4	45.3	33884.4				
	9:20 AM	10/22/2020	28840.3	44.6	28840.3	44.6	28840.3				
	9:21 AM	10/22/2020	38018.9	45.8	38018.9	45.8	38018.9				
	9:22 AM	10/22/2020	42658.0	46.3	42658.0	46.3	42658.0				
	9:23 AM	10/22/2020	33113.1	45.2	33113.1	45.2	33113.1				
	9:24 AM	10/22/2020	117489.8	50.7	117489.8	50.7	117489.8				
	9:25 AM	10/22/2020	181970.1	52.6	181970.1	52.6	181970.1				
	9:26 AM	10/22/2020	42658.0	46.3	42658.0	46.3	42658.0				
	9:27 AM	10/22/2020	46773.5	46.7	46773.5	46.7	46773.5				
	9:28 AM	10/22/2020	32359.4	45.1	32359.4	45.1	32359.4				
	9:29 AM	10/22/2020	7943.3	39.0	7943.3	39.0	7943.3				
	9:30 AM	10/22/2020	6918.3	38.4	6918.3	38.4	6918.3				
	9:31 AM	10/22/2020	5754.4	37.6	5754.4	37.6	5754.4				
	9:32 AM	10/22/2020	4786.3	36.8	4786.3	36.8	4786.3				
	9:33 AM	10/22/2020	4897.8	36.9	4897.8	36.9	4897.8				
	9:34 AM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6				
	9:35 AM	10/22/2020	4897.8	36.9	4897.8	36.9	4897.8				
	9:36 AM	10/22/2020	6309.6	38.0	6309.6	38.0	6309.6				
	9:37 AM	10/22/2020	12882.5	41.1	12882.5	41.1	12882.5				
	9:38 AM	10/22/2020	10471.3	40.2	10471.3	40.2	10471.3				
	9:39 AM	10/22/2020	8511.4	39.3	8511.4	39.3	8511.4				
	9:40 AM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6				
	9:41 AM	10/22/2020	3715.4	35.7	3715.4	35.7	3715.4				
	9:42 AM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5				
	9:43 AM	10/22/2020	6025.6	37.8	6025.6	37.8	6025.6				
	9:44 AM	10/22/2020	6918.3	38.4	6918.3	38.4	6918.3				
	9:45 AM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2				
	9:46 AM	10/22/2020	44668.4	46.5	44668.4	46.5	44668.4				
	9:47 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9				
	9:48 AM	10/22/2020	10964.8	40.4	10964.8	40.4	10964.8				
	9:49 AM	10/22/2020	13489.6	41.3	13489.6	41.3	13489.6				
	9:50 AM	10/22/2020	30903.0	44.9	30903.0	44.9	30903.0				
	9:51 AM	10/22/2020	41686.9	46.2	41686.9	46.2	41686.9				
	9:52 AM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2				
	9:53 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9				
	9:54 AM	10/22/2020	10000.0	40.0	10000.0	40.0	10000.0				
	9:55 AM	10/22/2020	51286.1	47.1	51286.1	47.1	51286.1				
	9:56 AM	10/22/2020	5754.4	37.6	5754.4	37.6	5754.4				
	9:57 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4				
	9:58 AM	10/22/2020	16218.1	42.1	16218.1	42.1	16218.1				
	9:59 AM	10/22/2020	186208.7	52.7	186208.7	52.7	186208.7				
	10:00 AM	10/22/2020	5370.3	37.3	5370.3	37.3	5370.3				
	10:01 AM	10/22/2020	7762.5	38.9	7762.5	38.9	7762.5				
	10:02 AM	10/22/2020	5623.4	37.5	5623.4	37.5	5623.4				
	10:03 AM	10/22/2020	4570.9	36.6	4570.9	36.6	4570.9				
	10:04 AM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4				
	10:05 AM	10/22/2020	11481.5	40.6	11481.5	40.6	11481.5				
	10:06 AM	10/22/2020	3548.1	35.5	3548.1	35.5	3548.1				
	10:07 AM	10/22/2020	3388.4	35.3	3388.4	35.3	3388.4				
	10:08 AM	10/22/2020	4365.2	36.4	4365.2	36.4	4365.2				
	10:09 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4				
	10:10 AM	10/22/2020	3890.5	35.9	3890.5	35.9	3890.5				
	10:11 AM	10/22/2020	4365.2	36.4	4365.2	36.4	4365.2				
	10:12 AM	10/22/2020	4466.8	36.5	4466.8	36.5	4466.8				
	10:13 AM	10/22/2020	5248.1	37.2	5248.1	37.2	5248.1				
	10:14 AM	10/22/2020	7413.1	38.7	7413.1	38.7	7413.1				
	10:15 AM	10/22/2020	4073.8	36.1	4073.8	36.1	4073.8				
	10:16 AM	10/22/2020	3311.3	35.2	3311.3	35.2	3311.3				
	10:17 AM	10/22/2020	2951.2	34.7	2951.2	34.7	2951.2				
	10:18 AM	10/22/2020	4466.8	36.5	4466.8	36.5	4466.8				
	10:19 AM	10/22/2020	2089.3	33.2	2089.3	33.2	2089.3				
	10:20 AM	10/22/2020	2570.4	34.1	2570.4	34.1	2570.4				
	10:21 AM	10/22/2020	2818.4	34.5	2818.4	34.5	2818.4				
	10:22 AM	10/22/2020	2754.2	34.4	2754.2	34.4	2754.2				
	10:23 AM	10/22/2020	5248.1	37.2	5248.1	37.2	5248.1				
	10:24 AM	10/22/2020	4786.3	36.8	4786.3	36.8	4786.3				
	10:25 AM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0				
Study #9	10:26 AM	10/22/2020	2344.2	33.7	2344.2	33.7	2344.2	40.5	11220.2	40.5	11220.2
Study #9	10:27 AM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3	32.1	1621.8	32.1	1621.8

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	20:59:00	20:59:00		34.8	61.5	43.1	30.9	34.8	61.5	43.1	30.8
	21:00:00	21:00:00		40.3	70.5	51.3	31.4	40.3	70.5	51.3	31.3
	21:01:00	21:01:00		58.1	80	63.5	37.4	58.1	80	63.5	37.4
	21:02:00	21:02:00		53	78.8	59.5	34.7	53	78.8	59.5	34.6
	21:03:00	21:03:00		53.6	79.9	60.3	38.7	53.5	79.9	60.2	38.7
	21:04:00	21:04:00		42.4	68.4	49.9	31.3	42.4	68.4	49.9	31.3
	21:05:00	21:05:00		42	71.1	52.9	33	41.9	71.1	52.8	33
	21:06:00	21:06:00		40.6	67.4	49.2	32.9	40.5	67.3	49.2	32.8
	21:07:00	21:07:00		40.4	67.7	49	32.9	40.4	67.8	49	32.8
	21:08:00	21:08:00		36.2	62.3	40.9	32.3	36.1	62.2	40.9	32.2
	21:09:00	21:09:00		39.8	68.2	45.4	33.2	39.7	68.2	45.4	33.1
	21:10:00	21:10:00		37.4	65.3	42.3	32.4	37.4	65.2	42.2	32.4
	21:11:00	21:11:00		41.2	69.1	48.6	36.1	41.2	69.1	48.5	36.1
	21:12:00	21:12:00		44.1	66.2	47.4	39	44.1	66.2	47.3	39
	21:13:00	21:13:00		40.3	67.5	47.2	34	40.3	67.5	47.2	33.9
	21:14:00	21:14:00		36.7	67.9	43.2	30.7	36.6	67.9	43.1	30.6
	21:15:00	21:15:00		38	68.1	46.4	30.2	38	68.1	46.3	30.2
	21:16:00	21:16:00		35.4	57.8	41.8	30.7	35.3	58	41.8	30.7
	21:17:00	21:17:00		34.8	58.9	38.9	30.7	34.8	58.9	38.9	30.6
	21:18:00	21:18:00		34.4	60.5	37.7	31.9	34.4	60.3	37.7	31.9
	21:19:00	21:19:00		34.6	59.4	39	30.4	34.5	59.2	38.9	30.3
	21:20:00	21:20:00		39	61.5	42.8	32.3	38.9	61.6	42.8	32.2
	21:21:00	21:21:00		37.1	67	46.1	30.3	37.1	67	46	30.3
	21:22:00	21:22:00		38.5	66.1	46.7	32.5	38.4	66.1	46.7	32.5
	21:23:00	21:23:00		36.1	68.1	43.1	30.8	36.1	67.9	43.1	30.7
	21:24:00	21:24:00		35	59.2	38.4	31.2	34.9	59.3	38.3	31.2
	21:25:00	21:25:00		35.7	66.6	38.1	32	35.7	66.5	38	32
	21:26:00	21:26:00		35.8	60.5	42	32.1	35.7	60.4	42	32
	21:27:00	21:27:00		35.8	56.8	38.3	32	35.8	57.1	38.2	32
	21:28:00	21:28:00		39.7	65.2	45.3	33.1	39.7	65.2	45.3	33
	21:29:00	21:29:00		37.7	60.2	43.7	31.2	37.7	60.2	43.7	31.1
	21:30:00	21:30:00		36.5	64.7	47.3	30.8	36.4	64.7	47.3	30.7
	21:31:00	21:31:00		32	57.9	35.3	30.6	32	57.9	35.3	30.5
	21:32:00	21:32:00		33.3	59.1	38.3	30.7	33.3	59.2	38.3	30.6
	21:33:00	21:33:00		33	60.9	39.3	31	33	60.8	39.3	30.9
	21:34:00	21:34:00		35.1	60.5	39.9	32	35	60.3	39.8	31.9
	21:35:00	21:35:00		38.6	67.9	44.4	31.9	38.6	67.9	44.4	31.9
	21:36:00	21:36:00		34.1	58.4	41.6	32.1	34.1	58	41.6	32.1
	21:37:00	21:37:00		36.7	64.3	49.8	30.4	36.7	64.3	49.8	30.4
	21:38:00	21:38:00		36.8	60.4	46.1	31.7	36.8	60.1	46	31.6
	21:39:00	21:39:00		35.2	58.8	43.5	30.5	35.1	58.7	43.5	30.4
	21:40:00	21:40:00		37	57.7	41.5	32.9	37	57.7	41.4	32.8
	21:41:00	21:41:00		36.1	61.3	41.5	31.5	36	61.5	41.5	31.4
	21:42:00	21:42:00		34.6	54.8	37.7	31.6	34.6	54.7	37.7	31.6
	21:43:00	21:43:00		32.6	57.7	38.2	30.3	32.6	57.5	38.2	30.2
	21:44:00	21:44:00		35.3	63	42.3	30.8	35.3	62.8	42.3	30.8
	21:45:00	21:45:00		33.6	54.7	38.4	31.3	33.5	54.7	38.4	31.3
	21:46:00	21:46:00		33.4	52.9	36.3	30.8	33.4	52.5	36.3	30.8
	21:47:00	21:47:00		34.1	63.8	39.4	30.7	34.1	63.8	39.4	30.6
	21:48:00	21:48:00		36.4	65.3	49.9	30.6	36.4	65.3	49.9	30.5
	21:49:00	21:49:00		35.1	72.3	43.3	30.2	35.1	72.2	43.3	30.2
	21:50:00	21:50:00		35	58.8	38.9	31	35	58.9	38.9	31
	21:51:00	21:51:00		36.1	61.4	44.1	30.7	36.1	61.6	44.1	30.6
	21:52:00	21:52:00		34.9	57	42	31.8	34.8	56.8	42	31.8
	21:53:00	21:53:00		34.5	56.1	38.9	31	34.5	56.4	38.8	31
	21:54:00	21:54:00		33.9	69.5	44.2	30.9	33.8	69.5	44.2	30.8
	21:55:00	21:55:00		35.4	65.9	43	31.8	35.4	65.8	43	31.8
	21:56:00	21:56:00		35.8	61.1	43.3	31.7	35.8	61	43.3	31.6
	21:57:00	21:57:00		34.8	57	40	32	34.8	56.8	40	32
	21:58:00	21:58:00		36.6	57.9	43.5	32.6	36.6	57.9	43.5	32.6
	21:59:00	21:59:00		38.5	67.7	44.8	32.1	38.5	67.6	44.8	32.1
	22:00:00	22:00:00		36.9	63.1	43.6	31.5	36.9	63	43.5	31.5
	22:01:00	22:01:00		35	63.6	41.3	30.9	35	63.7	41.2	30.9
	22:02:00	22:02:00		32.5	61	40.8	30.3	32.5	60.9	40.7	30.3
	22:03:00	22:03:00		33.1	62.1	39.6	30.8	33.1	62	39.5	30.7
	22:04:00	22:04:00		33.5	61.4	40.8	31.5	33.5	61.3	40.7	31.5
	22:05:00	22:05:00		35.9	62.4	44.1	31.4	35.9	62.4	44.1	31.4
	22:06:00	22:06:00		39.6	70	50	30.4	39.6	70	50	30.4
	22:07:00	22:07:00		32.4	56.1	39.7	30.3	32.3	56.1	39.6	30.3
	22:08:00	22:08:00		35.2	63.1	42.5	30.5	35.2	63	42.5	30.5
	22:09:00	22:09:00		32.9	58.1	35.5	30.8	32.9	58.3	35.5	30.8
	22:10:00	22:10:00		32.8	56.8	37.9	30.5	32.8	56.7	37.8	30.5
	22:11:00	22:11:00		33.8	59.2	37.7	31.5	33.8	59.1	37.7	31.5
	22:12:00	22:12:00		35	64.6	41.9	30.7	34.9	64.5	41.9	30.7
	22:13:00	22:13:00		43	68.1	53.7	31.2	43	68.1	53.7	31.2
	22:14:00	22:14:00		34.6	58.4	37.5	31.8	34.5	58.3	37.4	31.8
	22:15:00	22:15:00		42.4	85.6	53.1	31.1	42.4	85.6	53	31
	22:16:00	22:16:00		42.5	71.1	54.2	30.3	42.5	71.1	54.2	30.3
	22:17:00	22:17:00		33.3	59.1	39	30	33.2	59	39	29.9
	22:18:00	22:18:00		31.8	58.4	35.4	30.3	31.8	58.2	35.4	30.2
	22:19:00	22:19:00		32.6	60.6	36.9	30.4	32.6	60.7	36.9	30.4
	22:20:00	22:20:00		38.7	66.6	46.7	31.1	38.6	66.6	46.6	31
	22:21:00	22:21:00		42	68.3	47.8	34.1	42	68.2	47.8	34
	22:22:00	22:22:00		40.7	68.6	49.6	31.3	40.7	68.6	49.5	31.3

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #9	10:28 AM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0	32.7	1862.1	32.7	1862.1
Study #9	10:29 AM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2	33.3	2138.0	33.3	2138.0
Study #9	10:30 AM	10/22/2020	645654.2	58.1	645654.2	58.1	645654.2	32.5	1778.3	32.5	1778.3
Study #9	10:31 AM	10/22/2020	199526.2	53.0	199526.2	53.0	199526.2	32.9	1949.8	32.9	1949.8
Study #9	10:32 AM	10/22/2020	229086.8	53.6	229086.8	53.6	229086.8	55.6	363078.1	55.6	363078.1
Study #9	10:33 AM	10/22/2020	17378.0	42.4	17378.0	42.4	17378.0	58.4	691831.0	58.4	691831.0
Study #9	10:34 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9	34.4	2754.2	34.4	2754.2
Study #9	10:35 AM	10/22/2020	11481.5	40.6	11481.5	40.6	11481.5	35.6	3630.8	35.6	3630.8
Study #9	10:36 AM	10/22/2020	10964.8	40.4	10964.8	40.4	10964.8	31.7	1479.1	31.7	1479.1
Study #9	10:37 AM	10/22/2020	4168.7	36.2	4168.7	36.2	4168.7	32.8	1905.5	32.8	1905.5
Study #9	10:38 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9	32.0	1584.9	32.0	1584.9
Study #9	10:39 AM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4	37.4	5495.4	37.4	5495.4
Study #9	10:40 AM	10/22/2020	13182.6	41.2	13182.6	41.2	13182.6	31.1	1288.2	31.1	1288.2
	10:41 AM	10/22/2020	25704.0	44.1	25704.0	44.1	25704.0				
	10:42 AM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2				
	10:43 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4				
	10:44 AM	10/22/2020	6309.6	38.0	6309.6	38.0	6309.6				
	10:45 AM	10/22/2020	3467.4	35.4	3467.4	35.4	3467.4				
	10:46 AM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0				
	10:47 AM	10/22/2020	2754.2	34.4	2754.2	34.4	2754.2				
	10:48 AM	10/22/2020	2884.0	34.6	2884.0	34.6	2884.0				
	10:49 AM	10/22/2020	7943.3	39.0	7943.3	39.0	7943.3				
	10:50 AM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6				
	10:51 AM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5				
	10:52 AM	10/22/2020	4073.8	36.1	4073.8	36.1	4073.8				
Study #10	10:53 AM	10/22/2020	3162.3	35.0	3162.3	35.0	3162.3	40.9	12302.7	40.9	12302.7
Study #10	10:54 AM	10/22/2020	3715.4	35.7	3715.4	35.7	3715.4	39.9	9772.4	39.9	9772.4
Study #10	10:55 AM	10/22/2020	3801.9	35.8	3801.9	35.8	3801.9	38.6	7244.4	38.6	7244.4
Study #10	10:56 AM	10/22/2020	3801.9	35.8	3801.9	35.8	3801.9	41.3	13489.6	41.3	13489.6
Study #10	10:57 AM	10/22/2020	9332.5	39.7	9332.5	39.7	9332.5	39.5	8912.5	39.5	8912.5
Study #10	10:58 AM	10/22/2020	5888.4	37.7	5888.4	37.7	5888.4	37.4	5495.4	37.4	5495.4
Study #10	10:59 AM	10/22/2020	4466.8	36.5	4466.8	36.5	4466.8	39.8	9549.9	39.8	9549.9
Study #10	11:00 AM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9	44.2	26302.7	44.2	26302.7
Study #10	11:01 AM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0	39.4	8709.6	39.4	8709.6
Study #10	11:02 AM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3	40.5	11220.2	40.5	11220.2
Study #10	11:03 AM	10/22/2020	3235.9	35.1	3235.9	35.1	3235.9	38.3	6760.8	38.3	6760.8
Study #10	11:04 AM	10/22/2020	7244.4	38.6	7244.4	38.6	7244.4	58.2	660693.4	58.2	660693.4
Study #10	11:05 AM	10/22/2020	2570.4	34.1	2570.4	34.1	2570.4	40.7	11749.0	40.7	11749.0
Study #10	11:06 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4	41.8	15135.6	41.8	15135.6
Study #10	11:07 AM	10/22/2020	4786.3	36.8	4786.3	36.8	4786.3	38.3	6760.8	38.3	6760.8
	11:08 AM	10/22/2020	3311.3	35.2	3311.3	35.2	3311.3				
	11:09 AM	10/22/2020	5011.9	37.0	5011.9	37.0	5011.9				
	11:10 AM	10/22/2020	4073.8	36.1	4073.8	36.1	4073.8				
	11:11 AM	10/22/2020	2884.0	34.6	2884.0	34.6	2884.0				
	11:12 AM	10/22/2020	1819.7	32.6	1819.7	32.6	1819.7				
	11:13 AM	10/22/2020	3388.4	35.3	3388.4	35.3	3388.4				
	11:14 AM	10/22/2020	2290.9	33.6	2290.9	33.6	2290.9				
	11:15 AM	10/22/2020	2187.8	33.4	2187.8	33.4	2187.8				
	11:16 AM	10/22/2020	2570.4	34.1	2570.4	34.1	2570.4				
	11:17 AM	10/22/2020	4365.2	36.4	4365.2	36.4	4365.2				
	11:18 AM	10/22/2020	3235.9	35.1	3235.9	35.1	3235.9				
Study #11	11:19 AM	10/22/2020	3162.3	35.0	3162.3	35.0	3162.3	41.7	14791.1	41.7	14791.1
Study #11	11:20 AM	10/22/2020	4073.8	36.1	4073.8	36.1	4073.8	38.0	6309.6	38.0	6309.6
Study #11	11:21 AM	10/22/2020	3090.3	34.9	3090.3	34.9	3090.3	37.9	6166.0	37.9	6166.0
Study #11	11:22 AM	10/22/2020	2818.4	34.5	2818.4	34.5	2818.4	39.8	9549.9	39.8	9549.9
Study #11	11:23 AM	10/22/2020	2454.7	33.9	2454.7	33.9	2454.7	40.0	10000.0	40.0	10000.0
Study #11	11:24 AM	10/22/2020	3467.4	35.4	3467.4	35.4	3467.4	42.7	18620.9	42.7	18620.9
Study #11	11:25 AM	10/22/2020	3801.9	35.8	3801.9	35.8	3801.9	43.2	20893.0	43.2	20893.0
Study #11	11:26 AM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0	42.6	18197.0	42.6	18197.0
Study #11	11:27 AM	10/22/2020	4570.9	36.6	4570.9	36.6	4570.9	43.3	21379.6	43.3	21379.6
Study #11	11:28 AM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5	43.2	20893.0	43.2	20893.0
Study #11	11:29 AM	10/22/2020	4897.8	36.9	4897.8	36.9	4897.8	41.6	14454.4	41.6	14454.4
Study #11	11:30 AM	10/22/2020	3162.3	35.0	3162.3	35.0	3162.3	60.1	1023293.0	60.1	1023293.0
Study #11	11:31 AM	10/22/2020	1778.3	32.5	1778.3	32.5	1778.3	46.3	42658.0	46.3	42658.0
Study #11	11:32 AM	10/22/2020	2041.7	33.1	2041.7	33.1	2041.7	36.7	4677.4	36.7	4677.4
Study #11	11:33 AM	10/22/2020	2238.7	33.5	2238.7	33.5	2238.7	35.5	3548.1	35.5	3548.1
	11:34 AM	10/22/2020	3890.5	35.9	3890.5	35.9	3890.5				
	11:35 AM	10/22/2020	9120.1	39.6	9120.1	39.6	9120.1				
	11:36 AM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8				
	11:37 AM	10/22/2020	3311.3	35.2	3311.3	35.2	3311.3				
	11:38 AM	10/22/2020	1949.8	32.9	1949.8	32.9	1949.8				
	11:39 AM	10/22/2020	1905.5	32.8	1905.5	32.8	1905.5				
	11:40 AM	10/22/2020	2398.8	33.8	2398.8	33.8	2398.8				
Study #12	11:41 AM	10/22/2020	3162.3	35.0	3162.3	35.0	3162.3	39.5	8912.5	39.5	8912.5
Study #12	11:42 AM	10/22/2020	19952.6	43.0	19952.6	43.0	19952.6	38.7	7413.1	38.7	7413.1
Study #12	11:43 AM	10/22/2020	2884.0	34.6	2884.0	34.6	2884.0	41.9	15488.2	41.9	15488.2
Study #12	11:44 AM	10/22/2020	17378.0	42.4	17378.0	42.4	17378.0	29.5	891.3	29.5	891.3
Study #12	11:45 AM	10/22/2020	17782.8	42.5	17782.8	42.5	17782.8	28.8	758.6	28.8	758.6
Study #12	11:46 AM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0	29.1	812.8	29.1	812.8
Study #12	11:47 AM	10/22/2020	1513.6	31.8	1513.6	31.8	1513.6	29.2	831.8	29.2	831.8
Study #12	11:48 AM	10/22/2020	1819.7	32.6	1819.7	32.6	1819.7	29.3	851.1	29.3	851.1
Study #12	11:49 AM	10/22/2020	7413.1	38.7	7413.1	38.7	7413.1	31.8	1513.6	31.8	1513.6
Study #12	11:50 AM	10/22/2020	15848.9	42.0	15848.9	42.0	15848.9	33.6	2290.9	33.6	2290.9
Study #12	11:51 AM	10/22/2020	11749.0	40.7	11749.0	40.7	11749.0	32.7	1862.1	32.7	1862.1

