INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION
Seeley County Water District Wastewater Treatment Plant Improvements
April 2026

Prepared for
Seeley County Water District
1898 W Main Street
Seeley, California 92273

Prepared By:

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Appendices

Appendix A – CalEEMod, 2020.4.0 Air Quality and GHG Modeling Results
Appendix B – Geotechnical Investigation Report (2021 and 2026)

Acronym List

Abbreviation	Definition
ACS	American Community Survey
AFC	Application for Certification
ASTM	American Society for Testing and Materials
AQAP	Air Quality Attainment Plan
AQMP	Air Quality Management Plan
BLM	Bureau of Land Management
BOD5	Biochemical Oxygen Demand
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire
CARB	California Air Resources Board
CBC	California Building Code
CEC	California Energy Commission
CERS	California Environmental Reporting System
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CIWQS	California Integrated Water Quality System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CSDA	California Special District Association
dBA	decibel
DWSRF	Drinking Water State Revolving Fund
E.coli	Escherichia Coli
EDR	Environmental Data Resources
EIR	Environmental Impact Report
FEMA	Federal Emergency Management
FINDS	Facility Index System Database
FRAP	Fire and Resource Assessment Program
GHG	greenhouse gases
ICAPCD	Imperial County Air Pollution Control District
IID	Imperial Irrigation District
IPaC	Information for Planning and Consultation
IS/MND	Initial Study / Mitigated Negative Declaration
LAFCO	Local Agency Formation Commission
LOS	Level of Service
LRA	Local Responsibility Area
MBR	Membrane Bio-Reactor
MGD	Million Gallons per Day

Abbreviation	Definition
MLD	Most Likely Descendant
MMPs	Mandatory Minimum Penalties
MS4s	Municipal Separate Storm Sewer Systems
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NO2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
O3	ozone
OSHA	Occupational Safety and Health Administration
PM10	particulate matter (less than 10 microns)
PM2.5	particulate matter (less than 2.5 microns)
QSD	Qualified SWPPP Developer
ROG	Reactive Organic Gases
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SCIC	South Coastal Information Center
SCWD	Seeley County Water District
SDSU	San Diego State University
SIP	State Implementation Plan
SO2	Sulfur Dioxide
SRF	State Clean Water Revolving Fund
SSAB	Salton Sea Air Basin
SU	Single Unit
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWWRF	Seeley Wastewater Reclamation Facility
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UV	Ultraviolet
VHFHSZ	Very High Fire Hazard Severity Zone
VOC	Volatile Organic Compound
VRI	Visual Resource Inventory
WAS	Waste Activated Sludge
WDR	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

Project Title:	Seeley County Water District Wastewater Treatment Plant Improvements
Lead Agency Name and Address:	Seeley County Water District 1898 W Main Street Seeley, CA 92273
Contact Person and Phone Number:	Miriam Rosales, Administrative General Manager and Secretary of the Board, Seeley County Water District, 1898 W. Main Street, PO Box 161, Seeley, CA 92273 (760)-352-6612 mrosales@seeleywaterdistrict.com Katie Hoek Hazen and Sawyer (212) 539-7248 khoek@hazenandsawyer.com Gregg Cummings Hazen and Sawyer (628) 242-0050 gcummings@hazenandsayer.com
Project Location:	Figure 1-1 shows the location of the Seeley County Water District Wastewater Treatment Plant (WWTP) where the proposed WWTP improvements will be located. The WWTP is located within the Seeley in Imperial County, at 1898 W. Main Street.
Project Sponsor's Name and Address:	Seeley County Water District 1898 W Main Street Seeley, CA 92273
General Plan / Zoning Designation(s):	GS, S-2 (Government/Special Use)
Date Prepared:	April 2026

1.1 Overview

Seeley County Water District (SCWD) proposes to undertake improvements to its existing Wastewater Treatment Plant (WWTP) located in Seeley California to address violations of the facility's National Pollutant Discharge Elimination System (NPDES) permit for effluent discharged from the WWTP to the New River. When completed, the SCWD WWTP Improvements Project (project) is anticipated to resolve recent effluent violations and allow the WWTP to adjust operations to accommodate future changes in effluent limits.