Study	Study	Session	OL	L_{avg}	L_{pk}	L_{max}	L_{min}	L_{avg}	L_{pk}	L_{max}	L_{min}
	Time	Time	Status	Meter 1	Meter 1	Meter 1	Meter 1	Meter 2	Meter 2	Meter 2	Meter 2
	22:23:00	22:23:00		32.1	59	34.9	30.8	32	58.9	34.8	30.8
	22:24:00	22:24:00		32.6	58.8	38.8	31	32.6	58.6	38.8	30.9
	22:25:00	22:25:00		32.7	57.7	37.5	30.2	32.6	57.6	37.5	30.2
	22:26:00	22:26:00		31.6	60.1	35.5	29.8	31.5	59.9	35.5	29.8
	22:27:00	22:27:00		33.3	61.5	44.1	29.9	33.2	61.6	44.1	29.9
	22:28:00	22:28:00		31.6	57.3	37.7	29.8	31.6	57.3	37.6	29.8
	22:29:00	22:29:00		39.8	70.6	51.8	30.3	39.7	70.5	51.7	30.3
	22:30:00	22:30:00		35.4	63	41	30.5	35.4	62.9	41	30.4
	22:31:00	22:31:00		34.8	64.6	42.7	30.3	34.7	64.5	42.6	30.3
	22:32:00	22:32:00		36.7	64.6	43.6	30.6	36.6	64.5	43.6	30.5
	22:33:00	22:33:00		32.1	56	34.7	30.6	32.1	55.9	34.7	30.5
	22:34:00	22:34:00		33.2	59.1	38	30.9	33.2	58.8	38	30.8
	22:35:00	22:35:00		34.7	68.1	45.5	31.3	34.6	68.1	45.4	31.2
	22:36:00	22:36:00		33.6	56.1	36.7	31.8	33.6	56.3	36.7	31.7
	22:37:00	22:37:00		32.4	56.1	37	30.7	32.4	56.3	36.9	30.6
	22:38:00	22:38:00		33.1	62.7	36.7	30.7	33	62.6	36.7	30.6
	22:39:00	22:39:00		33.6	56.4	38.8	31.3	33.6	56.3	38.8	31.2
	22:40:00	22:40:00		34.8	62.2	40.8	31.4	34.8	62.1	40.8	31.4
	22:41:00	22:41:00		37.9	63.1	42.2	33.3	37.9	63.1	42.2	33.3
	22:42:00	22:42:00		38.5	66.4	44.4	32	38.4	66.4	44.4	31.9
	22:43:00	22:43:00		32.9	64	40.6	30.1	32.8	64	40.6	30.1
	22:44:00	22:44:00		43.8	70	51	32.3	43.7	69.9	51	32.3
	22:45:00	22:45:00		43.4	70.2	50.8	31.3	43.4	70.2	50.8	31.3
	22:46:00	22:46:00		35.8	64.7	45.1	30.3	35.8	64.9	45.1	30.3
	22:47:00	22:47:00		36	61.3	42	29.9	35.9	61.1	42	29.9
	22:48:00	22:48:00		38.1	64.1	44.4	31.7	38.1	64.1	44.4	31.7
	22:49:00	22:49:00		33.7	56	42.3	30.1	33.7	56	42.3	30.1
	22:50:00	22:50:00		33.8	65.5	40.3	29.5	33.8	65.5	40.3	29.5
	22:51:00	22:51:00		33.3	59.7	39.7	29.6	33.3	59.6	39.7	29.5
	22:52:00	22:52:00		34.9	61.2	39.8	30.6	34.9	61.1	39.7	30.5
	22:53:00	22:53:00		37.4	62.5	41.1	31.9	37.3	62.8	41.1	31.8
	22:54:00	22:54:00		41.2	67.2	46.3	33.8	41.2	67.3	46.2	33.7
	22:55:00	22:55:00		34.2	63.6	43.1	31.3	34.1	63.6	43.1	31.3
	22:56:00	22:56:00		33.3	56.1	39.3	29.8	33.2	56.3	39.3	29.8
	22:57:00	22:57:00		30.8	54.4	35.5	29.5	30.8	54.4	35.5	29.4
	22:58:00	22:58:00		31.3	53.5	33.7	29.8	31.3	53	33.7	29.8
	22:59:00	22:59:00		31	51.6	33.3	29.8	31	50.9	33.3	29.7
	23:00:00	23:00:00		30.2	60.2	36	29.1	30.1	60.2	36	29
	23:01:00	23:01:00		29.7	56.1	31.4	28.6	29.6	56.1	31.3	28.6
	23:02:00	23:02:00		31.3	56.4	35.4	29.3	31.3	56.5	35.3	29.3
	23:03:00	23:03:00		31	57.8	35.1	29.4	31	57.9	35.1	29.3
	23:04:00	23:04:00		31.8	53.3	33.9	29.4	31.7	53.3	33.9	29.4
	23:05:00	23:05:00		33.3	62.2	40.7	30.8	33.3	62.3	40.7	30.7
	23:06:00	23:06:00		32.4	58.7	37.5	29.7	32.3	58.9	37.5	29.7
	23:07:00	23:07:00		35.1	66.7	44.6	29.5	35	66.7	44.6	29.4
	23:08:00	23:08:00		32.5	60.1	37.3	29.4	32.5	60.1	37.3	29.4
	23:09:00	23:09:00		32.3	54.9	34.5	30.4	32.2	55	34.5	30.4
	23:10:00	23:10:00		31.6	59.8	35.5	30.1	31.5	59.7	35.4	30.1
	23:11:00	23:11:00		31.9	56.7	34.1	30.1	31.9	56.7	34.1	30
	23:12:00	23:12:00		34.3	60.3	42.5	30.6	34.3	60.4	42.5	30.5
	23:13:00	23:13:00		33.8	59.4	41	30.8	33.7	59.7	40.9	30.8
	23:14:00	23:14:00		34.7	66.8	43.8	31	34.6	66.8	43.7	31
	23:15:00	23:15:00		34.5	59	38.6	31.4	34.5	58.8	38.5	31.3
	23:16:00	23:16:00		40.3	65.8	48	31.9	40.2	65.8	48	31.9
	23:17:00	23:17:00		48.6	75	58	31.7	48.6	74.9	58	31.7
	23:18:00	23:18:00		32.7	58.2	37	29.7	32.7	58.1	37	29.7
	23:19:00	23:19:00		30.8	53.4	34.4	29.3	30.8	53.4	34.4	29.2
	23:20:00	23:20:00		30.5	53	32.3	29.2	30.4	53	32.3	29.2
	23:21:00	23:21:00		30.3	51	33.6	29.2	30.3	51.3	33.5	29.2
	23:22:00	23:22:00		30.6	59.8	34.7	29.4	30.6	59.9	34.6	29.3
	23:23:00	23:23:00		33	57.9	36.2	30.4	33	57.6	36.2	30.3
	23:24:00	23:24:00		32.7	65.7	40.5	30.9	32.7	65.6	40.5	30.8
	23:25:00	23:25:00		33.7	56.6	38.6	30.1	33.7	56.2	38.6	30.1
	23:26:00	23:26:00		32.7	57.5	36.9	30	32.6	57.4	36.9	30
	23:27:00	23:27:00		30.3	55.8	33.2	29.2	30.3	55.3	33.2	29.2
	23:28:00	23:28:00		30.3	58.5	34.2	29.2	30.2	58.7	34.2	29.1
	23:29:00	23:29:00		30.4	56.7	37.7	28.9	30.3	56.4	37.7	28.8
	23:30:00	23:30:00		33.7	61.3	43.6	29.8	33.7	61.2	43.6	29.7
	23:31:00	23:31:00		32	59.8	36.9	29.9	32	60	36.9	29.9
	23:32:00	23:32:00		31.9	58.4	35.9	29.7	31.8	58.3	35.9	29.7
	23:33:00	23:33:00		32.4	57.2	37.9	30	32.4	57.3	37.9	30
	23:34:00	23:34:00		30.8	58.6	34.5	29.5	30.8	58.4	34.5	29.5
	23:35:00	23:35:00		33	57.1	38.6	30	33	56.7	38.6	30
	23:36:00	23:36:00		31.3	54.5	36.7	30.1	31.3	54.4	36.6	30.1
	23:37:00	23:37:00		34.9	65.5	40.7	30.3	34.8	65.5	40.7	30.3
	23:38:00	23:38:00		31.9	55.9	35.8	30.2	31.9	55.7	35.8	30.2
	23:39:00	23:39:00		32.7	58.6	40.6	30.1	32.6	58.4	40.5	30
	23:40:00	23:40:00		31.4	58.7	33.4	30.2	31.4	58.7	33.4	30.2
	23:41:00	23:41:00		31.5	51.1	33	30.3	31.5	50.7	33	30.3
	23:42:00	23:42:00		32	55.1	34	30.7	31.9	55.5	33.9	30.6
	23:43:00	23:43:00		32.3	58	36.4	29.9	32.3	58.2	36.3	29.8
	23:44:00	23:44:00		40.1	63.1	46.8	30.4	40	63.1	46.8	30.4
	23:45:00	23:45:00		37.4	61.2	44.1	32.1	37.4	61.3	44.1	32.1
	23:46:00	23:46:00		38.2	64.3	45.6	30.8	38.2	64.3	45.6	30.8

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #12	11:52 AM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8	34.6	2884.0	34.6	2884.0
Study #12	11:53 AM	10/22/2020	1819.7	32.6	1819.7	32.6	1819.7	29.8	955.0	29.8	955.0
Study #12	11:54 AM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1	30.4	1096.5	30.4	1096.5
Study #12	11:55 AM	10/22/2020	1445.4	31.6	1445.4	31.6	1445.4	30.0	1000.0	30.0	1000.0
	11:56 AM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0				
	11:57 AM	10/22/2020	1445.4	31.6	1445.4	31.6	1445.4				
	11:58 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9				
	11:59 AM	10/22/2020	3467.4	35.4	3467.4	35.4	3467.4				
	12:00 PM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0				
	12:01 PM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4				
	12:02 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8				
	12:03 PM	10/22/2020	2089.3	33.2	2089.3	33.2	2089.3				
	12:04 PM	10/22/2020	2951.2	34.7	2951.2	34.7	2951.2				
	12:05 PM	10/22/2020	2290.9	33.6	2290.9	33.6	2290.9				
	12:06 PM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8				
Study #13	12:07 PM	10/22/2020	2041.7	33.1	2041.7	33.1	2041.7	65.4	3467368.5	65.4	3467368.5
Study #13	12:08 PM	10/22/2020	2290.9	33.6	2290.9	33.6	2290.9	56.5	446683.6	56.5	446683.6
Study #13	12:09 PM	10/22/2020	3020.0	34.8	3020.0	34.8	3020.0	56.9	489778.8	56.9	489778.8
Study #13	12:10 PM	10/22/2020	6166.0	37.9	6166.0	37.9	6166.0	57.2	524807.5	57.2	524807.5
Study #13	12:11 PM	10/22/2020	7079.5	38.5	7079.5	38.5	7079.5	60.5	1122018.5	60.5	1122018.5
Study #13	12:12 PM	10/22/2020	1949.8	32.9	1949.8	32.9	1949.8	65.2	3311311.2	65.2	3311311.2
Study #13	12:13 PM	10/22/2020	23988.3	43.8	23988.3	43.8	23988.3	54.7	295120.9	54.7	295120.9
Study #13	12:14 PM	10/22/2020	21877.6	43.4	21877.6	43.4	21877.6	59.3	851138.0	59.3	851138.0
Study #13	12:15 PM	10/22/2020	3801.9	35.8	3801.9	35.8	3801.9	56.1	407380.3	56.1	407380.3
Study #13	12:16 PM	10/22/2020	3981.1	36.0	3981.1	36.0	3981.1	55.2	331131.1	55.2	331131.1
Study #13	12:17 PM	10/22/2020	6456.5	38.1	6456.5	38.1	6456.5	57.3	537031.8	57.3	537031.8
Study #13	12:18 PM	10/22/2020	2344.2	33.7	2344.2	33.7	2344.2	57.2	524807.5	57.2	524807.5
Study #13	12:19 PM	10/22/2020	2398.8	33.8	2398.8	33.8	2398.8	51.3	134896.3	51.3	134896.3
Study #13	12:20 PM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0	55.3	338844.2	55.3	338844.2
Study #13	12:21 PM	10/22/2020	3090.3	34.9	3090.3	34.9	3090.3	57.5	562341.3	57.5	562341.3
	12:22 PM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4				
	12:23 PM	10/22/2020	13182.6	41.2	13182.6	41.2	13182.6				
	12:24 PM	10/22/2020	2630.3	34.2	2630.3	34.2	2630.3				
	12:25 PM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0				
	12:26 PM	10/22/2020	1202.3	30.8	1202.3	30.8	1202.3				
	12:27 PM	10/22/2020	1349.0	31.3	1349.0	31.3	1349.0				
	12:28 PM	10/22/2020	1258.9	31.0	1258.9	31.0	1258.9				
	12:29 PM	10/22/2020	1047.1	30.2	1047.1	30.2	1047.1				
Study #14	12:30 PM	10/22/2020	933.3	29.7	933.3	29.7	933.3	42.9	19498.4	42.9	19498.4
Study #14	12:31 PM	10/22/2020	1349.0	31.3	1349.0	31.3	1349.0	30.3	1071.5	30.3	1071.5
Study #14	12:32 PM	10/22/2020	1258.9	31.0	1258.9	31.0	1258.9	32.1	1621.8	32.1	1621.8
Study #14	12:33 PM	10/22/2020	1513.6	31.8	1513.6	31.8	1513.6	33.0	1995.3	33.0	1995.3
Study #14	12:34 PM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0	31.3	1349.0	31.3	1349.0
Study #14	12:35 PM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8	30.5	1122.0	30.5	1122.0
Study #14	12:36 PM	10/22/2020	3235.9	35.1	3235.9	35.1	3235.9	29.7	933.3	29.7	933.3
Study #14	12:37 PM	10/22/2020	1778.3	32.5	1778.3	32.5	1778.3	31.5	1412.5	31.5	1412.5
Study #14	12:38 PM	10/22/2020	1698.2	32.3	1698.2	32.3	1698.2	32.1	1621.8	32.1	1621.8
Study #14	12:39 PM	10/22/2020	1445.4	31.6	1445.4	31.6	1445.4	31.4	1380.4	31.4	1380.4
Study #14	12:40 PM	10/22/2020	1548.8	31.9	1548.8	31.9	1548.8	30.6	1148.2	30.6	1148.2
Study #14	12:41 PM	10/22/2020	2691.5	34.3	2691.5	34.3	2691.5	35.3	3388.4	35.3	3388.4
Study #14	12:42 PM	10/22/2020	2398.8	33.8	2398.8	33.8	2398.8	32.1	1621.8	32.1	1621.8
Study #14	12:43 PM	10/22/2020	2951.2	34.7	2951.2	34.7	2951.2	35.9	3890.5	35.9	3890.5
Study #14	12:44 PM	10/22/2020	2818.4	34.5	2818.4	34.5	2818.4	33.7	2344.2	33.7	2344.2
	12:45 PM	10/22/2020	10715.2	40.3	10715.2	40.3	10715.2				
	12:46 PM	10/22/2020	72443.6	48.6	72443.6	48.6	72443.6				
	12:47 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1				
	12:48 PM	10/22/2020	1202.3	30.8	1202.3	30.8	1202.3				
	12:49 PM	10/22/2020	1122.0	30.5	1122.0	30.5	1122.0				
	12:50 PM	10/22/2020	1071.5	30.3	1071.5	30.3	1071.5				
	12:51 PM	10/22/2020	1148.2	30.6	1148.2	30.6	1148.2				
	12:52 PM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3				
	12:53 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1				
Study #15	12:54 PM	10/22/2020	2344.2	33.7	2344.2	33.7	2344.2	60.1	1023293.0	60.1	1023293.0
Study #15	12:55 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1	29.0	794.3	29.0	794.3
Study #15	12:56 PM	10/22/2020	1071.5	30.3	1071.5	30.3	1071.5	33.1	2041.7	33.1	2041.7
Study #15	12:57 PM	10/22/2020	1071.5	30.3	1071.5	30.3	1071.5	31.1	1288.2	31.1	1288.2
Study #15	12:58 PM	10/22/2020	1096.5	30.4	1096.5	30.4	1096.5	29.3	851.1	29.3	851.1
Study #15	12:59 PM	10/22/2020	2344.2	33.7	2344.2	33.7	2344.2	30.3	1071.5	30.3	1071.5
Study #15	1:00 PM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9	32.5	1778.3	32.5	1778.3
Study #15	1:01 PM	10/22/2020	1548.8	31.9	1548.8	31.9	1548.8	32.4	1737.8	32.4	1737.8
Study #15	1:02 PM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8	31.0	1258.9	31.0	1258.9
Study #15	1:03 PM	10/22/2020	1202.3	30.8	1202.3	30.8	1202.3	30.4	1096.5	30.4	1096.5
Study #15	1:04 PM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3	29.7	933.3	29.7	933.3
Study #15	1:05 PM	10/22/2020	1349.0	31.3	1349.0	31.3	1349.0	29.8	955.0	29.8	955.0
Study #15	1:06 PM	10/22/2020	3090.3	34.9	3090.3	34.9	3090.3	31.3	1349.0	31.3	1349.0
Study #15	1:07 PM	10/22/2020	1548.8	31.9	1548.8	31.9	1548.8	34.9	3090.3	34.9	3090.3
Study #15	1:08 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1	32.6	1819.7	32.6	1819.7
	1:09 PM	10/22/2020	1380.4	31.4	1380.4	31.4	1380.4				
	1:10 PM	10/22/2020	1412.5	31.5	1412.5	31.5	1412.5				
	1:11 PM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9				
	1:12 PM	10/22/2020	1698.2	32.3	1698.2	32.3	1698.2				
	1:13 PM	10/22/2020	10232.9	40.1	10232.9	40.1	10232.9				
	1:14 PM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4				
Study #16	1:15 PM	10/22/2020	6606.9	38.2	6606.9	38.2	6606.9	40.8	12022.6	40.8	12022.6