An agreement (Fiscal Agreement SWRCB D1901022) was executed between the District and the California State Water Resources Control Board (SWRCB) on August 5, 2020, to provide SCWD with a Clean Water Small Community Planning Loan from the State Clean Water Revolving Fund to help implement the project. The loan carries certain compliance requirements, including review of the project in accordance with the California Environmental Quality Act (CEQA). The Agreement was amended via Amendment 1 on September 24, 2025.

This Initial Study analyzes potential environmental impacts associated with the proposed project in accordance with CEQA. Chapter 2 of this study provides a detailed description of the proposed project. An evaluation of potential impacts of the proposed project is presented in Chapter 3.

1.2 Project Location

The proposed project is located at the SCWD's WWTP located at 1898 West Main Street in Seeley, Imperial County, California as shown in Figure 1-1. The boundary of the SCWD service area is shown in Figure 1-2**.**



Figure 1-1: Seeley Location Map

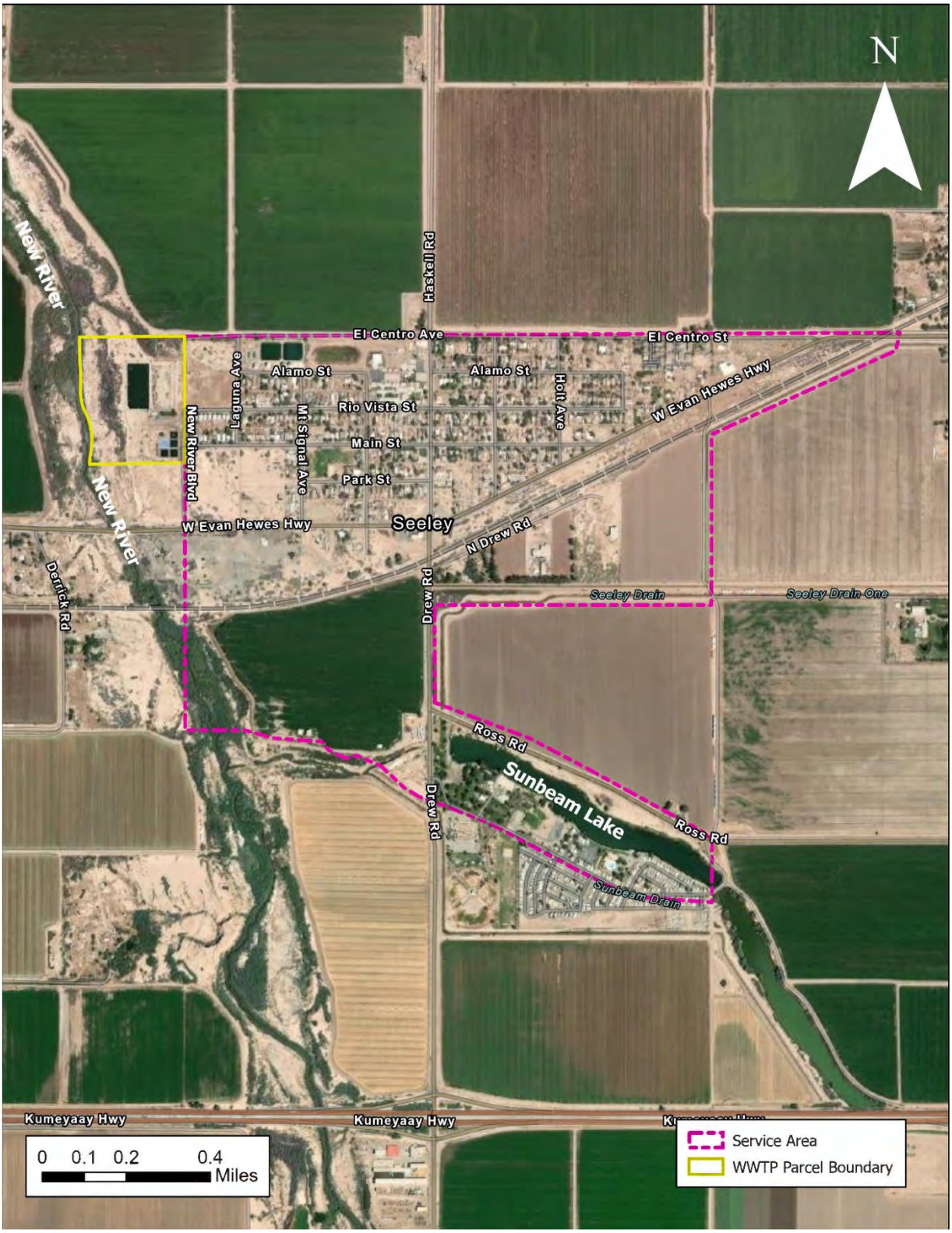


Figure 1-2: WWTP Site Location and SCWD Service Area Boundary Map

1.3 Authority

SCWD is the lead agency for the proposed project. SCWD undertook a review of the proposed project, and determined that it is a project, as defined by CEQA. SCWD further determined that the project has the potential to impact the environment, and that an Initial Study should be prepared. This Initial Study has been prepared in accordance with CEQA, Public Resources Code Section 21000 et. seq. Based on the findings contained in this document a Mitigated Negative Declaration is proposed.

1.4 Scope of Environmental Review

Consistent with the requirements of CEQA, this Initial Study addresses the required topicscontained in Appendix G, Environmental Checklist of the CEQA Guidelines, as follows:

- Aesthetics
- Biological Resources
- Geology/Soils
- Hydrology/Water Quality
- Noise
- Recreation
- Utilities / Service Systems
- Agriculture / Forestry Resources
- Cultural Resources
- Greenhouse Gas Emissions
- Land Use / Planning
- Population / Housing
- Transportation
- Wildfire
- Air Quality
- Energy
- Hazards & Hazardous Materials
- Mineral Resources
- Public Services
- Tribal Cultural Resources
- Mandatory Findings of Significance

1.4.1 CEQA-Plus Requirement

The project is financed by a State of California Clean Water Small Community Planning Loan from the State Clean Water Revolving Fund (SRF), with 100% principal forgiveness administered by the SWRCB, Division of Financial Assistance. The DWSRF program is partially funded by the U.S. Environmental Protection Agency (USEPA) and is therefore subject to federal environmental review requirements. All applicants seeking DWSRF financing must comply with CEQA and provide sufficient information so that the SWRCB can document compliance with federal environmental laws. The SWRCB calls this federal compliance "CEQA-Plus." This Initial Study has been prepared to address CEQA-Plus requirements to be eligible for DWSRF loan funds. These requirements include documentation of compliance with applicable federal cross-cutting regulations, including the Endangered Species Act, Bald and Golden Eagle Protection Act, Clean Air Act, Coastal Barriers Resource Act, Coastal Zone Management Act, Environmental Justice, Farmland Protection Policy Act, Floodplain Management, Archaeological and Historic Preservation Act, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, National Historic Preservation Act/Historic Sites Act, Protection of Wetlands/Clean Water Act (Section 404), Rivers and Harbors Act (Section 10), Safe Drinking Water Act/Sole Source Aquifer Protection, Wild and Scenic Rivers Act, the Wilderness Act, and an evaluation of whether the project is located on any federally managed land.