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	23:47:00	23:47:00		33.5	59.3	38.2	30.1	33.5	59.3	38.2	30.1
	23:48:00	23:48:00		32.3	62.5	39.3	30	32.3	62.6	39.3	29.9
	23:49:00	23:49:00		35.6	61.6	42.7	29.9	35.6	61.5	42.7	29.9
	23:50:00	23:50:00		31.9	56.1	37	29.8	31.9	55.8	36.9	29.7
	23:51:00	23:51:00		33.4	59.3	36.7	30.6	33.4	59.5	36.7	30.5
	23:52:00	23:52:00		35.3	63	40.3	32.2	35.2	63.2	40.2	32.1
	23:53:00	23:53:00		34.4	57.6	38.5	32.1	34.4	57.8	38.4	32
	23:54:00	23:54:00		34.5	60.7	37.9	32.2	34.5	60.7	37.9	32.2
	23:55:00	23:55:00		34.3	59.8	41.6	31.7	34.2	59.5	41.5	31.7
	23:56:00	23:56:00		33.8	61.6	36.6	31.5	33.7	61.7	36.6	31.4
	23:57:00	23:57:00		33.1	57	38.8	30.4	33.1	56.9	38.8	30.4
	23:58:00	23:58:00		32	59.4	35.8	29.9	32	59.4	35.7	29.9
	23:59:00	23:59:00		32.4	63.1	38.8	29.7	32.3	63.1	38.8	29.6
	24:00:00	24:00:00		31.6	66.9	37.7	29.4	31.6	66.9	37.6	29.3

			24-Hour Data					15-Minute Data			
	Time	Date	$L_{eq}\ 10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	$L_{dn}\ 10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #16	1:16 PM	10/22/2020	2238.7	33.5	2238.7	33.5	2238.7	33.4	2187.8	33.4	2187.8
Study #16	1:17 PM	10/22/2020	1698.2	32.3	1698.2	32.3	1698.2	39.8	9549.9	39.8	9549.9
Study #16	1:18 PM	10/22/2020	3630.8	35.6	3630.8	35.6	3630.8	39.5	8912.5	39.5	8912.5
Study #16	1:19 PM	10/22/2020	1548.8	31.9	1548.8	31.9	1548.8	37.1	5128.6	37.1	5128.6
Study #16	1:20 PM	10/22/2020	2187.8	33.4	2187.8	33.4	2187.8	33.6	2290.9	33.6	2290.9
Study #16	1:21 PM	10/22/2020	3388.4	35.3	3388.4	35.3	3388.4	34.7	2951.2	34.7	2951.2
Study #16	1:22 PM	10/22/2020	2754.2	34.4	2754.2	34.4	2754.2	39.5	8912.5	39.5	8912.5
Study #16	1:23 PM	10/22/2020	2818.4	34.5	2818.4	34.5	2818.4	38.3	6760.8	38.3	6760.8
Study #16	1:24 PM	10/22/2020	2691.5	34.3	2691.5	34.3	2691.5	52.3	169824.4	52.3	169824.4
Study #16	1:25 PM	10/22/2020	2398.8	33.8	2398.8	33.8	2398.8	35.3	3388.4	35.3	3388.4
Study #16	1:26 PM	10/22/2020	2041.7	33.1	2041.7	33.1	2041.7	36.4	4365.2	36.4	4365.2
Study #16	1:27 PM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9	40.4	10964.8	40.4	10964.8
Study #16	1:28 PM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8	40.5	11220.2	40.5	11220.2
Study #16	1:29 PM	10/22/2020	1445.4	31.6	1445.4	31.6	1445.4	48.6	72443.6	48.6	72443.6

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2			Time	Date	L_{eq} $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	L_{dn} $10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
Study #2	0:01:00	0:01:00		45.8	78	54.3	38.1	45.8	78	54.2	38.1	**15-Minute (Study #2)**		2:44 PM	10/21/2020	38018.9	45.8	38018.9	45.8	38018.9
Receptor 8 (R8)	0:02:00	0:02:00		45.3	68.8	50.7	37.4	45.2	68.8	50.7	37.4			2:45 PM	10/21/2020	33884.4	45.3	33884.4	45.3	33884.4
	0:03:00	0:03:00		39.6	64.4	43.9	36.4	39.6	64.2	43.8	36.4	L_{eq}	41.9	2:46 PM	10/21/2020	9120.1	39.6	9120.1	39.6	9120.1
	0:04:00	0:04:00		39.8	59.4	44.4	35.2	39.8	59.4	44.4	35.2			2:47 PM	10/21/2020	9549.9	39.8	9549.9	39.8	9549.9
	0:05:00	0:05:00		42.3	75.2	50.2	35.5	42.3	75.2	50.2	35.6	L_{dn}	41.9	2:48 PM	10/21/2020	16982.4	42.3	16982.4	42.3	16982.4
	0:06:00	0:06:00		39.4	64.3	44.8	35.6	39.4	64.3	44.8	35.6			2:49 PM	10/21/2020	8709.6	39.4	8709.6	39.4	8709.6
	0:07:00	0:07:00		38	62.9	44.7	33.8	38	62.8	44.7	33.9	CNEL	41.9	2:50 PM	10/21/2020	6309.6	38.0	6309.6	38.0	6309.6
	0:08:00	0:08:00		41.3	65	48.9	33.1	41.2	65.1	48.9	33.2			2:51 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6
	0:09:00	0:09:00		39.4	66.3	47.6	33.6	39.4	66.3	47.6	33.7			2:52 PM	10/21/2020	8709.6	39.4	8709.6	39.4	8709.6
	0:10:00	0:10:00		41.6	66.1	49	34.6	41.6	66	49	34.7			2:53 PM	10/21/2020	14454.4	41.6	14454.4	41.6	14454.4
	0:11:00	0:11:00		37.4	63.8	44.3	34.1	37.4	63.7	44.2	34.2			2:54 PM	10/21/2020	5495.4	37.4	5495.4	37.4	5495.4
	0:12:00	0:12:00		46.9	85.2	57.5	35.5	46.9	85.2	57.5	35.5			2:55 PM	10/21/2020	48977.9	46.9	48977.9	46.9	48977.9
	0:13:00	0:13:00		35.6	54.7	43	32.5	35.6	54.7	42.9	32.7			2:56 PM	10/21/2020	3630.8	35.6	3630.8	35.6	3630.8
	0:14:00	0:14:00		39.5	73	52.4	32.3	39.5	73	52.4	32.5			2:57 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5
	0:15:00	0:15:00		37.6	79.6	46.5	32.8	37.6	79.6	46.5	32.9			2:58 PM	10/21/2020	5754.4	37.6	5754.4	37.6	5754.4
Study #3	0:01:00	0:16:00		51.3	73.5	58.1	44.5	51.2	73.5	58	44.5	**15-Minute (Study #3)**		3:04 PM	10/21/2020	134896.3	51.3	134896.3	51.3	134896.3
Receptor 7 (R7)	0:02:00	0:17:00		49.1	68.8	53.6	41	49.1	68.7	53.5	41			3:05 PM	10/21/2020	81283.1	49.1	81283.1	49.1	81283.1
	0:03:00	0:18:00		44.1	63.8	47	40.4	44.1	63.7	47	40.4	L_{eq}	49.9	3:06 PM	10/21/2020	25704.0	44.1	25704.0	44.1	25704.0
	0:04:00	0:19:00		47	64.3	50.5	40.9	46.9	64.2	50.5	40.9			3:07 PM	10/21/2020	50118.7	47.0	50118.7	47.0	50118.7
	0:05:00	0:20:00		46.9	65.1	49.8	44.2	46.9	65	49.7	44.1	L_{dn}	49.9	3:08 PM	10/21/2020	48977.9	46.9	48977.9	46.9	48977.9
	0:06:00	0:21:00		49.4	68.7	55.2	42.7	49.4	68.6	55.2	42.6			3:09 PM	10/21/2020	87096.4	49.4	87096.4	49.4	87096.4
	0:07:00	0:22:00		48.7	68.2	55.6	43.2	48.7	68.3	55.5	43.2	CNEL	49.9	3:10 PM	10/21/2020	74131.0	48.7	74131.0	48.7	74131.0
	0:08:00	0:23:00		49.8	69	53.3	44.4	49.7	68.9	53.3	44.4			3:11 PM	10/21/2020	95499.3	49.8	95499.3	49.8	95499.3
	0:09:00	0:24:00		50.7	67.6	54.8	45.9	50.7	67.5	54.8	45.9			3:12 PM	10/21/2020	117489.8	50.7	117489.8	50.7	117489.8
	0:10:00	0:25:00		48.8	68.2	53.8	42.4	48.8	68.2	53.8	42.4			3:13 PM	10/21/2020	75857.8	48.8	75857.8	48.8	75857.8
	0:11:00	0:26:00		52.1	72.2	56.3	46.3	52.1	72.2	56.3	46.3			3:14 PM	10/21/2020	162181.0	52.1	162181.0	52.1	162181.0
	0:12:00	0:27:00		50.7	78.6	57.1	44.3	50.7	78.6	57.1	44.3			3:15 PM	10/21/2020	117489.8	50.7	117489.8	50.7	117489.8
	0:13:00	0:28:00		49.9	70.3	54.4	45.8	49.9	70.3	54.4	45.7			3:16 PM	10/21/2020	97723.7	49.9	97723.7	49.9	97723.7
	0:14:00	0:29:00		53.3	83.8	58	47.2	53.3	83.8	57.9	47.1			3:17 PM	10/21/2020	213796.2	53.3	213796.2	53.3	213796.2
	0:15:00	0:30:00		49.2	68.4	54.3	43.1	49.2	68.4	54.2	43.1			3:18 PM	10/21/2020	83176.4	49.2	83176.4	49.2	83176.4
Study #4	0:01:00	0:01:00		45.3	84.7	58.8	39.3	45.2	84.7	58.7	39.3	**15-Minute (Study #4)**		3:28 PM	10/21/2020	33884.4	45.3	33884.4	45.3	33884.4
Receptor 5 (R5) + 6 (R6)	0:02:00	0:02:00		40.6	61	45.5	37	40.6	60.9	45.4	37			3:29 PM	10/21/2020	11481.5	40.6	11481.5	40.6	11481.5
	0:03:00	0:03:00		38.4	59	45.3	33.6	38.4	59	45.3	33.7	L_{eq}	40.5	3:30 PM	10/21/2020	6918.3	38.4	6918.3	38.4	6918.3
	0:04:00	0:04:00		39.5	57.8	42.7	33.7	39.5	57.5	42.7	33.7			3:31 PM	10/21/2020	8912.5	39.5	8912.5	39.5	8912.5
	0:05:00	0:05:00		36.2	62.9	39.7	33.8	36.2	62.9	39.8	33.9	L_{dn}	40.5	3:32 PM	10/21/2020	4168.7	36.2	4168.7	36.2	4168.7
	0:06:00	0:06:00		37.1	52.8	39.7	35	37.2	52.6	39.7	35.1			3:33 PM	10/21/2020	5128.6	37.1	5128.6	37.1	5128.6
	0:07:00	0:07:00		37.6	61.2	43.6	35.2	37.6	61.4	43.6	35.3	CNEL	40.5	3:34 PM	10/21/2020	5754.4	37.6	5754.4	37.6	5754.4
	0:08:00	0:08:00		37.6	57.6	39.6	36.2	37.6	57.8	39.6	36.2			3:35 PM	10/21/2020	5754.4	37.6	5754.4	37.6	5754.4
	0:09:00	0:09:00		41.6	58.7	44.1	37.6	41.6	58.7	44	37.6			3:36 PM	10/21/2020	14454.4	41.6	14454.4	41.6	14454.4
	0:10:00	0:10:00		40.7	62.3	43.4	36.5	40.7	62.3	43.4	36.6			3:37 PM	10/21/2020	11749.0	40.7	11749.0	40.7	11749.0
	0:11:00	0:11:00		38.4	57.3	40.2	36.3	38.4	56.9	40.2	36.4			3:38 PM	10/21/2020	6918.3	38.4	6918.3	38.4	6918.3
	0:12:00	0:12:00		38.2	56.2	40.8	35.4	38.3	56.1	40.8	35.4			3:39 PM	10/21/2020	6606.9	38.2	6606.9	38.2	6606.9
	0:13:00	0:13:00		41.1	57.7	43.8	38.8	41.1	57.9	43.8	38.8			3:40 PM	10/21/2020	12882.5	41.1	12882.5	41.1	12882.5
	0:14:00	0:14:00		41.5	61.6	44.3	38.9	41.5	61.8	44.2	38.9			3:41 PM	10/21/2020	14125.4	41.5	14125.4	41.5	14125.4
	0:15:00	0:15:00		43.3	78.8	50.3	39.4	43.3	78.7	50.3	39.5			3:42 PM	10/21/2020	21379.6	43.3	21379.6	43.3	21379.6
Study #5	0:01:00	0:01:00		39.4	70.8	49.3	35.4	39.4	70.8	49.2	35.5	**15-Minute (Study #5)**		4:43 PM	10/21/2020	8709.6	39.4	8709.6	39.4	8709.6
Receptor 4 (R4)	0:02:00	0:02:00		37.2	52.8	40	33.6	37.3	53	40.1	33.7			4:44 PM	10/21/2020	5248.1	37.2	5248.1	37.2	5248.1
	0:03:00	0:03:00		36.7	57.3	41	34.1	36.8	57.4	41.1	34.2	L_{eq}	39.5	4:45 PM	10/21/2020	4677.4	36.7	4677.4	36.7	4677.4
	0:04:00	0:04:00		37.7	63.8	41.4	34.2	37.8	63.8	41.3	34.3			4:46 PM	10/21/2020	5888.4	37.7	5888.4	37.7	5888.4
	0:05:00	0:05:00		39.1	70.9	43.1	35.6	39.1	70.9	43.1	35.6	L_{dn}	39.5	4:47 PM	10/21/2020	8128.3	39.1	8128.3	39.1	8128.3
	0:06:00	0:06:00		37.5	58.1	41.2	34.9	37.6	58.1	41.2	35			4:48 PM	10/21/2020	5623.4	37.5	5623.4	37.5	5623.4
	0:07:00	0:07:00		38.5	59.1	42.2	35.6	38.5	58.9	42.2	35.6	CNEL	39.5	4:49 PM	10/21/2020	7079.5	38.5	7079.5	38.5	7079.5
	0:08:00	0:08:00		38.9	54.8	40.9	35.7	38.9	54.8	40.9	35.8			4:50 PM	10/21/2020	7762.5	38.9	7762.5	38.9	7762.5
	0:09:00	0:09:00		41	59.2	43.7	37.6	41	59.1	43.6	37.5			4:51 PM	10/21/2020	12589.3	41.0	12589.3	41.0	12589.3
	0:10:00	0:10:00		38.2	59.9	41.3	34.8	38.2	59.7	41.3	34.9			4:52 PM	10/21/2020	6606.9	38.2	6606.9	38.2	6606.9
	0:11:00	0:11:00		39.9	57.7	44.5	36.1	39.9	57.6	44.5	36.2			4:53 PM	10/21/2020	9772.4	39.9	9772.4	39.9	9772.4
	0:12:00	0:12:00		38.9	69.1	42.6	35.2	38.9	69.1	42.6	35.3			4:54 PM	10/21/2020	7762.5	38.9	7762.5	38.9	7762.5
	0:13:00	0:13:00		41.3	59.9	46.2	36.4	41.3	60.1	46.2	36.5			4:55 PM	10/21/2020	13489.6	41.3	13489.6	41.3	13489.6
	0:14:00	0:14:00		40.8	58.2	43.8	36.1	40.9	58.1	43.7	36.2			4:56 PM	10/21/2020	12022.6	40.8	12022.6	40.8	12022.6
	0:15:00	0:15:00		42.4	71.9	47	39	42.4	71.8	47	39			4:57 PM	10/21/2020	17378.0	42.4	17378.0	42.4	17378.0
Study #6	0:01:00	0:16:00		54.4	76.5	64.3	43.6	54.3	76.4	64.3	43.5	**15-Minute (Study #6)**		5:09 PM	10/21/2020	275422.9	54.4	275422.9	54.4	275422.9
Receptor 3 (R3)	0:02:00	0:17:00		51.4	69.7	57.1	41.2	51.4	69.6	57.1	41.2			5:10 PM	10/21/2020	138038.4	51.4	138038.4	51.4	138038.4
	0:03:00	0:18:00		47.9	69.4	55.4	36.2	47.9	69.5	55.4	36.3	L_{eq}	51.1	5:11 PM	10/21/2020	61659.5	47.9	61659.5	47.9	61659.5

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	0:04:00	0:19:00		53.5	73.4	58.9	36.7	53.5	73.3	58.9	36.7
	0:05:00	0:20:00		49.7	68.4	55	38.4	49.7	68.3	55	38.4
	0:06:00	0:21:00		43.3	64.6	52.2	36.1	43.3	64.5	52.2	36.2
	0:07:00	0:22:00		50.4	70.5	57	37.5	50.4	70.4	56.9	37.6
	0:08:00	0:23:00		46.8	68.8	56.5	35.6	46.8	68.9	56.5	35.7
	0:09:00	0:24:00		52.9	71.9	58.7	37.3	52.9	71.8	58.6	37.4
	0:10:00	0:25:00		48.3	67.7	54.9	36.5	48.2	67.7	54.8	36.6
	0:11:00	0:26:00		48.4	70.8	58.5	35.7	48.3	70.7	58.4	35.7
	0:12:00	0:27:00		49.4	68.3	55	38.1	49.4	68.4	54.9	38.2
	0:13:00	0:28:00		50.7	72.8	61.4	35.7	50.6	72.7	61.3	35.8
	0:14:00	0:29:00		55.2	78.7	66	39.4	55.2	78.6	65.9	39.4
	0:15:00	0:30:00		49.6	78.5	54.5	40.2	49.6	78.5	54.5	40.2
Study #7	0:01:00	0:31:00		43.5	72.7	60.4	30.3	43.5	72.6	60.4	30.5
Receptor 2 (R2)	0:02:00	0:32:00		30.1	51	33.2	29.1	30.3	50.7	33.1	29.4
	0:03:00	0:33:00		29.3	50.5	29.9	28.8	29.6	50.9	30.3	29.2
	0:04:00	0:34:00		29.4	51.6	31.8	28.8	29.8	52.2	32.1	29.2
	0:05:00	0:35:00		30.2	57	36.2	28.7	30.5	56.8	36.2	29.1
	0:06:00	0:36:00		29	51.3	33	28.3	29.4	51.8	33	28.8
	0:07:00	0:37:00		29.1	52.3	32	28.1	29.5	52.6	32	28.7
	0:08:00	0:38:00		28.9	48.5	30	28.2	29.3	48.9	30.3	28.7
	0:09:00	0:39:00		29.3	49.6	30.9	28.2	29.6	48.7	31.1	28.7
	0:10:00	0:40:00		30.3	66.1	35.9	29.1	30.5	66	35.9	29.4
	0:11:00	0:41:00		32.7	62.6	41.7	29.3	32.8	62.4	41.7	29.6
	0:12:00	0:42:00		31.1	59.2	42.1	28.1	31.4	59.2	42.1	28.5
	0:13:00	0:43:00		30.3	48.7	32.8	28.9	30.5	49.3	32.9	29.3
	0:14:00	0:44:00		37.7	81.9	53.5	29.1	37.7	81.8	53.5	29.4
	0:15:00	0:45:00		35.5	75.9	50.1	28.4	35.6	75.9	50.1	28.8
Study #8	0:01:00	0:46:00		38	81.7	49.4	31.8	38.1	81.6	49.4	32
Receptor 9 (R9)	0:02:00	0:47:00		33.1	53.4	35.1	31.9	33.2	53.5	35.2	32
	0:03:00	0:48:00		33.2	51.2	34.2	31.9	33.3	51.3	34.4	32.1
	0:04:00	0:49:00		33.5	50.5	34.9	32.3	33.6	50.3	35.1	32.4
	0:05:00	0:50:00		33.4	50.1	35.8	32	33.6	50.4	35.9	32.1
	0:06:00	0:51:00		34	57.5	36	32.2	34.1	57.9	36	32.3
	0:07:00	0:52:00		33.8	52.5	35.2	32	33.9	52.4	35.3	32.1
	0:08:00	0:53:00		33.5	51.7	35.1	32.1	33.6	51.4	35.2	32.2
	0:09:00	0:54:00		33.1	55.3	34.5	31.7	33.3	55.7	34.6	31.9
	0:10:00	0:55:00		33.8	50.9	35.4	32.5	33.9	51.5	35.5	32.6
	0:11:00	0:56:00		33.4	52.6	35	32.1	33.6	52.9	35.2	32.3
	0:12:00	0:57:00		33.2	49.4	35	32.1	33.4	49.5	35.1	32.3
	0:13:00	0:58:00		33.5	56.9	35.2	32.2	33.6	57.2	35.3	32.4
	0:14:00	0:59:00		39	76.4	48.8	32.5	39	76.4	48.7	32.6
	0:15:00	1:00:00		40.4	83.3	53.9	33.4	40.4	83.2	53.8	33.5
Study #9	0:01:00	0:01:00		40.5	76.6	48.7	30.6	40.5	76.5	48.7	30.8
Receptor 10 (R10)	0:02:00	0:02:00		32.1	52.3	36	30.3	32.3	52.7	36.1	30.5
	0:03:00	0:03:00		32.7	60.5	38.8	30.3	32.8	60.6	38.8	30.5
	0:04:00	0:04:00		33.3	53	37.2	30.4	33.4	53.2	37.1	30.6
	0:05:00	0:05:00		32.5	54.1	35.2	30.8	32.7	54.4	35.2	31
	0:06:00	0:06:00		32.9	57.9	37.6	30.9	33	58	37.5	31.1
	0:07:00	0:07:00		55.6	85.5	69.7	31.6	55.5	85.5	69.7	31.8
	0:08:00	0:08:00		58.4	88.4	72.5	32.3	58.3	88.4	72.4	32.4
	0:09:00	0:09:00		34.4	59.8	39.5	30.7	34.5	59.8	39.5	30.9
	0:10:00	0:10:00		35.6	55	42.1	30.6	35.6	55	42	30.8
	0:11:00	0:11:00		31.7	62.2	35.3	29.8	31.9	62.4	35.4	30.1
	0:12:00	0:12:00		32.8	56.9	38.1	30	32.9	57	38.1	30.3
	0:13:00	0:13:00		32	52.5	36.3	30.4	32.2	52.3	36.2	30.6
	0:14:00	0:14:00		37.4	80.4	49	30.6	37.4	80.4	49	30.9
	0:15:00	0:15:00		31.1	57.9	36.3	29.9	31.4	57.7	36.3	30.3
Study #10	0:01:00	0:16:00		40.9	75.1	49.4	37.9	40.9	75.1	49.4	37.9
Receptor 2 (R2)	0:02:00	0:17:00		39.9	61	44.6	36.1	39.8	61.3	44.6	36.1
	0:03:00	0:18:00		38.6	62.6	42.3	35.9	38.6	62.6	42.3	35.9
	0:04:00	0:19:00		41.3	62.4	45.5	37.9	41.3	62.3	45.5	37.9
	0:05:00	0:20:00		39.5	63.6	43.4	36.9	39.5	63.7	43.3	36.9
	0:06:00	0:21:00		37.4	56.2	40.1	36	37.4	56.4	40.1	36
	0:07:00	0:22:00		39.8	66.4	44.6	36	39.8	66.4	44.6	36.1

L_{dn}	51.1
CNEL	51.1
L_{eq}	48.8

15-Minute (Study #7)

L_{eq}	34.7
L_{dn}	34.7
CNEL	34.7

15-Minute (Study #8)

L_{eq}	35.4
L_{dn}	35.4
CNEL	35.4

15-Minute (Study #9)

L_{eq}	48.6
L_{dn}	48.6
CNEL	48.6

15-Minute (Study #10)

L_{eq}	47.3
L_{dn}	47.3
CNEL	47.3

Time	Date	L_{eq} $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	L_{dn} $10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
5:12 PM	10/21/2020	223872.1	53.5	223872.1	53.5	223872.1
5:13 PM	10/21/2020	93325.4	49.7	93325.4	49.7	93325.4
5:14 PM	10/21/2020	21379.6	43.3	21379.6	43.3	21379.6
5:15 PM	10/21/2020	109647.8	50.4	109647.8	50.4	109647.8
5:16 PM	10/21/2020	47863.0	46.8	47863.0	46.8	47863.0
5:17 PM	10/21/2020	194984.5	52.9	194984.5	52.9	194984.5
5:18 PM	10/21/2020	67608.3	48.3	67608.3	48.3	67608.3
5:19 PM	10/21/2020	69183.1	48.4	69183.1	48.4	69183.1
5:20 PM	10/21/2020	87096.4	49.4	87096.4	49.4	87096.4
5:21 PM	10/21/2020	117489.8	50.7	117489.8	50.7	117489.8
5:22 PM	10/21/2020	331131.1	55.2	331131.1	55.2	331131.1
5:23 PM	10/21/2020	91201.1	49.6	91201.1	49.6	91201.1
5:30 PM	10/21/2020	22387.2	43.5	22387.2	43.5	22387.2
5:31 PM	10/21/2020	1023.3	30.1	1023.3	30.1	1023.3
5:32 PM	10/21/2020	851.1	29.3	851.1	29.3	851.1
5:33 PM	10/21/2020	871.0	29.4	871.0	29.4	871.0
5:34 PM	10/21/2020	1047.1	30.2	1047.1	30.2	1047.1
5:35 PM	10/21/2020	794.3	29.0	794.3	29.0	794.3
5:36 PM	10/21/2020	812.8	29.1	812.8	29.1	812.8
5:37 PM	10/21/2020	776.2	28.9	776.2	28.9	776.2
5:38 PM	10/21/2020	851.1	29.3	851.1	29.3	851.1
5:39 PM	10/21/2020	1071.5	30.3	1071.5	30.3	1071.5
5:40 PM	10/21/2020	1862.1	32.7	1862.1	32.7	1862.1
5:41 PM	10/21/2020	1288.2	31.1	1288.2	31.1	1288.2
5:42 PM	10/21/2020	1071.5	30.3	1071.5	30.3	1071.5
5:43 PM	10/21/2020	5888.4	37.7	5888.4	37.7	5888.4
5:44 PM	10/21/2020	3548.1	35.5	3548.1	35.5	3548.1
5:51 PM	10/21/2020	6309.6	38.0	6309.6	38.0	6309.6
5:52 PM	10/21/2020	2041.7	33.1	2041.7	33.1	2041.7
5:53 PM	10/21/2020	2089.3	33.2	2089.3	33.2	2089.3
5:54 PM	10/21/2020	2238.7	33.5	2238.7	33.5	2238.7
5:55 PM	10/21/2020	2187.8	33.4	2187.8	33.4	2187.8
5:56 PM	10/21/2020	2511.9	34.0	2511.9	34.0	2511.9
5:57 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8
5:58 PM	10/21/2020	2238.7	33.5	2238.7	33.5	2238.7
5:59 PM	10/21/2020	2041.7	33.1	2041.7	33.1	2041.7
6:00 PM	10/21/2020	2398.8	33.8	2398.8	33.8	2398.8
6:01 PM	10/21/2020	2187.8	33.4	2187.8	33.4	2187.8
6:02 PM	10/21/2020	2089.3	33.2	2089.3	33.2	2089.3
6:03 PM	10/21/2020	2238.7	33.5	2238.7	33.5	2238.7
6:04 PM	10/21/2020	7943.3	39.0	7943.3	39.0	7943.3
6:05 PM	10/21/2020	10964.8	40.4	10964.8	40.4	10964.8
10:26 AM	10/22/2020	11220.2	40.5	11220.2	40.5	11220.2
10:27 AM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
10:28 AM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1
10:29 AM	10/22/2020	2138.0	33.3	2138.0	33.3	2138.0
10:30 AM	10/22/2020	1778.3	32.5	1778.3	32.5	1778.3
10:31 AM	10/22/2020	1949.8	32.9	1949.8	32.9	1949.8
10:32 AM	10/22/2020	363078.1	55.6	363078.1	55.6	363078.1
10:33 AM	10/22/2020	691831.0	58.4	691831.0	58.4	691831.0
10:34 AM	10/22/2020	2754.2	34.4	2754.2	34.4	2754.2
10:35 AM	10/22/2020	3630.8	35.6	3630.8	35.6	3630.8
10:36 AM	10/22/2020	1479.1	31.7	1479.1	31.7	1479.1
10:37 AM	10/22/2020	1905.5	32.8	1905.5	32.8	1905.5
10:38 AM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9
10:39 AM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4
10:40 AM	10/22/2020	1288.2	31.1	1288.2	31.1	1288.2
10:53 AM	10/22/2020	12302.7	40.9	12302.7	40.9	12302.7
10:54 AM	10/22/2020	9772.4	39.9	9772.4	39.9	9772.4
10:55 AM	10/22/2020	7244.4	38.6	7244.4	38.6	7244.4
10:56 AM	10/22/2020	13489.6	41.3	13489.6	41.3	13489.6
10:57 AM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5
10:58 AM	10/22/2020	5495.4	37.4	5495.4	37.4	5495.4
10:59 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	0:08:00	0:23:00		44.2	67.6	51.1	36.7	44.2	67.5	51.1	36.7
	0:09:00	0:24:00		39.4	62.8	45.2	35.3	39.4	62.6	45.1	35.4
	0:10:00	0:25:00		40.5	60.9	45.9	35.9	40.5	61	45.9	35.9
	0:11:00	0:26:00		38.3	56.1	42.8	35.2	38.3	56.2	42.8	35.3
	0:12:00	0:27:00		58.2	88.6	71.3	37.9	58.2	88.5	71.3	37.8
	0:13:00	0:28:00		40.7	60.1	44.9	37.1	40.7	60.2	44.9	37.2
	0:14:00	0:29:00		41.8	76.8	52.7	36.8	41.8	76.8	52.7	36.8
	0:15:00	0:30:00		38.3	61.4	40.3	36.4	38.3	61.5	40.3	36.4
Study #11	0:01:00	0:31:00		41.7	74.8	52.4	36	41.7	74.7	52.3	36.1
Receptor 3 (R3)	0:02:00	0:32:00		38	60.1	40.6	36.2	38	59.9	40.6	36.2
	0:03:00	0:33:00		37.9	65.5	39.8	36.3	37.9	65.6	39.7	36.2
	0:04:00	0:34:00		39.8	59.2	44.2	36.1	39.8	59	44.1	36
	0:05:00	0:35:00		40	64.8	44.1	35.9	39.9	64.7	44.1	35.9
	0:06:00	0:36:00		42.7	58.1	45.6	39.3	42.7	58.4	45.6	39.2
	0:07:00	0:37:00		43.2	66.5	46.3	40.8	43.1	66.5	46.3	40.8
	0:08:00	0:38:00		42.6	61.7	46	40.9	42.6	61.7	46	40.8
	0:09:00	0:39:00		43.3	57.5	45.4	41.1	43.3	57.5	45.4	41.1
	0:10:00	0:40:00		43.2	61.6	45.6	39.9	43.1	61.7	45.6	39.9
	0:11:00	0:41:00		41.6	56.3	44.6	39.1	41.6	56.3	44.5	39
	0:12:00	0:42:00		60.1	90	74.7	36.3	60.1	89.9	74.7	36.3
	0:13:00	0:43:00		46.3	63.9	63.2	34.7	46.3	64	63.2	34.7
	0:14:00	0:44:00		36.7	75.1	49.6	31.9	36.7	75.1	49.6	32
	0:15:00	0:45:00		35.5	81.4	45.7	31.7	35.5	81.4	45.7	31.8
Study #12	0:01:00	0:46:00		39.5	73.3	49.3	29.7	39.5	73.3	49.2	29.9
Receptor 4 (R4)	0:02:00	0:47:00		38.7	59.3	45.8	29.1	38.7	59.4	45.7	29.5
	0:03:00	0:48:00		41.9	60.8	47.8	28.9	41.9	60.8	47.8	29.3
	0:04:00	0:49:00		29.5	51.4	32.4	28.8	29.8	51.5	32.6	29.2
	0:05:00	0:50:00		28.8	47.9	29.3	28.4	29.2	47.1	29.6	28.8
	0:06:00	0:51:00		29.1	43.5	30.8	28.6	29.5	44.6	30.9	29
	0:07:00	0:52:00		29.2	45.2	30	28.7	29.5	45.3	30.2	29.1
	0:08:00	0:53:00		29.3	44.2	30.2	28.7	29.6	44.5	30.5	29.2
	0:09:00	0:54:00		31.8	51.1	35.9	28.7	31.9	51	36	29.1
	0:10:00	0:55:00		33.6	81.2	49.2	28.5	33.7	81.2	49.2	29
	0:11:00	0:56:00		32.7	71.3	46.4	28.8	32.9	71.3	46.4	29.3
	0:12:00	0:57:00		34.6	77.5	49.5	28.7	34.7	77.5	49.4	29.2
	0:13:00	0:58:00		29.8	48.3	33.8	28.5	30.1	48.2	33.9	28.9
	0:14:00	0:59:00		30.4	57.9	33.2	29.2	30.6	57.9	33.3	29.6
	0:15:00	1:00:00		30	61.1	31.1	29.4	30.3	61.1	31.3	29.7
Study #13	0:01:00	1:01:00		65.4	90.5	76	38.3	65.3	90.5	76	38.3
Receptor 5 (R5) + 6 (R6)	0:02:00	1:02:00		56.5	77.6	65.4	34.3	56.5	77.5	65.4	34.3
	0:03:00	1:03:00		56.9	78.6	64.9	37	56.9	78.5	64.8	37
	0:04:00	1:04:00		57.2	80.7	68	35.8	57.2	80.7	68	35.8
	0:05:00	1:05:00		60.5	80.1	66.5	40.3	60.5	80.1	66.4	40.2
	0:06:00	1:06:00		65.2	87.5	75.4	42.2	65.2	87.5	75.3	42.1
	0:07:00	1:07:00		54.7	76.6	63.3	36.7	54.7	76.6	63.3	36.7
	0:08:00	1:08:00		59.3	82	68.5	33.9	59.3	82	68.5	34
	0:09:00	1:09:00		56.1	76.6	63.2	31.9	56	76.5	63.2	32.1
	0:10:00	1:10:00		55.2	77.4	63.3	31.8	55.2	77.4	63.2	32
	0:11:00	1:11:00		57.3	77.3	64.8	33.4	57.2	77.3	64.7	33.6
	0:12:00	1:12:00		57.2	80.3	66.6	38.1	57.2	80.2	66.5	38.1
	0:13:00	1:13:00		51.3	73	63.1	33.7	51.3	72.9	63.1	33.8
	0:14:00	1:14:00		55.3	76	63.6	34.7	55.3	76	63.5	34.8
	0:15:00	1:15:00		57.5	79.8	65.9	35.8	57.5	79.8	65.8	35.9
Study #14	0:01:00	1:16:00		42.9	73.3	59.8	28.8	42.8	73.2	59.7	29.3
Receptor 7 (R7)	0:02:00	1:17:00		30.3	48.7	36.4	28.9	30.6	48.6	36.4	29.3
	0:03:00	1:18:00		32.1	72.9	44.2	28.8	32.3	72.9	44.2	29.2
	0:04:00	1:19:00		33	50	38.7	29.6	33.1	50	38.6	29.9
	0:05:00	1:20:00		31.3	50.4	37.4	29.6	31.5	50.3	37.3	29.8
	0:06:00	1:21:00		30.5	54.5	33.5	29.3	30.7	54.6	33.6	29.7
	0:07:00	1:22:00		29.7	47.3	30.8	29.2	30	47.8	31.1	29.6
	0:08:00	1:23:00		31.5	46.9	33.7	29.6	31.7	46.6	33.7	29.9
	0:09:00	1:24:00		32.1	63	40.6	29.5	32.3	63.1	40.6	29.9
	0:10:00	1:25:00		31.4	62.3	39.5	29.2	31.6	62.3	39.5	29.6
	0:11:00	1:26:00		30.6	51	33.4	29.2	30.9	50.7	33.5	29.5

15-Minute (Study #11)

L_{eq} 49.2

L_{dn} 49.2

CNEL 49.2

15-Minute (Study #12)

L_{eq} 35.0

L_{dn} 35.0

CNEL 35.0

15-Minute (Study #13)

L_{eq} 59.5

L_{dn} 59.5

CNEL 59.5

15-Minute (Study #14)

L_{eq} 34.7

L_{dn} 34.7

CNEL 34.7

Time	Date	L_{eq} $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	L_{dn} $10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
11:00 AM	10/22/2020	26302.7	44.2	26302.7	44.2	26302.7
11:01 AM	10/22/2020	8709.6	39.4	8709.6	39.4	8709.6
11:02 AM	10/22/2020	11220.2	40.5	11220.2	40.5	11220.2
11:03 AM	10/22/2020	6760.8	38.3	6760.8	38.3	6760.8
11:04 AM	10/22/2020	660693.4	58.2	660693.4	58.2	660693.4
11:05 AM	10/22/2020	11749.0	40.7	11749.0	40.7	11749.0
11:06 AM	10/22/2020	15135.6	41.8	15135.6	41.8	15135.6
11:07 AM	10/22/2020	6760.8	38.3	6760.8	38.3	6760.8
11:19 AM	10/22/2020	14791.1	41.7	14791.1	41.7	14791.1
11:20 AM	10/22/2020	6309.6	38.0	6309.6	38.0	6309.6
11:21 AM	10/22/2020	6166.0	37.9	6166.0	37.9	6166.0
11:22 AM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9
11:23 AM	10/22/2020	10000.0	40.0	10000.0	40.0	10000.0
11:24 AM	10/22/2020	18620.9	42.7	18620.9	42.7	18620.9
11:25 AM	10/22/2020	20893.0	43.2	20893.0	43.2	20893.0
11:26 AM	10/22/2020	18197.0	42.6	18197.0	42.6	18197.0
11:27 AM	10/22/2020	21379.6	43.3	21379.6	43.3	21379.6
11:28 AM	10/22/2020	20893.0	43.2	20893.0	43.2	20893.0
11:29 AM	10/22/2020	14454.4	41.6	14454.4	41.6	14454.4
11:30 AM	10/22/2020	1023293.0	60.1	1023293.0	60.1	1023293.0
11:31 AM	10/22/2020	42658.0	46.3	42658.0	46.3	42658.0
11:32 AM	10/22/2020	4677.4	36.7	4677.4	36.7	4677.4
11:33 AM	10/22/2020	3548.1	35.5	3548.1	35.5	3548.1
11:41 AM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5
11:42 AM	10/22/2020	7413.1	38.7	7413.1	38.7	7413.1
11:43 AM	10/22/2020	15488.2	41.9	15488.2	41.9	15488.2
11:44 AM	10/22/2020	891.3	29.5	891.3	29.5	891.3
11:45 AM	10/22/2020	758.6	28.8	758.6	28.8	758.6
11:46 AM	10/22/2020	812.8	29.1	812.8	29.1	812.8
11:47 AM	10/22/2020	831.8	29.2	831.8	29.2	831.8
11:48 AM	10/22/2020	851.1	29.3	851.1	29.3	851.1
11:49 AM	10/22/2020	1513.6	31.8	1513.6	31.8	1513.6
11:50 AM	10/22/2020	2290.9	33.6	2290.9	33.6	2290.9
11:51 AM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1
11:52 AM	10/22/2020	2884.0	34.6	2884.0	34.6	2884.0
11:53 AM	10/22/2020	955.0	29.8	955.0	29.8	955.0
11:54 AM	10/22/2020	1096.5	30.4	1096.5	30.4	1096.5
11:55 AM	10/22/2020	1000.0	30.0	1000.0	30.0	1000.0
12:07 PM	10/22/2020	3467368.5	65.4	3467368.5	65.4	3467368.5
12:08 PM	10/22/2020	446683.6	56.5	446683.6	56.5	446683.6
12:09 PM	10/22/2020	489778.8	56.9	489778.8	56.9	489778.8
12:10 PM	10/22/2020	524807.5	57.2	524807.5	57.2	524807.5
12:11 PM	10/22/2020	1122018.5	60.5	1122018.5	60.5	1122018.5
12:12 PM	10/22/2020	3311311.2	65.2	3311311.2	65.2	3311311.2
12:13 PM	10/22/2020	295120.9	54.7	295120.9	54.7	295120.9
12:14 PM	10/22/2020	851138.0	59.3	851138.0	59.3	851138.0
12:15 PM	10/22/2020	407380.3	56.1	407380.3	56.1	407380.3
12:16 PM	10/22/2020	331131.1	55.2	331131.1	55.2	331131.1
12:17 PM	10/22/2020	537031.8	57.3	537031.8	57.3	537031.8
12:18 PM	10/22/2020	524807.5	57.2	524807.5	57.2	524807.5
12:19 PM	10/22/2020	134896.3	51.3	134896.3	51.3	134896.3
12:20 PM	10/22/2020	338844.2	55.3	338844.2	55.3	338844.2
12:21 PM	10/22/2020	562341.3	57.5	562341.3	57.5	562341.3
12:30 PM	10/22/2020	19498.4	42.9	19498.4	42.9	19498.4
12:31 PM	10/22/2020	1071.5	30.3	1071.5	30.3	1071.5
12:32 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
12:33 PM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3
12:34 PM	10/22/2020	1349.0	31.3	1349.0	31.3	1349.0
12:35 PM	10/22/2020	1122.0	30.5	1122.0	30.5	1122.0
12:36 PM	10/22/2020	933.3	29.7	933.3	29.7	933.3
12:37 PM	10/22/2020	1412.5	31.5	1412.5	31.5	1412.5
12:38 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
12:39 PM	10/22/2020	1380.4	31.4	1380.4	31.4	1380.4
12:40 PM	10/22/2020	1148.2	30.6	1148.2	30.6	1148.2