1.5 Impact Assessment Terminology

The CEQA Guidelines identifies impacts using four levels of significance:

- **No Impact:** When the analysis finds that the project would not affect the environment.
- **Less than significant:** When the analysis finds that a project would not substantially impact the environment and no mitigation is needed to reduce an impact to less than significant levels.
- **Less than significant with mitigation incorporated:** When the analysis finds that a project would result in a substantial impact on the environment, but feasible mitigation measures can be implemented to reduce these impacts to less than significant levels.
- **Potentially Significant:** When the analysis finds that a project would result in a substantial impact on the environment, and no mitigation measures can be feasibly implemented to reduce those impacts to less than significant levels without additional analysis.

1.6 Organization of the Initial Study

This Initial Study has been completed using the following format:

- **Chapter 1 Introduction:** This chapter includes a brief summary of the proposed project and describes the regulatory framework for the preparation of the Initial Study under CEQA.
- **Chapter 2 Project Description:** This chapter includes a comprehensive description of the applicant's proposal, existing conditions, and the general characteristics of the areas surrounding the project site.

- **Chapter 3 Environmental Evaluation:** This chapter contains the analysis of each issue area mandated by the CEQA Guidelines, and includes a discussion of the environmental setting, control measures incorporated into the project, the project's impacts, a determination of the significance of these impacts, and where necessary, mitigation measures.
- **Chapter 4 References:** This chapter identifies the documents used to support preparation of this initial study.

1.7 Documents Incorporated by Reference

In addition to those documents listed in Chapter 4, the Imperial County's General Plan, General Plan EIR and Code of Ordinances were used in the evaluation of the proposed project.These documents are available at the Imperial County Planning & Development Services department website online under its planning section at Regulatory Programs | Imperial County Planning & Development Services (icpds.com)

2. PROJECT DESCRIPTION

2.1 Summary of Existing Facilities

The SCWD provides water and wastewater services to the residents of the community of Seeley, California. The community of Seeley is located in Imperial County near El Centro, and has a total residential population of approximately 2,140, according to SCWD's 2017 Service Area Plan (Figure 1-1 **and** Figure 1-2. SCWD collects and treats wastewater from its 2.26 square-mile service district in Seeley for treatment at its WWTP, located in the northwest portion Seeley just west of the New River at 1898 W. Main Street. The site is primarily accessed from an entry off New River Boulevard at the center of the site. A secondary entrance is located off New River Boulevard at the southeast corner of the site.

As of a 2016 rate study conducted by SCWD, there were 505 residential customer connections, 19 commercial customer connections, and no industrial customer connections to the collection system within the service district, all served directly by the WWTP. The WWTP has also historically treated wastewater received via a septage receiving facility located at the site's New River Boulevard entrance.[1] The existing WWTP is designed for a treatment capacity of 0.25 million gallons per day (MGD) with current average annual daily flows of 0.11 MGD. The WWTP consists of a septage receiving facility, an influent lift station with coarse screen, primary treatment consisting of an aerated pond treatment system that includes pre-aeration and aeration ponds, effluent pumping, secondary treatment that consists of pressure sand filters, and an ultraviolet (UV) disinfection system. SCWD's office building is located onsite, and a portion of the office building is used for operation of the WWTP. The existing site is served by two separate electrical panels and a generator system provides back-up power to the wastewater facilities.

There have been numerous upgrades to the WWTP since its construction in 1965. The facility's current configuration and process flow diagram are shown in Figure 2-1 and Figure 2-2 respectively. The WWTP was originally constructed with two 2.4-acre lagoons (Pond 1 and Pond 2) each with a volumetric capacity of 4,000,000 gallons. These ponds are located in the northwest portion of the site and are used as pre-aeration basins to remove gasses, add oxygen, and promote flotation of grease prior to treatment. The ponds also provide flow equalization (flow balancing) and stabilization of the wastewater to remove biological oxygen demand (BOD) and total suspended solids (TSS). Only one pond is in use at a time under typical operating conditions. In 2014, Pond 2 was retrofitted with a 60-mil high-density polyethylene (HDPE) liner and modified to facilitate sludge removal. After these upgrades, it was brought back in service as the primary aeration pond and Pond 1 was removed from service. Effluent from Ponds 1 / 2 flows to five smaller ponds for aeration (aeration ponds referred to as Clemson Ponds) which were constructed and commenced operation in 2008. These Clemson Ponds are located in the southeast portion of the site along New River Boulevard, have a combined volumetric capacity of approximately 1.1 million gallons and provide oxygen and promote solids settling. Currently, raw wastewater flow