Study	Study Time	Session Time	OL Status	L_{avg} Meter 1	L_{pk} Meter 1	L_{max} Meter 1	L_{min} Meter 1	L_{avg} Meter 2	L_{pk} Meter 2	L_{max} Meter 2	L_{min} Meter 2
	0:12:00	1:27:00		35.3	52.2	42.5	29.3	35.3	52.4	42.3	29.7
	0:13:00	1:28:00		32.1	61.4	37.1	29.6	32.2	61.2	37.1	29.9
	0:14:00	1:29:00		35.9	81.7	48.3	28.9	36	81.7	48.3	29.3
	0:15:00	1:30:00		33.7	56.9	41	29.3	33.7	56.8	40.9	29.6
Study #15	0:01:00	1:31:00		60.1	114	77.1	28.2	60.1	113.9	77.1	28.7
Receptor 8 (R8)	0:02:00	1:32:00		29	46.5	30.2	28.1	29.4	46.3	30.6	28.6
	0:03:00	1:33:00		33.1	64.1	45.3	28	33.2	64.1	45.2	28.6
	0:04:00	1:34:00		31.1	65.4	44.7	27.9	31.3	65.4	44.7	28.5
	0:05:00	1:35:00		29.3	52.9	33.7	28	29.7	52.9	33.9	28.6
	0:06:00	1:36:00		30.3	50.9	35.3	28.5	30.6	50.2	35.2	29
	0:07:00	1:37:00		32.5	50.8	38	29.8	32.6	50.6	37.9	30.2
	0:08:00	1:38:00		32.4	57.6	37.7	29.2	32.5	57.6	37.7	29.6
	0:09:00	1:39:00		31	56.2	35.1	28.2	31.2	56.3	35.2	28.7
	0:10:00	1:40:00		30.4	56.1	34.2	28	30.7	56.4	34.3	28.6
	0:11:00	1:41:00		29.7	50.9	33	28	30	50.8	33.1	28.5
	0:12:00	1:42:00		29.8	54.8	35.5	28.3	30.1	54.7	35.5	28.8
	0:13:00	1:43:00		31.3	60.3	41.2	28.3	31.6	60.4	41.2	28.8
	0:14:00	1:44:00		34.9	74.2	47.6	28.1	35	74.2	47.6	28.7
	0:15:00	1:45:00		32.6	65	42	28.3	32.7	65	42	28.8
Study #16	0:01:00	1:46:00		40.8	70	51	31	40.8	70	51	31.3
Receptor 9 (R9)	0:02:00	1:47:00		33.4	57.5	37.1	31.2	33.5	57.8	37.1	31.4
	0:03:00	1:48:00		39.8	61.9	48.4	31.5	39.8	61.8	48.3	31.7
	0:04:00	1:49:00		39.5	86	53.4	32.2	39.5	85.9	53.3	32.3
	0:05:00	1:50:00		37.1	58.8	43.9	31	37	58.8	43.8	31.2
	0:06:00	1:51:00		33.6	53.2	38.1	30.6	33.7	53.2	38	30.9
	0:07:00	1:52:00		34.7	61	42.1	30.1	34.7	61	42	30.4
	0:08:00	1:53:00		39.5	64.4	46.2	32.6	39.5	64.3	46.2	32.7
	0:09:00	1:54:00		38.3	67.1	50.8	32.6	38.4	67.1	50.8	32.8
	0:10:00	1:55:00		52.3	85.7	63.9	33.9	52.3	85.6	63.8	33.9
	0:11:00	1:56:00		35.3	60.8	42	31.1	35.4	60.8	42	31.4
	0:12:00	1:57:00		36.4	74.1	49.1	32.1	36.4	74.1	49	32.3
	0:13:00	1:58:00		40.4	70.6	48.8	32.6	40.4	70.6	48.7	32.7
	0:14:00	1:59:00		40.5	72.6	51.8	32.1	40.5	72.6	51.7	32.2
	0:15:00	2:00:00		48.6	79.4	60.1	32	48.6	79.4	60.1	32.2
Study #17	0:01:00	2:01:00		38	75	51.9	30.8	38	75	51.9	31
Receptor 10 (R10)	0:02:00	2:02:00		32	52.7	34.5	31.1	32.1	52.6	34.6	31.2
	0:03:00	2:03:00		34.7	62.3	41.9	31.8	34.7	62.5	41.9	32
	0:04:00	2:04:00		33	55.3	35.9	31.5	33.1	55.7	35.9	31.6
	0:05:00	2:05:00		32.7	52.3	34	32	32.8	52.2	34	32.1
	0:06:00	2:06:00		32.7	58	34.1	31.6	32.7	58.2	34.1	31.7
	0:07:00	2:07:00		32.5	49.9	33.9	31.5	32.6	49.7	34	31.6
	0:08:00	2:08:00		32.1	54.2	34.4	31.1	32.2	54.3	34.4	31.2
	0:09:00	2:09:00		32.1	50.9	33.6	31	32.2	51.2	33.7	31.1
	0:10:00	2:10:00		33.9	56.6	36.9	31.9	34	56.5	36.9	32
	0:11:00	2:11:00		55.8	84.5	70	31.3	55.7	84.5	70	31.4
	0:12:00	2:12:00		33.2	62.7	37	31.5	33.3	62.6	37	31.7
	0:13:00	2:13:00		39.8	77	53.1	31.1	39.8	77	53	31.3
	0:14:00	2:14:00		37.1	73.9	49.3	31.6	37.1	73.9	49.3	31.7
	0:15:00	2:15:00		35.5	61.9	42	31.4	35.5	62.1	41.9	31.5

15-Minute (Study #15)

L_{eq} 48.4

L_{dn} 48.4

CNEL 48.4

15-Minute (Study #16)

L_{eq} 43.4

L_{dn} 43.4

CNEL 43.4

15-Minute (Study #17)

L_{eq} 44.5

L_{dn} 44.5

CNEL 44.5

Time	Date	L_{eq} $10^{(Leq/10)}$	Day/Night (L_{dn}) Adjusted	L_{dn} $10^{(Leq/10)}$	CNEL Adjusted	CNEL $10^{(Leq/10)}$
12:41 PM	10/22/2020	3388.4	35.3	3388.4	35.3	3388.4
12:42 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
12:43 PM	10/22/2020	3890.5	35.9	3890.5	35.9	3890.5
12:44 PM	10/22/2020	2344.2	33.7	2344.2	33.7	2344.2
12:54 PM	10/22/2020	1023293.0	60.1	1023293.0	60.1	1023293.0
12:55 PM	10/22/2020	794.3	29.0	794.3	29.0	794.3
12:56 PM	10/22/2020	2041.7	33.1	2041.7	33.1	2041.7
12:57 PM	10/22/2020	1288.2	31.1	1288.2	31.1	1288.2
12:58 PM	10/22/2020	851.1	29.3	851.1	29.3	851.1
12:59 PM	10/22/2020	1071.5	30.3	1071.5	30.3	1071.5
1:00 PM	10/22/2020	1778.3	32.5	1778.3	32.5	1778.3
1:01 PM	10/22/2020	1737.8	32.4	1737.8	32.4	1737.8
1:02 PM	10/22/2020	1258.9	31.0	1258.9	31.0	1258.9
1:03 PM	10/22/2020	1096.5	30.4	1096.5	30.4	1096.5
1:04 PM	10/22/2020	933.3	29.7	933.3	29.7	933.3
1:05 PM	10/22/2020	955.0	29.8	955.0	29.8	955.0
1:06 PM	10/22/2020	1349.0	31.3	1349.0	31.3	1349.0
1:07 PM	10/22/2020	3090.3	34.9	3090.3	34.9	3090.3
1:08 PM	10/22/2020	1819.7	32.6	1819.7	32.6	1819.7
1:15 PM	10/22/2020	12022.6	40.8	12022.6	40.8	12022.6
1:16 PM	10/22/2020	2187.8	33.4	2187.8	33.4	2187.8
1:17 PM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9
1:18 PM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5
1:19 PM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6
1:20 PM	10/22/2020	2290.9	33.6	2290.9	33.6	2290.9
1:21 PM	10/22/2020	2951.2	34.7	2951.2	34.7	2951.2
1:22 PM	10/22/2020	8912.5	39.5	8912.5	39.5	8912.5
1:23 PM	10/22/2020	6760.8	38.3	6760.8	38.3	6760.8
1:24 PM	10/22/2020	169824.4	52.3	169824.4	52.3	169824.4
1:25 PM	10/22/2020	3388.4	35.3	3388.4	35.3	3388.4
1:26 PM	10/22/2020	4365.2	36.4	4365.2	36.4	4365.2
1:27 PM	10/22/2020	10964.8	40.4	10964.8	40.4	10964.8
1:28 PM	10/22/2020	11220.2	40.5	11220.2	40.5	11220.2
1:29 PM	10/22/2020	72443.6	48.6	72443.6	48.6	72443.6
1:35 PM	10/22/2020	6309.6	38.0	6309.6	38.0	6309.6
1:36 PM	10/22/2020	1584.9	32.0	1584.9	32.0	1584.9
1:37 PM	10/22/2020	2951.2	34.7	2951.2	34.7	2951.2
1:38 PM	10/22/2020	1995.3	33.0	1995.3	33.0	1995.3
1:39 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1
1:40 PM	10/22/2020	1862.1	32.7	1862.1	32.7	1862.1
1:41 PM	10/22/2020	1778.3	32.5	1778.3	32.5	1778.3
1:42 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
1:43 PM	10/22/2020	1621.8	32.1	1621.8	32.1	1621.8
1:44 PM	10/22/2020	2454.7	33.9	2454.7	33.9	2454.7
1:45 PM	10/22/2020	380189.4	55.8	380189.4	55.8	380189.4
1:46 PM	10/22/2020	2089.3	33.2	2089.3	33.2	2089.3
1:47 PM	10/22/2020	9549.9	39.8	9549.9	39.8	9549.9
1:48 PM	10/22/2020	5128.6	37.1	5128.6	37.1	5128.6
1:49 PM	10/22/2020	3548.1	35.5	3548.1	35.5	3548.1

APPENDIX D

Source Noise & Project Impacts – Reservoir Excavation

Processing Plant(s) - Measured Noise Level

Otay Mesa Facility (2020)

Aggregate Plant + Crushing/Recycle Plant - Noise Measurements (Otay Mesa)							
		Measured Noise Levels			Reference Noise Levels		
Location #	Measurement #	Measured L_{eq}	Measured L_{eq} (Combined)	Distance from Source (feet)	Reference Distance (feet) [A]	L_{eq} @ 50-feet [B]	L_{eq} @ 50-feet (Combined)
Location #1	#1	76.0	81.2	205	50	88.3	93.4
	#2	80.6				92.9	
	#3	83.8				96.1	
Location #2	#1	79.4	76.4	145	50	88.6	85.7
	#2	76.3				85.5	
	#3	61.9				71.1	
Location #3	#1	77.7	80.7	42	50	76.2	79.2
	#2	83.7				82.2	
	#3	77.9				76.4	
Location #4	#1	83.4	81.5	51	50	83.6	81.6
	#2	74.3				74.5	
	#3	82.4				82.6	
Location #5	#1	83.0	81.0	54	50	83.7	81.7
	#2	82.2				82.9	
	#3	72.1				72.8	
Location #6	#1	85.1	82.7	78	50	89.0	86.5
	#2	76.7				80.6	
Location #7	#1	79.0	78.2	96	50	84.7	83.8
	#2	77.1				82.8	
Location #8	#1	83.4	83.4	140	50	92.3	92.3
Location #9	#1	73.3	73.3	120	50	80.9	80.9
Location #10	#1	72.8	72.8	70	50	75.7	75.7
					Processing Plant(s) Noise Level (L_{eq}) - Statistical Average @ 50-feet [C]:		**84.1** dBA

A - Distances (feet) estimated using Google Earth ™.

B - L_{eq}Calc = Selected_L_{eq} - 20*log(D/100). "Selected_L_{eq}" = reference noise level @ 50-feet. D = distance to location/receptor (feet).
Source: Federal Highway Administration's *Roadway Construction Noise Model* (FHWA, 2006).

C - A total of 22 noise measurements (3-minutes each) were collected at 10 locations surrounding the processing/crushing equipment at the Otay Mesa facility on July 27, 2020. Measurements were collected while the processing/crushing equipment was operating at approximately full capacity and within line-of-sight of the noise source(s). Additionally, at least 1 other offroad vehicle was operating nearby within the Otay Mesa site during the noise measurements. By capturing noise from the processing/crushing operation and other offroad vehicle(s) performing unrelated tasks, the measurements overestimate the noise generated by the processing/crushing operations alone. Noise measurements were then statistically combined/averaged to determine an average source noise level (84.1 dBA) at a reference distance of 50-feet.

Reservoir Excavation

Equipment Noise/Noise Levels @ Receptors

Reservoir Excavation - Mobile Equipment				
Equipment	**L_{max} at 50-feet**	**Usage Factor (%) [B]**	**L_{eq} at 50-feet [C]**	**L_{eq} $10^{(Leq/10)}$**
Loader	80	40%	76	40000000.00
Loader	80	40%	76	40000000.00
Loader	80	40%	76	40000000.00
Loader	80	40%	76	40000000.00
Excavator	85	40%	81	126491106.41
Haul Truck [A]	84	40%	80	100475457.26
Haul Truck [A]	84	40%	80	100475457.26
Water Truck [A]	84	40%	80	100475457.26
			Total L_{eq} @ 50-feet:	**87.7**

A - Utilized "Dump Truck" reference noise levels from FHWA Roadway Construction Noise Model (FHWA, 2006).

Reservoir Excavation - Processing Equipment			
Equipment	**L_{eq} at 50-feet**	**L_{eq} $10^{(Leq/10)}$**	**Source of Data**
Aggregate Plant	84.1	256984508.3	The Aggregate Plant and the Crushing/Recycle Plant noise levels are based on field measurements of rock crushing/recycling activities from a previous Sespe noise study completed in Otay Mesa, California (Sespe, 2020). This reference data conservative represents WCSG's proposed onsite operations. See Appendix D for relevant equipment measurement data and additional explanation from the Sespe's 2020 study.
Crushing Plant	84.1	256984508.3	
Total L_{eq} @ 50-feet:		**87.1**	

Reservoir Excavation - Unmitigated Onsite Noise Levels					
Receptor	**Mobile Noise Sources**		**Processing Noise Sources**		**Reservoir Excavation - Total Project Noise Level @ Receptor**
	Distance - Mobile Sources to Receptor (feet) [C]	**Noise Level @ Receptor (dBA) [D]**	**Distance - Stationary Sources to Receptor (feet) [C]**	**Noise Level @ Receptor (dBA) [D]**	
R1	465	68.3	465	67.7	71.1
R2	4,978	47.7	4,978	47.1	50.5
R3	3,980	49.7	3,980	49.1	52.4
R4	4,190	49.2	4,190	48.6	52.0
R5	2,560	53.5	2,560	52.9	56.2
R6	2,539	53.6	2,539	53.0	56.3
R7	2,382	54.1	2,382	53.5	56.9
R8	3,262	51.4	3,262	50.8	54.1
R9	4,251	49.1	4,251	48.5	51.8
R10	3,891	49.9	3,891	49.3	52.6

A - Default equipment noise data (Lmax, Usage Factor %, Reference Distance) for dozers was taken from Federal Highway Administration's (FHWA) Roadway Construction Noise Model (FHWA, 2006)

B - $L_{eq}(h) = L_{max}$ @ 50-feet - 20log(D/50) + 10log(UF). D = distance of interest (50-feet). UF = usage factor. Sources: FHWA Roadway Construction Noise Mode (2006), Caltrans Technical Noise Supplement (2013).

C - Distance estimated using Google Earth™. Represents closest distance between active equipment area and receptor. Please Figure 5 (Appendix A) for more detail.

D - L_{eq} @ receptor = L_{eq} @ 50-feet - 20*log(D/50). D = distance to receptor (feet).

Reservoir Excavation - Day-Night Noise Levels @ Receptors

Reservoir Excavation - Operational Parameter [A]	
Operating Hours	4:00 a.m. - 6:00 p.m.
Max Hours/Day	14 hours

Reservoir Excavation - Hourly (L_{eq}) Max Noise Level @ Receptors [B]										
Receptor	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Noise Level (L_{eq}) @ Receptor	71.1	50.5	52.4	52.0	56.2	56.3	56.9	54.1	51.8	52.6

Time/Hour [C]	R1		R2		R3		R4		R5		R6		R7		R8		R9		R10	
	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$
12:00 AM	0.0	1.0	0.0	1.0	0.0		0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
1:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
2:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
3:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
4:00 AM	81.1	127400450.3	60.5	1111647.5	62.4	1739044.6	62.0	1569093.5	66.2	4203363.4	66.3	4273182.8	66.9	4855046.1	64.1	2588862.3	61.8	1524385.0	62.6	1819509.8
5:00 AM	81.1	127400450.3	60.5	1111647.5	62.4	1739044.6	62.0	1569093.5	66.2	4203363.4	66.3	4273182.8	66.9	4855046.1	64.1	2588862.3	61.8	1524385.0	62.6	1819509.8
6:00 AM	81.1	127400450.3	60.5	1111647.5	62.4	1739044.6	62.0	1569093.5	66.2	4203363.4	66.3	4273182.8	66.9	4855046.1	64.1	2588862.3	61.8	1524385.0	62.6	1819509.8
7:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
8:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
9:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
10:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
11:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
12:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
1:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
2:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
3:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
4:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
5:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
6:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
9:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
10:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
11:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Day-Night (L_{dn}) Noise Level [C]:	**73.4**		**52.8**		**54.9**		**54.3**		**58.6**		**58.6**		**59.2**		**56.5**		**54.2**		**54.9**	

A - Per information provided by West Coast Sand and Gravel (WCSG), reservoir excavation activities will be limited to Monday through Saturday, between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier).

B - Please see the previous source noise calculations. Values shown represents the worst-case hourly (L_{eq}) noise level at each receptor resulting from the operation of Project excavation equipment (e.g., processing plant[s], loaders, excavator, haul/water trucks). It was assumed that the onsite equipment would operate at-grade, simultaneously in the Project site location closest to each affected receptor. Please see Figure 5 (Appendix A) which shows the distances analyzed.

C - Because the County criteria applies to noise impacts over a 24-hour period (i.e., Day-Night [L_{dn}] noise levels), it was assumed that the onsite equipment summarized above would operate simultaneously for up to 14-hours (4:00 a.m. - 6:00 p.m.) in a given day. These hourly (L_{eq}) noise levels were then used to estimate the Ldn noise levels at each receptor. Please note, for noise occurring between the hours of 10:00 p.m. and 7:00 a.m., and additional +10 dBA weighting is applied .

Reservoir Excavation - Project Impacts @ Receptors

Reservoir Excavation - Project Noise Levels (L_{dn}) @ Receptors						
Receptor	**Ambient Noise Level [A]**	**Project Noise Level [B]**	**Total Noise Level [C]**	**Tulare County Threshold [D]**	**Significant?**	**Exceedance**
R1	47.6	73.4	73.4	60	**Yes**	13.4
R2	51.7	52.8	55.3	60	No	---
R3	59.3	54.9	60.6	62.3	No	---
R4	44.7	54.3	54.7	60	No	---
R5	57.4	58.6	61.0	60.4	**Yes**	0.6
R6	57.4	58.6	61.1	60.4	**Yes**	0.7
R7	52.5	59.2	60.0	60	No	---
R8	56.0	56.5	59.3	60	No	---
R9	51.8	54.2	56.1	60	No	---
R10	47.8	54.9	55.7	60	No	---

Note: Values shown in **bold** represent an exceedance of the applicable Tulare County Day-Night (L_{dn}) significance threshold.

A - Please see Appendix B for a detailed summary of the ambient noise measurements collected at each Project receptor.

B - Please see the source noise calculations for "Reservoir Excavation" phase presented previously.

C - Values shown represents the total estimated noise level resulting from the operation of Project noise sources (e.g., processing plant[s], mobile equipment, etc.) combined with the measured ambient noise level at each receptor.

D - Significance thresholds shown represent appropriate Tulare County noise thresholds (see Appendix B for more detail). Please note In cases where the existing ambient noise levels already exceed the applicable standard or are within ±1 dBA of the applicable significance threshold, the noise standard is increased by +3 dBA increments to encompass the ambient noise.