1 Up until 2023 the plant had accepted septage from haulers from Monday to Friday. The majority of the septage delivered to the WWTP is assumed to be residential sewage from local RV resorts and other homes that are located in the surrounding area but not connected to the SCWD's collection system. The septage deliveries were not regulated and entered the WWTP as a pulse of concentrated waste at the time of delivery. The type and number of trucks unloading was unknown on a given day, however, incoming revenue from the summer of 2016 to 2018 suggest the monthly average septage volume was approximately 165,000 gallons. The District may upgrade and reopen the septage receiving station in the future.

(excluding hauled septage) enters the plant from the surrounding collection system that is composed of sanitary sewer gravity pipelines and sanitary sewer force mains. Historically, septage was partially screened and degritted was routed directly into the influent sewer to the WWTP where it is blended with wastewater from the collection system. This combined flow then entered the WWTP's influent lift station, located adjacent to the septage receiving facility, and is lifted with two submersible pumps to the north end of Pond 2. It's anticipated that any future upgraded septage system would be operated in a similar manner.

After between 8 to 20 days, wastewater overflows the south end of Pond 2 into a pipeline and flows to the Clemson ponds via gravity. Flow circulates through the ponds via 6-inch piping which includes valves to bypass any of the ponds if needed. Pond 2 and the Clemson ponds are open to the atmosphere and do not have odor control. Following aeration in the Clemson ponds, the wastewater enters an effluent pump station located adjacent to the northernmost Clemson pond. The effluent pump station pumps wastewater to one or a combination of three pressure sand filters for secondary treatment located just south of Pond 2 and adjacent to the existing office building in the center of the WWTP site. Effluent from the pressure sand filters flows by gravity to the onsite UV Disinfection facility located just to the northeast of the pressure sand filters. This facility was recently upgraded to add a new in-line UV unit. The previous unit is no longer in service due to its age and unavailability of now-obsolete replacement parts. The wastewater is treated with UV light prior to being discharged from the WWTP to a land outfall to the north of Pond 1 and Pond 2. The land outfall transports the treated wastewater effluent to the point of discharge, an unnamed tributary of the New River. The effluent flows approximately 1,000 feet along this unnamed tributary before discharging to the New River. As discussed above, while the permitted flow from the WWTP is 0.25 MGD, the current effluent flow rate is closer to 0.11 MGD and is discharged under Waste Discharge Requirements (WDR) as contained in Order R7-2023-0003 NPDES CA0105023, issued by the Colorado River Basin Colorado River Regional Water Quality Control Board (RWQCB). This permit was issued on June 27, 2023, and expires on July 30, 2028. The permit limits effluent flow to 0.25 MGD. Table 2-1 summarizes the effluent requirements.

Table 2-1 NPDES Effluent Requirements for SCWD's WWTP

Parameter	Units	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Escherichia Coli (E. coli)	MPN/100 ml	126[3]		400[4]		
Enterococci	MPN/100 ml	33[3]		100[4]		
Fecal coliform	MPN/100 ml	200[3]		400[5]		
Flow	mgd	---	---	0.25		
pH	Standard Units	---	---	---	6.0	9.0
Biological Oxygen Demand (BOD_5)	mg/L	45	65	---	---	---
	lbs./day[1]	94	140	---	---	---
Total Suspended Solids (TSS)	mg/L	45	65	---	---	---
	lbs./day[1]	94	140	---	---	---
Oil and Grease, Total[2]	mg/L	---	---	25	---	---
	lbs./day[1]	---	---	52	---	---
Copper, Total Recoverable	µg/L	18.5	---	50.6	---	---
	lbs./day[1]	0.039	---	0.106	---	---
Selenium	µg/L	4.1	---	8.2	---	---
	lbs./day[1]	0.00855	---	0.0171	---	---
Cyanide	µg/L	4.3	---	8.5	---	---
	lbs./day[1]	0.00897	---	0.0177	---	---