APPENDIX E

Insertion Calculations & Mitigated Project Impacts (Reservoir Excavation)

Excavation Pit Insertion Loss Calculations @ R1

Pit Wall Sound Barrier Noise Attenuation

Insertion Loss Calculations @ Receptor 1 (R1)

Insertion Loss (IL) Equation = 5dB + 20log((√2πN)/tanh(√2pN))dB

Source: Center for Transportation Research's *Design Guide for Highway Noise Barriers* (2003)

Caltrans *Technical Noise Supplement* offers the following guidance (Caltrans, 2013):
"Given the same site cross section, distance between source and receiver, and barrier height, a berm allows greater barrier attenuation than the thin screen (wedge), such as a soundwall. In general the actual extra attenuation associated with a berm is somewhere between -1 and -3 dBA."

Fresnel Number (N): $((a + b - \ell)f)/c_0$

Note: Fresnel number (N) is a nondimensional measure of how much farther the sound must travel as a result of the barrier.

ℓ - The original length of the direct path from source to receiver (ft.)
a - Path length from barrier to source (ft.)
b - Path length from barrier to receiver (ft.)
f - Equipment sound frequency in hertz (Hz)
c_0 - Speed of sound propagation in air (approximately 1,100 ft./sec.)

Project Data[B]

ℓ -	707.01	feet	(total distance between excavation/processing equipment and R1 property boundary)
a -	217.15	feet	(direct distance between the top edge of the proposed excavation pit and top of excavation equipment)
b -	490.03	feet	(direct distance between the top edge of the proposed excavation pit and R1 property boundary)
f -	2,000	hertz	(2000 is appropriate for crushing/screening)

Exacation Pit Noise Attenuation @ R1

Excavation Pit Depth (ft.)	Top of Pit to Source (a)	Top of Pit to Receiver (b)	Source to Receiver (c)	Fresnel Number (N)	Estimated Insertion Loss (dB) [A]
8	217.15	490.03	707.01	0.32	11.0
12	217.18	490.08	707.01	0.46	12.2
16	**217.29**	**490.15**	**707.01**	**0.80**	**14.2**
20	217.48	490.26	707.01	1.32	16.3
24	217.74	490.39	707.01	2.04	18.1
28	218.07	490.56	707.01	2.95	19.7
32	218.47	490.77	707.01	4.06	21.1
36	218.95	491.01	707.01	5.35	22.3

FOOTNOTES:

Note - Reservoir excavation equipment (e.g., processing plant[s], loaders, excavator, haul/water trucks, etc.) height is estimated to be 8-feet. Therefore, line-of-sight between equipment and receivers (e.g., R1) is not broken until the excavation pit reaches a minimum depth of at least 8-feet below ground surface (bgs).

A - Per Caltrans *Technical Noise Supplement* (2013) guidance referenced above, an additional -2 dB of noise attenuation is assumed due to barrier being constructed of "earthen berm" as opposed to a soundwall.

B - Transmission path data presented assumes that receiver (i.e., nearby resident) height is 5-feet above the ground and equipment height is 8-feet above the ground.

Reservoir Excavation - Day-Night Noise Levels @ Receptors

Mitigation Measure NO-1 (Restrict Onsite Processing Operating Hours)

Reservoir Excavation - Operational Parameter [A]		
Operating Hours	Excavation	4:00 a.m. - 6:00 p.m.
	Material Processing	7:00 a.m. - 6:00 p.m.
Max Hours/Day		14 hours

Reservoir Excavation - Hourly (L_{eq}) Max Noise Level @ Receptors [B]										
Receptor	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Mobile Equipment - Noise Level (L_{eq}) @ Receptor	68.3	47.7	49.7	49.2	53.5	53.6	54.1	51.4	49.1	49.9
Stationary Equipment - Noise Level (L_{eq}) @ Receptor	67.7	47.1	49.1	48.6	52.9	53.0	53.5	50.8	48.5	49.3

Time/Hour [C]	R1		R2		R3		R4		R5		R6		R7		R8		R9		R10	
	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$
12:00 AM	0.0	1.0	0.0	1.0	0.0		0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
1:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
2:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
3:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
4:00 AM	78.3	67975196.9	57.7	593125.5	59.7	927876.6	59.2	837198.3	63.5	2242727.2	63.6	2279979.7	64.1	2590436.0	61.4	1381301.4	59.1	813343.8	59.9	970809.3
5:00 AM	78.3	67975196.9	57.7	593125.5	59.7	927876.6	59.2	837198.3	63.5	2242727.2	63.6	2279979.7	64.1	2590436.0	61.4	1381301.4	59.1	813343.8	59.9	970809.3
6:00 AM	78.3	67975196.9	57.7	593125.5	59.7	927876.6	59.2	837198.3	63.5	2242727.2	63.6	2279979.7	64.1	2590436.0	61.4	1381301.4	59.1	813343.8	59.9	970809.3
7:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
8:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
9:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
10:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
11:00 AM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
12:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
1:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
2:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
3:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
4:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
5:00 PM	71.1	12740045.0	50.5	111164.7	52.4	173904.5	52.0	156909.3	56.2	420336.3	56.3	427318.3	56.9	485504.6	54.1	258886.2	51.8	152438.5	52.6	181951.0
6:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
9:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
10:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
11:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Day-Night (L_{dn}) Noise Level:	**71.6**		**51.0**		**53.1**		**52.5**		**56.7**		**56.8**		**57.4**		**54.6**		**52.3**		**53.1**	

A - Per proposed Mitigation Measure NO-1 would limit onsite material processing operations to the hours of 7:00 a.m. and 6:00 p.m., until the excavation reaches a minimum depth of 16-feet below ground surface (bgs), and the processing plant is placed within the pit.
Reservoir excavation activities would not change, and would continue to occur Monday through Saturday, between the hours of 4:30 a.m. (or dawn if later) and 6:00 p.m. (or sundown if earlier).

B - Please see the previous source noise calculations. Values shown represents the mitigated hourly (L_{eq}) noise level at each receptor resulting from the operation of Project excavation equipment (e.g., processing plant[s], loaders, excavator, haul/water trucks).
It was assumed that the onsite equipment would operate at-grade, simultaneously in the Project site location closest to each affected receptor. Please see Figure 5 (Appendix A) which shows the distances analyzed.

C - Because the County criteria applies to noise impacts over a 24-hour period (i.e., Day-Night [L_{dn}] noise levels), it was assumed that the onsite excavation equipment would operate simultaneously for up to 14-hours (4:00 a.m. - 6:00 p.m.) in a given day.
Per proposed Mitigation Measure NO-1, onsite material processing operations would be limited to the hours of 7:00 a.m. and 6:00 p.m., until the excavation reaches a minimum depth of 16-feet below ground surface (bgs)
These hourly (L_{eq}) noise levels were then used to estimate the L_{dn} noise levels at each receptor. Please note, for noise occurring between the hours of 10:00 p.m. and 7:00 a.m., and additional +10 dBA weighting is applied .

Reservoir Excavation - Project Impacts @ Receptors

Mitigation Measure NO-1 (Restrict Onsite Processing Operating Hours)

Reservoir Excavation - Mitigated Project Noise Levels (L_{dn}) @ Receptors						
Receptor	**Ambient Noise Level [A]**	**Project Noise Level [B]**	**Total Noise Level [C]**	**Tulare County Threshold [D]**	**Significant?**	**Exceedance**
R1	47.6	71.6	71.6	60	**Yes**	11.6
R2	51.7	51.0	54.4	60	No	---
R3	59.3	53.1	60.2	62.3	No	---
R4	44.7	52.5	53.1	60	No	---
R5	57.4	56.7	60.1	60.4	No	---
R6	57.4	56.8	60.1	60.4	No	---
R7	52.5	57.4	58.6	60	No	---
R8	56.0	54.6	58.4	60	No	---
R9	51.8	52.3	55.1	60	No	---
R10	47.8	53.1	54.2	60	No	---

Note: Values shown in **bold** represent an exceedance of the applicable Tulare County Day-Night (L_{dn}) significance threshold.

A - Please see Appendix B for a detailed summary of the ambient noise measurements collected at each Project receptor.

B - Please see the source noise calculations for "Mitigated Reservoir Excavation" phase presented previously.

C - Values shown represents the total estimated noise level resulting from the operation of Project noise sources (e.g., processing plant[s], mobile equipment, etc.) combined with the measured ambient noise level at each receptor.

D - Significance thresholds shown represent appropriate Tulare County noise thresholds (see Appendix B for more detail). Please note In cases where the existing ambient noise levels already exceed the applicable standard or are within ±1 dBA of the applicable significance threshold, the noise standard is increased by +3 dBA increments to encompass the ambient noise.

APPENDIX F

Source Noise & Project Impacts – Reservoir Construction

Reservoir Construction

Equipment Noise/Noise Levels @ Receptors

Reservoir Construction - Mobile Equipment				
Equipment	**L_{max} at 50-feet**	**Usage Factor (%)**	**L_{eq} at 50-feet**	**L_{eq} $10^{(Leq/10)}$**
Loader	80	40%	76	40000000.00
Excavator	85	40%	81	126491106.41
Backhoe	80	40%	76	40000000.00
Grader	85	40%	81	126491106.41
Trencher [A]	80	40%	76	40000000.00
Compactor	80	20%	73	20000000.00
Crane	85	16%	77	50596442.56
Cement Truck	85	40%	81	126491106.41
Water Truck [B]	84	40%	80	100475457.26
Generator	82	50%	79	79244659.62
Pumps	77	50%	74	25059361.68
			Total L_{eq} @ 50-feet:	**88.9**

A - Utilized "Backhoe" reference noise levels from FHWA RCNM (FHWA, 2006).

B - Utilized "Dump Truck" reference noise levels from FHWA RCNM (FHWA, 2006).

Reservoir Construction - Unmitigate Onsite Noise Levels		
Receptor	**Distance - Mobile Sources to Receptor (feet)**	**Reservoir Excavation - Total Project Noise Level @ Receptor**
R1	465	69.5
R2	4,978	48.9
R3	3,980	50.9
R4	4,190	50.4
R5	2,560	54.7
R6	2,539	54.8
R7	2,382	55.3
R8	3,262	52.6
R9	4,251	50.3
R10	3,891	51.1

Reservoir Construction - Day-Night Noise Levels @ Receptors

Reservoir Construction - Operational Parameter	
Operating Hours	4:00 a.m. - 6:00 p.m.
Max Hours/Day	14 hours

Reservoir Construction - Hourly (L_{eq}) Max Noise Level @ Receptors										
Receptor	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Noise Level (L_{eq}) @ Receptor	69.5	48.9	50.9	50.4	54.7	54.8	55.3	52.6	50.3	51.1

Time/Hour	R1		R2		R3		R4		R5		R6		R7		R8		R9		R10	
	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$
12:00 AM	0.0	1.0	0.0	1.0	0.0		0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
1:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
2:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
3:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
4:00 AM	79.5	89588303.9	58.9	781713.2	60.9	1222900.4	60.4	1103390.3	64.7	2955815.3	64.8	3004912.4	65.3	3414080.1	62.6	1820494.2	60.3	1071951.2	61.1	1279483.7
5:00 AM	79.5	89588303.9	58.9	781713.2	60.9	1222900.4	60.4	1103390.3	64.7	2955815.3	64.8	3004912.4	65.3	3414080.1	62.6	1820494.2	60.3	1071951.2	61.1	1279483.7
6:00 AM	79.5	89588303.9	58.9	781713.2	60.9	1222900.4	60.4	1103390.3	64.7	2955815.3	64.8	3004912.4	65.3	3414080.1	62.6	1820494.2	60.3	1071951.2	61.1	1279483.7
7:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
8:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
9:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
10:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
11:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
12:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
1:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
2:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
3:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
4:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
5:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
6:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
9:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
10:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
11:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Day-Night (L_{dn}) Noise Level:	**71.8**		**51.3**		**53.4**		**52.8**		**57.0**		**57.1**		**57.7**		**54.9**		**52.6**		**53.4**	

Reservoir Construction - Project Impacts @ Receptors

Reservoir Construction - Project Noise Levels (L_{dn}) @ Receptors						
Receptor	**Ambient Noise Level**	**Project Noise Level**	**Total Noise Level**	**Tulare County Threshold**	**Significant?**	**Exceedance**
R1	47.6	71.8	71.9	60	**Yes**	11.9
R2	51.7	51.3	54.5	60	No	---
R3	59.3	53.4	60.3	62.3	No	---
R4	44.7	52.8	53.4	60	No	---
R5	57.4	57.0	60.2	60.4	No	---
R6	57.4	57.1	60.3	60.4	No	---
R7	52.5	57.7	58.8	60	No	---
R8	56.0	54.9	58.5	60	No	---
R9	51.8	52.6	55.2	60	No	---
R10	47.8	53.4	54.4	60	No	---

Reservoir Construction - Day-Night Noise Levels @ Receptors

Reservoir Construction - Operational Parameter	
Operating Hours	7:00 a.m. - 6:00 p.m.
Max Hours/Day	11 hours

Reservoir Construction - Hourly (L_{eq}) Max Noise Level @ Receptors										
Receptor	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Noise Level (L_{eq}) @ Receptor	69.5	48.9	50.9	50.4	54.7	54.8	55.3	52.6	50.3	51.1

Time/Hour	R1		R2		R3		R4		R5		R6		R7		R8		R9		R10	
	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$
12:00 AM	0.0	1.0	0.0	1.0	0.0		0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
1:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
2:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
3:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
4:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
5:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
6:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
8:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
9:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
10:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
11:00 AM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
12:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
1:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
2:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
3:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
4:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
5:00 PM	69.5	8958830.4	48.9	78171.3	50.9	122290.0	50.4	110339.0	54.7	295581.5	54.8	300491.2	55.3	341408.0	52.6	182049.4	50.3	107195.1	51.1	127948.4
6:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
9:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
10:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
11:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Day-Night (L_{dn}) Noise Level:	**66.1**		**45.5**		**47.7**		**47.0**		**51.3**		**51.4**		**51.9**		**49.2**		**46.9**		**47.7**	

Reservoir Construction - Project Impacts @ Receptors

Reservoir Construction - Project Noise Levels (L_{dn}) @ Receptors						
Receptor	**Ambient Noise Level**	**Project Noise Level**	**Total Noise Level**	**Tulare County Threshold**	**Significant?**	**Exceedance**
R1	47.6	66.1	66.2	60	**Yes**	6.2
R2	51.7	45.5	52.6	60	No	---
R3	59.3	47.7	59.6	62.3	No	---
R4	44.7	47.0	49.0	60	No	---
R5	57.4	51.3	58.4	60.4	No	---
R6	57.4	51.4	58.4	60.4	No	---
R7	52.5	51.9	55.2	60	No	---
R8	56.0	49.2	56.8	60	No	---
R9	51.8	46.9	53.0	60	No	---
R10	47.8	47.7	50.7	60	No	---

APPENDIX G

Source Noise & Project Impacts – Reservoir Operations

Reservoir Operations

Equipment Noise/Noise Levels @ Receptors

Reservoir Operations - Mobile Equipment				
Equipment	**L_{max} at 50-feet**	**Usage Factor (%)**	**L_{eq} at 50-feet**	**L_{eq} $10^{(Leq/10)}$**
Loader	80	40%	76	40000000.00
Grader	85	40%	81	126491106.41
Dump Truck	84	40%	80	100475457.26
Generator	82	50%	79	79244659.62
			Total L_{eq} @ 50-feet:	**85.4**

Reservoir Operations - Unmitigate Onsite Noise Levels		
Receptor	**Distance - Mobile Sources to Receptor (feet)**	**Reservoir Excavation - Total Project Noise Level @ Receptor**
R1	465	66.0
R2	4,978	45.4
R3	3,980	47.4
R4	4,190	46.9
R5	2,560	51.2
R6	2,539	51.3
R7	2,382	51.8
R8	3,262	49.1
R9	4,251	46.8
R10	3,891	47.6

Reservoir Operations - Day-Night Noise Levels @ Receptors

Reservoir Operations - Operational Parameter	
Operating Hours	7:00 a.m. - 5:00 p.m.
Max Hours/Day	10 hours

Reservoir Operations - Hourly (L_{eq}) Max Noise Level @ Receptors										
Receptor	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**
Noise Level (L_{eq}) @ Receptor	66.0	45.4	47.4	46.9	51.2	51.3	51.8	49.1	46.8	47.6

Time/Hour	R1		R2		R3		R4		R5		R6		R7		R8		R9		R10	
	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$	Hourly L_{eq} (dBA)	L_{eq} $10^{(Leq/10)}$
12:00 AM	0.0	1.0	0.0	1.0	0.0		0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
1:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
2:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
3:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
4:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
5:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
6:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 AM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 AM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
9:00 AM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
10:00 AM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
11:00 AM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
12:00 PM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
1:00 PM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
2:00 PM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
3:00 PM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
4:00 PM	66.0	4002904.7	45.4	34927.8	47.4	54640.5	46.9	49300.7	51.2	132069.1	51.3	134262.8	51.8	152544.9	49.1	81341.7	46.8	47896.0	47.6	57168.7
5:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
6:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
7:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
8:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
9:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
10:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
11:00 PM	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0
Day-Night (L_{dn}) Noise Level:	**61.8**		**41.2**		**43.3**		**42.7**		**46.9**		**47.0**		**47.6**		**44.8**		**42.5**		**43.3**	

Reservoir Operations - Project Impacts @ Receptors

Reservoir Operations - Project Noise Levels (L_{dn}) @ Receptors						
Receptor	**Ambient Noise Level**	**Project Noise Level**	**Total Noise Level**	**Tulare County Threshold**	**Significant?**	**Exceedance**
R1	47.6	61.8	61.9	60	**Yes**	1.9
R2	51.7	41.2	52.1	60	No	---
R3	59.3	43.3	59.4	62.3	No	---
R4	44.7	42.7	46.8	60	No	---
R5	57.4	46.9	57.8	60.4	No	---
R6	57.4	47.0	57.8	60.4	No	---
R7	52.5	47.6	53.7	60	No	---
R8	56.0	44.8	56.3	60	No	---
R9	51.8	42.5	52.3	60	No	---
R10	47.8	43.3	49.1	60	No	---

APPENDIX H

Vibration Impact Assessment

Vibration Impact Assessment

Reservoir Excavation

Equipment Reference Vibration Source		
Equipment	**Distance (feet)**	**PPV (in/sec)**
Large Bulldozer	25	0.089

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020).

Note: Large Bulldozer represents the largest, most powerful vibration source operating onsite. Therefore it is used to calculate worst-case vibration impacts to nearby receivers.

Human Responses to Transient Vibration	
PPV (in/sec)	**Human Response**
2	Severe
0.9	Strongly Perceptible
0.24	Distinctly Perceptible
0.035	Barely Perceptible

Source: *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020).

Vibration Impact Assessment						
Receptor/Site	**Receiver Type**	**Distance (feet) [B]**	**Predicted Vibration PPV @ Receiver (in/sec) [A]**	**Applicable Caltrans PPV Threshold (in/sec)**	**Significant?**	**Predicted Human Response @ Receptor**
R1	Residential	465	0.0036	≥ 0.035	No	Barely Perceptible
R2	Residential	4,978	0.0003	≥ 0.035	No	Barely Perceptible
R3	Residential	3,980	0.0003	≥ 0.035	No	Barely Perceptible
R4	Residential	4,190	0.0003	≥ 0.035	No	Barely Perceptible
R5	Residential	2,560	0.0005	≥ 0.035	No	Barely Perceptible
R6	Residential	2,539	0.0006	≥ 0.035	No	Barely Perceptible
R7	Residential	2,382	0.0006	≥ 0.035	No	Barely Perceptible
R8	Residential	3,262	0.0004	≥ 0.035	No	Barely Perceptible
R9	Residential	4,251	0.0003	≥ 0.035	No	Barely Perceptible
R10	Residential	3,891	0.0003	≥ 0.035	No	Barely Perceptible

FOOTNOTES:

A - $PPV_{Equipment} = PPV_{Ref} (25/D)^{n}$. PPV_{Ref} = reference PPV @ 25-ft. D = distance from equipment to the receiver in ft. n = 1.1 (the value related to the attenuation rate through ground) Source is the Caltrans *Transportation and Construction Vibration Guidance Manual* (2020).

B - Distances estimated using Google Earth ™. Represents closest distance between active excavation area and the receptor property boundary.

See Figure 6 in Appendix A for more detail.