1. The mass-based effluent limitations are based on a design capacity of 0.25MGD
2. Total oil and grease shall include the polar and non-polar fraction of oil great materials
3. This effluent limitation is expressed as a geometric (or log) mean, based on a minimum of not less than five equally spaced samples collected for any 30-
   day period
4. This effluent limitation is expressed as a maximum single sample value
5. No more than ten percent of the fecal coliform samples collected during any 30-day period shall exceed a MPN of 400 per 1000 milliliter



Figure 2-1: Existing Site Layout

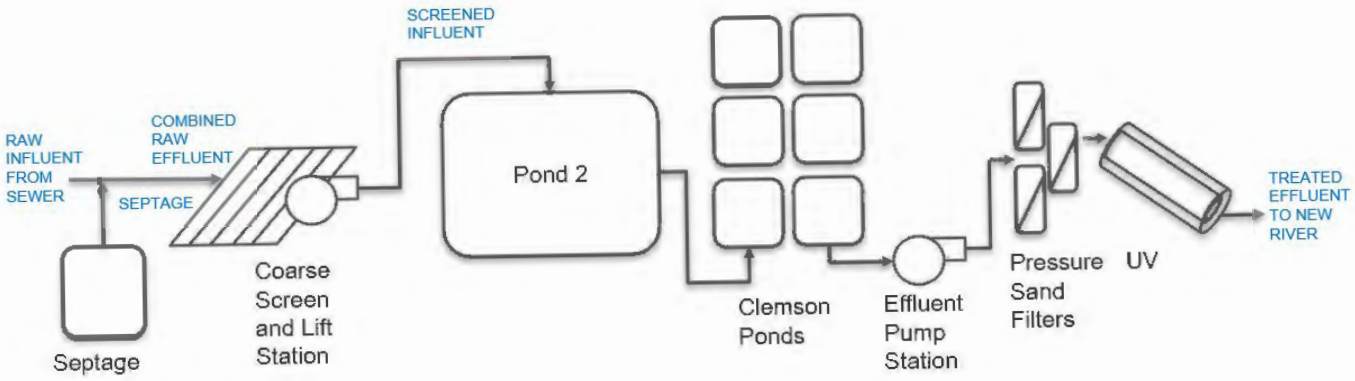


Figure 2-2: Existing Process Flow Diagram

2.2 Project Drivers and Goals

The existing WWTP is in good condition; however, it is incapable of handling the more concentrated wastewater stream that has been created over the years from conservation measures that lower water consumption throughout SCWD's service area. The Colorado River Basin RWQCB issued several notices of noncompliance to SCWD on August 8, 2017, regarding the WWTP's effluent discharge to the New River. The RWQCB identified a failure to comply with the effluent requirements in the WWTP's permit for free cyanide, 5-day biochemical oxygen demand (BOD_5), enterococci, and fecal coliforms during the month of December in 2016. Additionally, the WWTP was reported to have exceeded the limits for BOD_5 during January 2017. The notices of noncompliance include an Administrative Civil Liability Complaint with Mandatory Minimum Penalties (MMPs) for effluent violations and a Time Schedule Order requiring SCWD to submit a schedule of actions that will be used to address effluent discharge violations. In addition to the violations identified by the RWQCB, copper effluent requirements were added to the latest NPDES permit, which was adopted in 2017. Copper violations in the WWTP's effluent were reported when the permit was first adopted, however no copper violations have been reported in recent years.