APPENDIX I

Quest DL SoundPro &
Quest QC-10 Certificates of Compliance and Calibration

APPENDIX I

Quest DL SoundPro &
Quest QC-10 Certificates of Compliance and Calibration

Certificate of Compliance and Calibration

Calibrated for:

Mr. Graham Stephens
Sespe Consulting, Inc.
1565 Hotel Circle South
Suite 370
San Diego, CA 92108

Client#S-100
EDI Job#CR6035-1
ID# 103

Calibration Conclusion	
As Received:In Tolerance	☒
As Received:Out of Tolerance	☐
As Left: In Tolerance	☒
As Left: Out of Tolerance	☐

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL-1/3 Sound Level Meter Type-2
Serial No.: BIJ090010, w/Microphone QE7052 SN: No38771, Pre-Amp SN: 0910 4962
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

As-Received Pre-Calibration Values: IN-TOLERANCE	ANSI S1.4-2014 Lower Talerance	Actual Value	ANSI S1.4-2014 Upper Tolerance	Compliance
Sound Pressure Level,114.0dB@1KHz	113.0	**114.2**	115.0	YES

As-Received Pre-Calibration Values: IN-TOLERANCE	ANSI S1.4-2014 Lower Tolerance	Actual Value	ANSI S1.4-2014 Upper Tolerance	Compliance
Sound Pressure Level,114.0dB@1KHz	113.0	**114.0**	115.0	YES

Acoustical Parameter Check (110 dB input)	ANSI S1.4 Lower Tolerance	Actual Value	ANSI S1.4 Upper Tolerance	Compliance
Fast Response dB	107.0	**109.9**	110.0	YES
Slow Rasponse dB	103.9	**105.9**	107.9	YES
Crest Factor dB	109.5	**110.0**	110.5	YES
Impulse Response	109.5	**110.0**	110.5	YES

Linearity Check	dB Input Level at 1000 Hz							
	130.0 dB	120.0 dB	110.0 dB	100.0 dB	90.0 dB	80.0 dB	70.0 dB	60.0 dB
Linearity Tolerance ±0.5 dB	130.0	120.0	110.0	100.0	90.0	80.0	70.0	59.9
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Electrical Linearity Check	dB Input Level at 1000 Hz				
	70.0 dB	60.0 dB	50.0 dB	40.0 dB	30.0 dB
Linearity Tolerance ±0.6 dB	70.0	60.0	50.0	40.0	30.2
Compliance	Yes	Yes	Yes	Yes	Yes

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Certificate of Compliance and Calibration

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL-1/3 Sound Level Meter Type-2
Serial No.: BIJ090010, w/Microphone QE7052 SN: No38771, Pre-Amp SN: 0910 4962
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

A-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	46.5	**49.8**	52.5	-50.5	± 3	Yes
31.5	57.6	**60.6**	61.5	-39.4	± 3	Yes
63	71.8	**73.9**	75.8	-26.2	± 2	Yes
125	82.4	**83.7**	85.4	-16.1	± 1.5	Yes
250	89.9	**91.2**	92.9	-8.6	± 1.5	Yes
500	95.3	**96.7**	98.3	-3.2	± 1.5	Yes
1K REF.	98.5	**100.0**	101.5	0	± 1.5	Yes
2K	99.2	**101.4**	103.2	1.2	± 2	Yes
4K	98.0	**102.3**	104.0	1	± 3	Yes
8K	93.9	**97.1**	103.9	-1.1	± 5	Yes
16K	---	**93.7**	98.4	-6.6	+5/-∞	Yes

C-weighted Frequency Response with 100 dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	90.8	**93.7**	96.8	-3.0	± 3	Yes
31.5	94.0	**97.0**	100.0	-3.0	± 3	Yes
63	97.2	**99.0**	101.2	-0.8	± 2	Yes
125	98.3	**99.5**	101.3	-0.2	± 1.5	Yes
250	98.5	**99.7**	101.5	0.0	± 1.5	Yes
500	98.5	**99.8**	101.5	0.0	± 1.5	Yes
1K REF.	98.5	**99.9**	101.5	0.0	± 1.5	Yes
2K	97.8	**99.9**	101.8	-0.2	± 2	Yes
4K	96.2	**100.5**	102.2	-0.8	± 3	Yes
8K	92.0	**95.2**	102.0	-3.0	± 5	Yes
16K	---	**91.7**	96.5	-8.5	+5/-∞	Yes

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Serial No.: BIJ090010, w/Microphone QE7052 SN: No38771, Pre-Amp SN: 0910 4962
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Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

Z-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	97.0	99.1	103.0	0.0	± 3	Yes
31.5	97.0	99.4	103.0	0.0	± 3	Yes
63	98.0	99.7	102.0	0.0	± 2	Yes
125	98.5	99.7	101.5	0.0	± 1.5	Yes
250	98.5	99.8	101.5	0.0	± 1.5	Yes
500	98.5	99.8	101.5	0.0	± 1.5	Yes
1K REF.	98.5	99.9	101.5	0.0	± 1.5	Yes
2K	98.0	100.1	102.0	0.0	± 2	Yes
4K	97.0	101.2	103.0	0.0	± 3	Yes
8K	95.0	97.6	105.0	0.0	± 5	Yes
16K	---	98.1	105.0	0.0	+5/-∞	Yes

Flat-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	97.0	99.8	103.0	0.0	± 3	Yes
31.5	97.0	**99.7**	103.0	0.0	± 3	Yes
63	98.0	**99.8**	102.0	0.0	± 2	Yes
125	98.5	**99.7**	101.5	0.0	± 1.5	Yes
250	98.5	**99.8**	101.5	0.0	± 1.5	Yes
500	98.5	**99.9**	101.5	0.0	± 1.5	Yes
1K REF.	98.5	**99.9**	101.5	0.0	± 1.5	Yes
2K	98.0	**100.1**	102.0	0.0	± 2	Yes
4K	97.0	**101.3**	103.0	0.0	± 3	Yes
8K	95.0	**98.2**	105.0	0.0	± 5	Yes
16K	---	**100.2**	105.0	0.0	+5/-∞	Yes

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Serial No.: BIJ090010, w/Microphone QE7052 SN: No38771, Pre-Amp SN: 0910 4962
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

OCTAVE BAND FILTER ROLL-OFF RESPONSE

Center Freq. Hz @ 110.0dB	Lower Band Limit	Limits dB 104.3/109.6	Upper Band Limit	Limits dB 104.3/109.6	Compliance
12	11.2Hz	106.1	14.1Hz	106.4	Yes
16	14.1Hz	106.2	17.8Hz	106.2	Yes
20	17.8Hz	106.8	22.4Hz	106.9	Yes
25	22.4Hz	106.6	28.2Hz	106.6	Yes
31.5	28.2Hz	106.4	35.5Hz	106.1	Yes
40	35.5Hz	106.5	44.7Hz	106.9	Yes
50	44.7Hz	106.8	56.2Hz	106.6	Yes
63	56.2Hz	106.8	70.8Hz	106.5	Yes
80	70.8Hz	106.5	89.1Hz	107.1	Yes
100	89.1Hz	106.5	112.0Hz	107.0	Yes
125	112.0Hz	106.3	141.0Hz	106.8	Yes
160	141.0Hz	106.5	178.0Hz	106.6	Yes
200	178.0Hz	106.9	224.0Hz	107.1	Yes
250	224.0Hz	106.9	282.0Hz	107.2	Yes
315	282.0Hz	106.7	355.0Hz	106.9	Yes
400	355.0Hz	106.6	447.0Hz	106.5	Yes
500	447.0Hz	106.9	562.0Hz	106.6	Yes
630	562.0Hz	106.5	708.0Hz	107.0	Yes
800	708.0Hz	106.2	891.0Hz	105.7	Yes
1,000	891.0Hz	106.7	1,122.0KHz	106.1	Yes
1,250	1,122.0KHz	106.6	1,413.0KHz	106.9	Yes
1,600	1,413.0KHz	106.5	1,778.0KHz	107.1	Yes
2,000	1,778.0KHz	106.5	2,239.0KHz	106.5	Yes
2,500	2,239.0KHz	106.9	2,818.0KHz	106.9	Yes
3,150	2,818.0KHz	106.5	3,548.0KHz	107.2	Yes
4,000	3,548.0KHz	106.5	4,467.0KHz	106.8	Yes
5,000	4,467.0KHz	106.5	5,623.0KHz	107.1	Yes
6,300	5,623.0KHz	106.4	7,079.0KHz	105.7	Yes
8,000	7,079.0KHz	106.9	8,913.0KHz	106.4	Yes
10,000	8,913.0KHz	106.6	11,220.0KHz	106.8	Yes
12,500	11,220.0KHz	106.3	14,130.0KHz	106.3	Yes
16,000	14,130.0KHz	106.4	17,780.0KHz	106.2	Yes

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Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

Center Freq. Hz @ 110.0dB	Lower Limits 109.7 dB	Data Found (dB)	Upper Limits 110.3dB	Deviation	Compliance
12.5	109.7 dB	110.0	110.3dB	0.0	YES
16	109.7 dB	110.0	110.3dB	0.0	YES
20	109.7 dB	110.0	110.3dB	0.0	YES
25	109.7 dB	109.9	110.3dB	-0.1	YES
31.5	109.7 dB	110.0	110.3dB	0.0	YES
40	109.7 dB	110.0	110.3dB	0.0	YES
50	109.7 dB	110.0	110.3dB	0.0	YES
63	109.7 dB	110.0	110.3dB	0.0	YES
80	109.7 dB	110.0	110.3dB	0.0	YES
100	109.7 dB	110.0	110.3dB	0.0	YES
125	109.7 dB	110.0	110.3dB	0.0	YES
160	109.7 dB	110.0	110.3dB	0.0	YES
200	109.7 dB	110.0	110.3dB	0.0	YES
250	109.7 dB	110.0	110.3dB	0.0	YES
315	109.7 dB	110.0	110.3dB	0.0	YES
400	109.7 dB	110.0	110.3dB	0.0	YES
500	109.7 dB	110.0	110.3dB	0.0	YES
630	109.7 dB	110.0	110.3dB	0.0	YES
800	109.7 dB	110.0	110.3dB	0.0	YES
1,000	109.7 dB	110.0	110.3dB	0.0	YES
1,250	109.7 dB	110.0	110.3dB	0.0	YES
1,600	109.7 dB	110.0	110.3dB	0.0	YES
2,000	109.7 dB	110.0	110.3dB	0.0	YES
2,500	109.7 dB	110.0	110.3dB	0.0	YES
3,150	109.7 dB	110.0	110.3dB	0.0	YES
4,000	109.7 dB	110.0	110.3dB	0.0	YES
5,000	109.7 dB	110.0	110.3dB	0.0	YES
6,300	109.7 dB	110.0	110.3dB	0.0	YES
8,000	109.7 dB	110.0	110.3dB	0.0	YES
10,000	109.7 dB	110.0	110.3dB	0.0	YES
12,500	109.7 dB	109.9	110.3dB	-0.1	YES
16,000	109.7 dB	109.9	110.3dB	-0.1	YES
20,000	109.7 dB	109.8	110.3dB	-0.2	YES

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Certificate of Compliance and Calibration

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL-1/3 Sound Level Meter Type-2
Serial No.: BIJ090010, w/Microphone QE7052 SN: No38771, Pre-Amp SN: 0910 4962
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

Peak Parameter Electrical Check	ANSI S1.4 Lower Tolerance	Actual Value	ANSI S1.4 Upper Tolerance	Compliance
Peak-C Response 110.0 dB - 31.5Hz	109.5	**113.1**	115.5	YES
Peak-C Response 110.0 dB - 500Hz	111.5	**113.9**	115.5	YES
Peak-C Response 110.0 dB - 8000Hz	110.4	**114.7**	116.4	YES

Broadband Noise Floor Check	Test Result (dB)	Upper Limit (dB)	Compliance
A-weight Noise Floor	**17.4**	22.0	Yes
C-weight Noise Floor	**16.0**	30.0	Yes
Z-weight Noise Floor	**18.8**	35.0	Yes
F-weight Noise Floor	**20.3**	40.0	Yes

Laboratory Conditions during Calibration

Atmospheric Pressure	**827.3 hPa**
Laboratory Air Temperature	**22.4 Deg. C**
Laboratory Air Humidity	**26.2 %**

Standards Used and Their Due Dates:

Measuring Amp	**B&K 2636**	**SN: 812847**	**Trace # CAS-355090-C1T2Z7-101**	**Due Date: 01/16/2021**
Piston Phone	**B&K 4228**	**SN: 1747024**	**Trace # CAS-355090-C1T2Z7-802**	**Due Date: 01/16/2021**
Calibrator	**B&K 4231**	**SN: 2122969**	**Trace # CAS-355090-C1T2Z7-801**	**Due Date: 01/16/2021**
Multimeter	**HP**	**SN: US36054035**	**Trace # 1-10796763933-1**	**Due Date: 01/14/2021**

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Certificate of Compliance and Calibration

Calibrated for:

Mr. Graham Stephens
Sespe Consulting, Inc.
1565 Hotel Circle South
Suite 370
San Diego, CA 92108

Client#S-100
EDI Job#CR6035-2
ID# 103

Calibration Conclusion	
As Received:In Tolerance	☒
As Received:Out of Tolerance	☐
As Left: In Tolerance	☒
As Left: Out of Tolerance	☐

Manufacturer: Quest Technologies
Model Number: QC-10 Class-1 Acoustic Calibrator
Serial No.: QIJ090052
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

As-Received Pre-Calibration Values: IN-TOLERANCE

	ANSI S1.40 Lower Tolerance	Actual Value	ANSI S1.40 Upper Tolerance	Compliance
Sound pressure Level, dB	113.45	**113.8**	114.55	YES
Acoustic frequency, Hz	980	**1006.2**	1020	YES
1 VAC Output Voltage	NA	**1.000**	NA	NA
1 VAC Output Frequency Hz	NA	**1006.2**	NA	NA

Post-Calibration Values: IN-TOLERANCE

	ANSI S1.40 Lower Tolerance	Actual Value	ANSI S1.40 Upper Tolerance	Compliance
Sound pressure Level, dB	113.45	**114.0**	114.55	YES
Acoustic frequency, Hz	980	**1006.2**	1020	YES
1 VAC Output Voltage	NA	**1.000**	NA	NA
1 VAC Output Frequency Hz	NA	**1006.2**	NA	NA

Laboratory Conditions during Calibration

Atmospheric Pressure	**827.1 hPa**
Laboratory Air Temperature	**22.7 Deg. C**
Laboratory Air Humidity	**25.4 %**

Standards Used and Their Due Dates:

Measuring Amp	**B&K 2636**	**SN: 812847**	**Trace# CAS-355090-C1T2Z7-101**	**Due Date: 01/16/2021**
Piston Phone	**B&K 4228**	**SN: 1747024**	**Trace# CAS-355090-C1T2Z7-802**	**Due Date: 01/16/2021**
Calibrator	**B&K4231**	**SN: 2122969**	**Trace# CAS-355090-C1T2Z7-801**	**Due Date: 01/16/2021**
Multimeter	**KS 34461A**	**SN: MY59002241**	**Trace# 34461AMY59002241**	**Due Date: 05/11/2020**

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Certificate of Compliance and Calibration

Calibrated for:

Mr. Graham Stephens
Sespe Consulting, Inc.
1565 Hotel Circle South
Suite 370
San Diego, CA 92108

Client#S-100
EDI Job#CR6035-3
ID# 103

Calibration Conclusion	
As Received:In Tolerance	☒
As Received:Out of Tolerance	☐
As Left: In Tolerance	☒
As Left: Out of Tolerance	☐

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL Sound Level Meter Type-2
Serial No.: BGI040008, w/Microphone QE7052 SN: No35272, Pre-Amp SN: 0509 3379
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

As-Received Pre-Calibration Values: IN-TOLERANCE	ANSI S1.4 Lower Talerance	Actual Value	ANSI S1.4 Upper Tolerance	Compliance
Sound Pressure Level,114.0dB@1 KHz	113.0	**114.1**	115.0	YES

As-Received Pre-Calibration Values: IN-TOLERANCE	ANSI S1.4 Lower Tolerance	Actual Value	ANSI S1.4 Upper Tolerance	Compliance
Sound Pressure Level,114.0dB@1 KHz	113.0	**114.0**	115.0	YES

Acoustical Parameter Check (110 dB input)	ANSI S1.4 Lower Tolerance	Actual Value	ANSI S1.4 Upper Tolerance	Compliance
Fast Response dB	107.0	**109.0**	110.0	YES
Slow Rasponse dB	103.9	**105.9**	107.9	YES
Crest Factor dB	109.5	**110.0**	110.5	YES
Peak Response	112.5	**113.0**	113.5	YES
Impulse Response	109.5	**110.0**	110.5	YES

Linearity Check	dB Input Level at 1000 Hz							
	130.0 dB	120.0 dB	110.0 dB	100.0 dB	90.0 dB	80.0 dB	70.0 dB	60.0 dB
Linearity Tolerance ±0.5 dB	130.0	120.0	110.0	100.0	90.0	80.0	69.9	59.9
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Electrical Linearity Check	dB Input Level at 1000 Hz				
	70.0 dB	60.0 dB	50.0 dB	40.0 dB	30.0 dB
Linearity Tolerance ±0.6 dB	70.0	60.0	49.9	40.0	30.2
Compliance	Yes	Yes	Yes	Yes	Yes

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Certificate of Compliance and Calibration

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL Sound Level Meter Type-2
Serial No.: BGI040008, w/Microphone QE7052 SN: No35272, Pre-Amp SN: 0509 3379
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

Range Check (at 1000Hz)	100.0dB Input Level at 1000 Hz				
	140-70 dB	130-40 dB	120-30 dB	110-20 dB	100-10 dB
Range Tolerance ±0.6 dB	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Compliance	Yes	Yes	Yes	Yes	Yes

Range Check	70.0dB Input Level at 1000Hz		
	90 to 0 dB	80 to -10 dB	70 to -20 dB
Range Tolerance ±0.6 dB	**70.0**	**70.0**	**70.1**
Compliance	Yes	Yes	Yes

Broadband Noise Floor Check	Test Result (dB)	Upper Limit (dB)	Compliance
A-weight Noise Floor	**16.5**	22.0	Yes
C-weight Noise Floor	**15.3**	30.0	Yes
Z-weight Noise Floor	**17.8**	35.0	Yes
F-weight Noise Floor	**19.4**	40.0	Yes

A-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	46.5	**49.9**	52.5	-50.5	± 3	Yes
31.5	57.6	**60.6**	61.5	-39.4	± 3	Yes
63	71.8	**73.8**	75.8	-26.2	± 2	Yes
125	82.4	**83.8**	85.4	-16.1	± 1.5	Yes
250	89.9	**91.2**	92.9	-8.6	± 1.5	Yes
500	95.3	**96.7**	98.3	-3.2	± 1.5	Yes
1K REF.	98.5	**100.0**	101.5	0	± 1.5	Yes
2K	99.2	**101.3**	103.2	1.2	± 2	Yes
4K	98.0	**101.5**	104.0	1	± 3	Yes
8K	93.9	**96.5**	103.9	-1.1	± 5	Yes
16K	---	**90.1**	98.4	-6.6	+5/-∞	Yes

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Certificate of Compliance and Calibration

Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL Sound Level Meter Type-2
Serial No.: BGI040008, w/Microphone QE7052 SN: No35272, Pre-Amp SN: 0509 3379
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

C-weighted Frequency Response with 100 dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	90.8	**93.9**	96.8	-3.0	± 3	Yes
31.5	94.0	**97.2**	100.0	-3.0	± 3	Yes
63	97.2	**99.2**	101.2	-0.8	± 2	Yes
125	98.3	**99.7**	101.3	-0.2	± 1.5	Yes
250	98.5	**99.9**	101.5	0.0	± 1.5	Yes
500	98.5	**99.9**	101.5	0.0	± 1.5	Yes
1K REF.	98.5	**99.9**	101.5	0.0	± 1.5	Yes
2K	97.8	**99.8**	101.8	-0.2	± 2	Yes
4K	96.2	**99.6**	102.2	-0.8	± 3	Yes
8K	92.0	**94.6**	102.0	-3.0	± 5	Yes
16K	---	**87.9**	96.5	-8.5	+5/-∞	Yes

Z-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	97.0	99.2	103.0	0.0	± 3	Yes
31.5	97.0	99.6	103.0	0.0	± 3	Yes
63	98.0	99.8	102.0	0.0	± 2	Yes
125	98.5	99.9	101.5	0.0	± 1.5	Yes
250	98.5	99.9	101.5	0.0	± 1.5	Yes
500	98.5	99.8	101.5	0.0	± 1.5	Yes
1K REF.	98.5	99.9	101.5	0.0	± 1.5	Yes
2K	98.0	99.9	102.0	0.0	± 2	Yes
4K	97.0	100.2	103.0	0.0	± 3	Yes
8K	95.0	96.8	105.0	0.0	± 5	Yes
16K	---	94.1	105.0	0.0	+5/-∞	Yes

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Manufacturer: 3M/Quest Technologies
Model Number: SoundPro DL Sound Level Meter Type-2
Serial No.: BGI040008, w/Microphone QE7052 SN: No35272, Pre-Amp SN: 0509 3379
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

Flat-weighted Frequency Response with 100.0dB Input						
Frequency (Hz)	Min. dB	Response Level dB	Max. dB	Relative Response Level dB	Tolerance Limit dB	Compliance
20	97.0	99.9	103.0	0.0	± 3	Yes
31.5	97.0	**99.9**	103.0	0.0	± 3	Yes
63	98.0	**99.9**	102.0	0.0	± 2	Yes
125	98.5	**99.9**	101.5	0.0	± 1.5	Yes
250	98.5	**99.9**	101.5	0.0	± 1.5	Yes
500	98.5	**99.9**	101.5	0.0	± 1.5	Yes
1K REF.	98.5	**99.9**	101.5	0.0	± 1.5	Yes
2K	98.0	**99.9**	102.0	0.0	± 2	Yes
4K	97.0	**100.4**	103.0	0.0	± 3	Yes
8K	95.0	**97.3**	105.0	0.0	± 5	Yes
16K	---	**96.2**	105.0	0.0	+5/-∞	Yes

Laboratory Conditions during Calibration

Atmospheric Pressure	**827.5 hPa**
Laboratory Air Temperature	**22.2 Deg. C**
Laboratory Air Humidity	**25.4 %**

Standards Used and Their Due Dates:

Measuring Amp	**B&K 2636**	**SN: 812847**	**Trace # CAS-355090-C1T2Z7-101**	**Due Date: 01/16/2021**
Piston Phone	**B&K 4228**	**SN: 1747024**	**Trace # CAS-355090-C1T2Z7-802**	**Due Date: 01/16/2021**
Calibrator	**B&K 4231**	**SN: 2122969**	**Trace # CAS-355090-C1T2Z7-801**	**Due Date: 01/16/2021**
Multimeter	**HP**	**SN: US36054035**	**Trace # 1-10796763933-1**	**Due Date: 01/14/2021**

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Certificate of Compliance and Calibration

Calibrated for:

Mr. Graham Stephens
Sespe Consulting, Inc.
1565 Hotel Circle South
Suite 370
San Diego, CA 92108

Client#S-100
EDI Job#CR6035-4
ID# 103

Calibration Conclusion	
As Received:In Tolerance	☒
As Received:Out of Tolerance	☐
As Left: In Tolerance	☒
As Left: Out of Tolerance	☐

Manufacturer: Quest Technologies
Model Number: QC-10 Class-1 Acoustic Calibrator
Serial No.: QIB070141
Calibration Date: 26-Mar-2020
Calibration Due Date: 26-Mar-2021
Calibrated By: John R. Johnson

As-Received Pre-Calibration Values: IN-TOLERANCE

	ANSI S1.40 Lower Tolerance	Actual Value	ANSI S1.40 Upper Tolerance	Compliance
Sound pressure Level, dB	113.45	**114.0**	114.55	YES
Acoustic frequency, Hz	980	**1004.6**	1020	YES
1 VAC Output Voltage	NA	**1.001**	NA	NA
1 VAC Output Frequency Hz	NA	**1004.6**	NA	NA

Post-Calibration Values: IN-TOLERANCE

	ANSI S1.40 Lower Tolerance	Actual Value	ANSI S1.40 Upper Tolerance	Compliance
Sound pressure Level, dB	113.45	**114.0**	114.55	YES
Acoustic frequency, Hz	980	**1004.6**	1020	YES
1 VAC Output Voltage	NA	**1.001**	NA	NA
1 VAC Output Frequency Hz	NA	**1004.6**	NA	NA

Laboratory Conditions during Calibration

Atmospheric Pressure	**826.8 hPa**
Laboratory Air Temperature	**22.6 Deg. C**
Laboratory Air Humidity	**25.7 %**

Standards Used and Their Due Dates:

Measuring Amp	**B&K 2636**	**SN: 812847**	**Trace# CAS-355090-C1T2Z7-101**	**Due Date: 01/16/2021**
Piston Phone	**B&K 4228**	**SN: 1747024**	**Trace# CAS-355090-C1T2Z7-802**	**Due Date: 01/16/2021**
Calibrator	**B&K4231**	**SN: 2122969**	**Trace# CAS-355090-C1T2Z7-801**	**Due Date: 01/16/2021**
Multimeter	**KS 34461A**	**SN: MY59002241**	**Trace# 34461AMY59002241**	**Due Date: 05/11/2020**

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APPENDIX I

Traffic/Transportation

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APPENDIX I-1

Traffic Impact Analysis Memorandum
(ATE, 2021)

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ASSOCIATED TRANSPORTATION ENGINEERS

100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805)687-4418 • main@atesb.com

Since 1978

Richard L. Pool, P.E.
Scott A. Schell

November 4, 2021

20065L01

Graham Stephens
Sespe Consulting Inc.
374 Poli Street, Suite 200
Ventura, California 93001

TRAFFIC ANALYSIS
FOR THE McKAY POINT RESERVOIR PROJECT, TULARE COUNTY, CALIFORNIA

Associated Transportation Engineers (ATE) has prepared the following traffic analysis for the McKay Point Reservoir Project, located in Tulare County, California. The Project site lies south of both Lake Kaweah and Bravo Lake; 1-mile northwest of the community of Lemon Cove and 2.5 miles southeast of the community of Woodlake.

PROJECT DESCRIPTION

The Project includes the excavation, construction and operation of the McKay Point reservoir. The reservoir would serve as a surface water storage/re-regulation reservoir and also to optimize groundwater recharge within the Owners service areas.

West Coast Aggregate (WCA) will excavate the pit required to construct the reservoir in accordance with the Surface Mining and Reclamation Act (SMARA) requirements for surface mining operations. The excavated material will be transported by either a conveyor system or by haul trucks/heavy equipment to the on-site processing plant. Aggregate mining and processing operations have been conducted at the Seaborn site since 1976. The Seaborn site is adjacent to the western boundary of the Project site. The Seaborn site was purchased by the Tulare Irrigation District (TID) in order to gain the necessary ingress and egress needed to excavate the pit for the reservoir. The Project excavation activities would be designed to produce less or not greater than the historical annual maximum production levels (baseline) recorded for the Seaborn operation. Therefore, the Project would not generate new off-site traffic (no increase in baseline on-road truck trips) impacts associated with the processing of the aggregate or the transport of the material to market.

PROJECT-SPECIFIC IMPACT ANALYSIS

The following section evaluates the average daily trips (ADT), AM and PM project-specific impacts related to each phase of McKay Point Reservoir Project compared to the Seaborn site baseline trip generation.

Project Trip Generation

- *Excavation:* During the excavation phase, conservatively it is estimated that 7 to 12 employees would be on-site. The excavation of aggregate could occur between the hours of 4:00 AM and 6:00 PM Monday through Saturday. Excavated material would be processed onsite, using a processing/wash plant and portable crushing/recycle plant. Finished products would be delivered directly from the Project site by WCA, using the existing access road that travels through the adjacent Seaborn site connecting to Road 222 to the west. WCA will transport the processed aggregate to customers via on-road trucks. These employee trips and on-road truck trips would not exceed the baseline activities for the Seaborn site.

- *Construction:* During the construction phase, conservatively it is estimated that 7 to 12 employees would be on-site. The construction activities could occur between the hours of 4:00 AM and 6:00 PM Monday through Saturday. Construction material and equipment would be transported to and from the site by on-road trucks. The employee trips and on-road truck trips during the construction phase would not exceed the baseline activities associated with the Seaborn site. In reality, on average employee and on-road truck trips would be far less than those historically associated with the Seaborn site.

- *Daily Operation:* Operations of the reservoir will primarily be conducted remotely. There will not be employees on-site on a routine basis. Assuming 1-2 daily employees is being conservative since the operation will be controlled remotely from the TID office with only the occasional need for employees on-site for maintenance and inspection reasons.

Table 1
McKay Point Reservoir Project Trip Generation

Development Phase	Number	ADT	AM Peak Hour			PM Peak Hour		
			Trips	Entering	Exiting	Trips	Entering	Exiting
Seaborn Baseline:								
- Employees	12	24	0	0	0	0	0	0
- Truck Loads	160	320	20	10	10	20	10	10
Seaborn Baseline Trip Generation:		344	20	10	10	20	10	10
Excavation:								
- Employees	12	24	0	0	0	0	0	0
- Trucks Loads	160	320	20	10	10	20	10	!0
Excavation Phase Trip Generation:		344	0	10	10	20	10	10
Construction:								
- Employees	12	24	0	0	0	0	0	0
- Truck Loads	160	320	20	10	10	20	10	10
Construction Phase Trip Generation:		344	20	10	10	20	10	10
Daily Operation:								
- Employees	2	4	0	0	0	0	0	0

According to the McKay Point Reservoir Project description, during the excavation phase the Project generates up to 344 daily trips, with up to 20 AM peak hour trips and 20 PM peak hour trips. These Project excavation trips do not exceed the baseline for the Seaborn site. The construction phase of the Project is also anticipated to generate up to 344 daily trips, with up to 20 AM peak hour trips and 20 PM peak hour trips. Neither the Project excavation trips, nor the construction trips exceed the baseline on-road vehicle trips for the Seaborn site. During the daily operational phase, the reservoir will primarily be controlled and operated remotely from the TID office with only the occasional need for employees on-site for maintenance and inspection reasons. Therefore, there will not be employees on-site on a routine basis. Worst-case assuming 1 - 2 daily employees, the Project generates 4 daily trips, with 0 AM peak hour trips and 0 PM peak hour trips. Based on information provided by the applicant, these Project excavation, construction and operational phase on-road vehicle trips do not exceed baseline levels for the Seaborn site. These employee and truck trips are used to determine Project specific traffic impacts.

SUMMARY

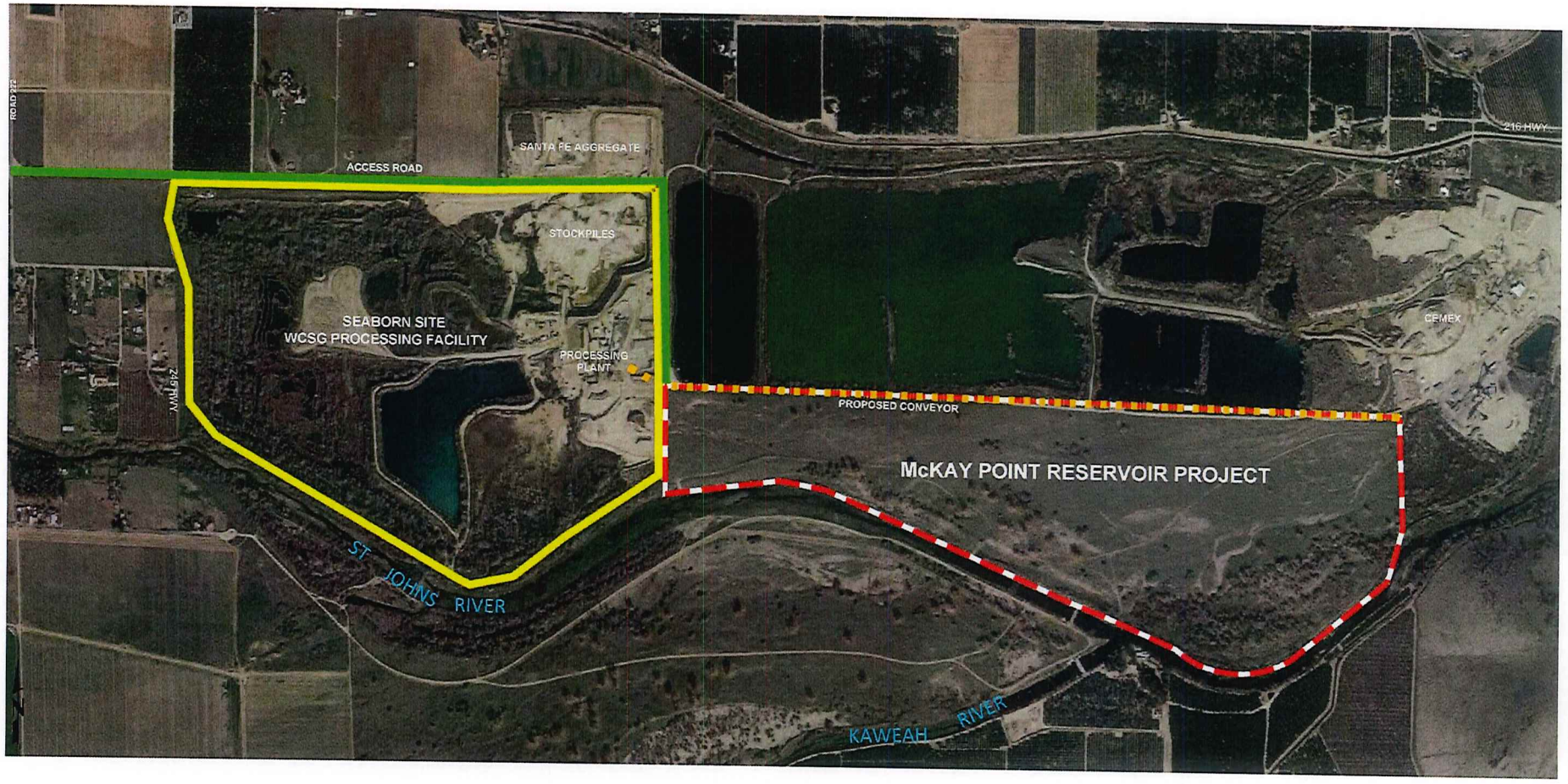
The McKay Point Reservoir Project is not expected to generate significant traffic impacts. The project-generated traffic volumes would be consistent with the existing Seaborn baseline scenario.

Associated Transportation Engineers



By: Richard L. Pool, P.E.
President

RLP/DFN
Attachment: - Site Plan



N
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TRANSPORTATION
ENGINEERS

PROJECT SITE PLAN

FIGURE 1

GM- ATE#20065

APPENDIX I-2

Transportation and Vehicle Miles Travelled (VMT) Analysis
(Sespe Consulting, Inc., 2022)

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SESPE
CONSULTING, INC.
A Trinity Consultants Company
374 Poli Street, Suite 200 • Ventura, CA 93001
Phone: (805) 275-1515 • Fax: (805) 677-8104

July 26, 2022

Mr. Aaron Fukuda
Tulare Irrigation District
6826 Avenue 240
Tulare, California 93274

Subject: Transportation and Vehicle Miles Travelled (VMT) Analysis – McKay Point Reservoir Project

Dear Mr. Fukuda,

This letter is in response to the County of Tulare's (County's) request for a Vehicle Miles Traveled (VMT) analysis, as required by the County Planning Department, for the proposed surface water storage and re-regulation reservoir located on the north side of the divergence of the Lower Kaweah River and St. Johns River. The Tulare Irrigation District (TID), the Consolidated Peoples Ditch Company (CPDC) and the Visalia & Kaweah Water Company (VKWC) are joint owners (Owners) of approximately 500 acres of land adjacent to the Lower Kaweah River and St. Johns River in Tulare County, California, commonly referred to as the McKay Point property. The Owners propose to construct and operate the McKay Point Reservoir on the property (Project). The construction and operation of this reservoir is the Project under review.

The Project would consist of the following phases: excavation of the site for the reservoir; construction of the reservoir; and operation of the reservoir. The Owners would contract with West Coast Aggregate Supply, Inc. (WCA) to excavate the site to allow for the construction of the reservoir. After the excavation and construction of the reservoir, the McKay Point Reservoir would be used as a surface water storage/re-regulation reservoir. The reservoir would also be used to optimize groundwater recharge within the Owners service areas.

Background

The Project site is located in Tulare County, and lies between and to the south of both Lake Kaweah (2.5 miles northeast of the site) and Bravo Lake (1.5 miles northwest of the site); 1.0 miles northwest of the community of Lemon Cove; and 2.5 miles southeast of the community of Woodlake. The Project site is located approximately 1.0 mile west-southwest of the intersection of State Highways 216 and 198.

Historically, the Project site has been used for cattle grazing under lease arrangements. The CEMEX Lemon Cove aggregate facility is immediately to the north, and their Stillwell Aggregate Mine is approximately 1.0 miles to the northeast of the Project site. The Kaweah River Rock aggregate mining and processing facility is located immediately to the west on the Seaborn site, and the Kaweah South Project lies approximately 1.0 mile to the southwest of the Project site.

Excavated and processed materials would be loaded directly on to on-road haul trucks within the Project site. Once loaded, the on-road haul trucks would exit the Project site via the privately owned access road on the

Seaborn site (owned by TID and CPDC) which connects to Road 222. From there the material would be transported to WCA's customers via public roads. The number of on-road haul trucks on public roads associated with WCA's sale of the processed material would not increase from the baseline level of on-road truck traffic (160 trips per day) leaving from TID's access road. The number of on-road haul trucks carrying the processed aggregate as well as the number of on-road trucks needed for the transport of other materials (recycled concrete and asphalt, excess fines, blending materials) being exported or imported to or from the site would not be allowed to exceed the baseline production rate from the previous operations at the Seaborn site (average of 500,000 tons per year [TPY] and a maximum of 650,000 TPY).

The excavation phase of the Project would require only 7 to 12 onsite employees. This would be consistent with the baseline number of employees previously required during the mining and processing activities at the Seaborn site. For evaluation purposes, it is assumed that each employee would make 2 trips per day (inbound and outbound). This would result in a maximum of 24 trips on peak days, assuming all 12 employees are onsite as compared to the 35 employee trips per day during mining and processing activities at the Seaborn site. As a result, the Project would generate only nominal traffic on public roadways, which would not result in a significant increase from baseline operations at the Seaborn site.

Access for employees and service vehicles would be via Road 222 through the Seaborn site to the entrance to the Project site. Note that a single-way trip is referred to as a "trip" and a round trip (going from the WCA facility to their customers and the return trip by the on-road truck back to the facility) is referred to as a "load" (two one-way trips).

Truck Traffic

The California Office of Planning and Research's (OPR's) guidance and Section 15064.3 of the California Environmental Quality Act (CEQA) Guidelines states that "…'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project. Neither the Technical Advisory nor CEQA Guidelines Section 15064.3(a) directly address how to analyze transportation impacts associated with changes to goods movement, which is largely carried out by heavy-duty trucks. CEQA Guidelines Section 15064.3(a) specifies that VMT to be analyzed is defined as the amount and distance of *automobile travel* (emphasis added) attributable to a project. The term 'automobile' refers to on-road *passenger vehicles, specifically cars and light trucks* (emphasis added).[1] Senate Bill (SB) 743 is not intended to require the inclusion of heavy-duty truck trips, utility vehicles, or other types of vehicles in the VMT analysis.[2] In the case of trucks (other than light trucks), based on CARB's 2017 Scoping Plan, the State's strategy for the goods movement sector is not in VMT reduction, but in advances in technology [zero-emissions (ZE) and near-zero emissions (NZE) control strategies].[3]

Additionally, as discussed above, because the production rate of marketable aggregate would not increase from baseline, the number of on-road haul trucks transporting product offsite on public roadways would also not be

[1] Governor's Office of Planning and Research, December 2018, Technical Advisory on Evaluating Transportation Impacts Under CEQA, https://www.opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed January 10, 2021.
[2] South Coast coordinated with staff at OPR on January 12, 2021 to confirm how to address heavy-duty freight VMT in CEQA documents. OPR staff identified that the intent of SB 743 was to address passenger vehicle VMT impact and not freight VMT, as cited under CEQA Guidelines Section 15064.3(a). Therefore, lead agencies could exclude freight VMT from transportation VMT impact analyses under CEQA.
[3] California Air Resources Board, 2017, California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target, https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf, accessed on March 18, 2019.

increased above existing levels. The Project operations (excavation of the site, construction of the reservoir and reservoir operations) would be managed such that the number of on-road haul trucks, delivery trucks and/or service vehicles would not result in an increase to the baseline. For these reasons, heavy-duty trucks have been excluded from the Project's VMT evaluation.

Vehicle Miles Travelled (VMT) Evaluation

Guidelines for assessing the Project's VMT as part of a transportation impact analysis under CEQA are contained in the "County of Tulare SB 743 Guidelines," dated June 8, 2020. The advisory contains recommendations regarding VMT assessment, significance thresholds and mitigation measures. Under CEQA, lead agencies have the authority to establish their own VMT significance thresholds and analysis methodologies or rely on thresholds and methodologies recommended by other agencies, provided such guidelines are supported by substantial evidence.

The Tulare County advisory provides "screening thresholds" for identifying whether a land use project should be expected to result in a less than significant transportation impact under CEQA. Projects meeting one or more of these criteria would not be required to undergo a detailed VMT analysis. One of the screening thresholds is described as "Small Projects". Small projects are presumed to have a less than significant transportation impact. The County guidelines define a small project to be a project that generates less than 500 trips per day.

The proposed Project would fall within the small project category since the Project is expected to generate 24 daily trips on peak days, which is less than the 500-trip threshold. Therefore, the project would "screen out", and be expected to have less than significant transportation impacts.

In addition, the number of employees required at the site would be less than baseline, thus reducing the number of employee vehicles on public roads. The distance/daily VMTs to and from the site to deliver product to WCA's customers in the region would also not significantly change from the VMT associated with the existing Seaborn operations. Therefore, the Project would not interfere with transportation or result in an increase of local traffic. The routine operation of the reservoir would be conducted remotely from TIDs offsite office and would not result in a significant increase in TID employees.

Please contact me, Maya Rohr, or John Hecht at (805) 275-1515 if you have any questions or require additional information.

Kind regards,



Graham Stephens
Sespe Consulting, Inc.

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