Since receiving the notices of noncompliance in 2017, SCWD has made operational changes at the WWTP to reduce the likelihood of permit violations. These have included reducing the volume of septage received by the WWTP, improving testing methods to better track pollutants of concern, increasing inspection frequency of the pressure sand filters and UV disinfection system, and discontinuing use of copper sulfate in the aerated ponds that was historically used to control algae growth.

The goal of the project is to improve treatment performance to conform to resolve recent effluent violations and allow the WWTP to adjust operations to accommodate future changes in effluent limits. The project, when completed, is anticipated to resolve the recent effluent violations for free cyanide, BOD_5, enterococci, fecal coliforms, and copper. The proposed upgrades of the WWTP will result in a treated flow capacity of 0.15 MGD, lower than the facility's current design capacity and permitted

effluent flow limit but still capable of accommodating increases in flow associated with future growth in the service area.[2]

2.3 Project Components

To conform to current and future effluent discharge limits, the project primarily consists of upgrading the WWTP's secondary treatment system from a pressure sand filter system to a membrane bioreactor (MBR) system. In addition to installation of an MBR system, the following on-site improvements would be completed:

- Installation of a new Operations Building to house operations, laboratory, and office space.
- Decommissioning of the existing pressure sand filters.
- Conversion of three of the five Clemson Ponds to equalization ponds to provide water level adjustments between periods of peak and low wastewater flows.
- Conversion of the remaining two Clemson Ponds for the capture, storage, and testing of septage deliveries. These ponds may also serve as equalization ponds.
- Installation of additional piping to repurpose the existing effluent pump station. This station currently pumps wastewater from the Clemson Ponds to the pressure sand filters (which would be removed). The repurposed pump station will convey wastewater, as needed, from the Clemson ponds back to Pond 2.
- Installation of a lagoon pump station to take wastewater from Pond 2 directly to the new MBR system.
- Relining of Ponds 1 and 2.
- Construction of sludge drying beds and mechanical dewatering equipment to implement sludge handling operations for sludge generated as part of the MBR process.
- Electrical improvements, including increases to the existing electrical service and addition of 75kW or more of new generator capacity to accommodate the new secondary treatment equipment.
- Addition of a new automatic transfer switch, distribution panel, and direct bury duct banks.
- Installation of a new (upgraded) septage receiving station, including a new septage truck access area, extended berm, revised Clemson Pond piping (for equalization), and a new receiving station with screening and grit removal and storage. This will provide that the WWTP can properly treat and handle the septage waste stream it receives while still complying with SCWD's discharge permit requirements.

The proposed layout of the new facilities and planned WWTP improvements is provided in Figure 2-3.

2.3.1 Membrane Bioreactors for Secondary Treatment

The MBR system would replace the Clemson Ponds and the secondary treatment system currently consisting of pressure sand filters. MBRs are known for producing high quality treated effluent. MBRs

[2] The WWTP has excess capacity that is not needed. Therefore, future capacity needs of the plant were derived from conservative estimates of growth in the service area based on 2010 and 2020 US Census data and an assumed per capita water consumption of 50 gallons per day (GPD). Water consumption estimates are based on anticipated regulations in California targeting this value for indoor water consumption. It is assumed that all water consumed within the district would ultimately flow to the WWTP for treatment. The planned capacity also includes accommodations for the continued acceptance of wastewater through septage deliveries.

are comprised of an activated sludge process that incorporates a membrane separation step for solids removal and recirculation in place of secondary clarifiers. The MBR system proposed as part of the project consists of up to two identical trains that are packaged systems. These primarily consist of two large steel tanks which make up the biological treatment system with pre-anoxic and aeration zones. Other equipment included in the package includes influent fine screens, internal recycle pumps, mixed liquor pumps, membranes, permeate pumps, process and air scour blowers, chemical feed pumps and the control system (see Figure 2-4). A canopy would extend across the MBR system that would be located in the eastern end of the treatment area to cover the control panels. Once installed, wastewater would be pumped from Pond 2 into the MBR system by the new lagoon pump station that would be located in the retrofitted outlet structure of Pond 2. Any material captured by the fine screen would be removed and hauled offsite. Following secondary treatment by the MBR system, treated water would be disinfected at the existing UV treatment facility. Waste Activated Sludge (WAS) generated through the MBR system would be dewatered in a screw press prior to being sent to sludge drying beds, further described below. New odor control facilities would not be installed as part of this project though the project would include provisions to add odor control systems in the future, if needed. An automatic transfer switch and distribution switchboard, utility pad mounted transformer, and underground duct banks will be installed to support the new secondary treatment process (MBR system) as well as new instrumentation and controls associated with the MBR system.

2.3.2 Sludge Handling

A mechanical dewatering system and/or sludge drying beds would be installed to manage the sludge generated through the MBR process. WAS generated as part of the MBR process would pass through a mechanical dewatering system consisting of a screw press with polymer blending, a feed pump station, and conveyor. Mechanically dewatered WAS would then be distributed across four proposed sludge drying beds having a total capacity of 0.2 acres. In the drying beds, sludge would be further dewatered in two ways: (1) drainage of effluent that would be pumped back to the influent lift station for treatment, and (2) evaporation which would be aided by the high winds and temperatures that occur at the project site. Solids would be periodically removed from the drying beds and transported offsite for disposal. It is anticipated dried sludge would be picked up once a month.

2.3.3 Operations Building

The proposed SCWD operations building would be configured to provide space to manage operation of SCWD's water and wastewater systems, laboratory space, electrical room, a locker room with showers, and offices. The number of workers onsite is not anticipated to change but all would move their operations to the new office building. It's anticipated the site would be regularly staffed with three operators and two administration staff. Elevations of the proposed building are depicted in Figure 2-5. The new Office Building would be single story and approximately 15 feet in height and would be located at the western end of the existing parking area in the center of the WWTP site near the existing office building. Materials and construction would be in accordance with the 2025 California Building Code, including accessibility requirements. The building would be an approximately 52-foot by 26-foot prefabricated building with a metal roof and wall panels with Kynar finish. A geotechnical investigation was conducted and found a potential for expansive soils to be located onsite. Therefore, the foundation of the proposed office building has been designed to mitigate expansive soil conditions through over excavation of 2.5 feet beneath the lowest point of the new foundation and the use of granular engineered

fill which will be compacted to a minimum of 90% of American Society for Testing and Materials (ASTM) D1557 Maximum density. The existing office building will remain as is for continued use by the administrative staff and visitors.

2.3.4 Proposed Site Development

Besides the MBR equipment and canopy and proposed office building, improvements generally consist of excavation for interconnecting piping, equipment replacement/upgrades and improvements to the control system to allow remote monitoring by operations staff. Electrical improvements would be provided by installing a new 480V, 800A service independent of the existing 480V, 225A service. A new 450 kW generator will be installed near the proposed office building to accommodate the new secondary treatment processes at the plant that will run at 520A. Imperial County, and therefore Seeley is enrolled under the State Water Board General Order for Phase II MS4s. This Municipal Storm Water Permitting Program regulates storm water discharges from municipal separate storm sewer systems which are MS4s. As part of construction, it is anticipated the site will be graded to allow stormwater to discharge via overland flow to an unused portion of the site where favorable conditions exist for infiltration. Stormwater flow would not be captured within existing storm sewers and no new storm sewers are proposed as part of the project. To support construction, the existing access point at the southeast corner of the WWTP site would be improved and an unpaved construction access road would be added to provide construction access to the west side of the site. The fencing and gate in this location would be replaced as part of the project. Some clearing around the fence line at this portion of the site will be necessary to remove the existing fence and install new fencing and a gated entry point. The temporary construction access road will be restored at the end of construction.



Figure 2-3: Proposed Site Layout

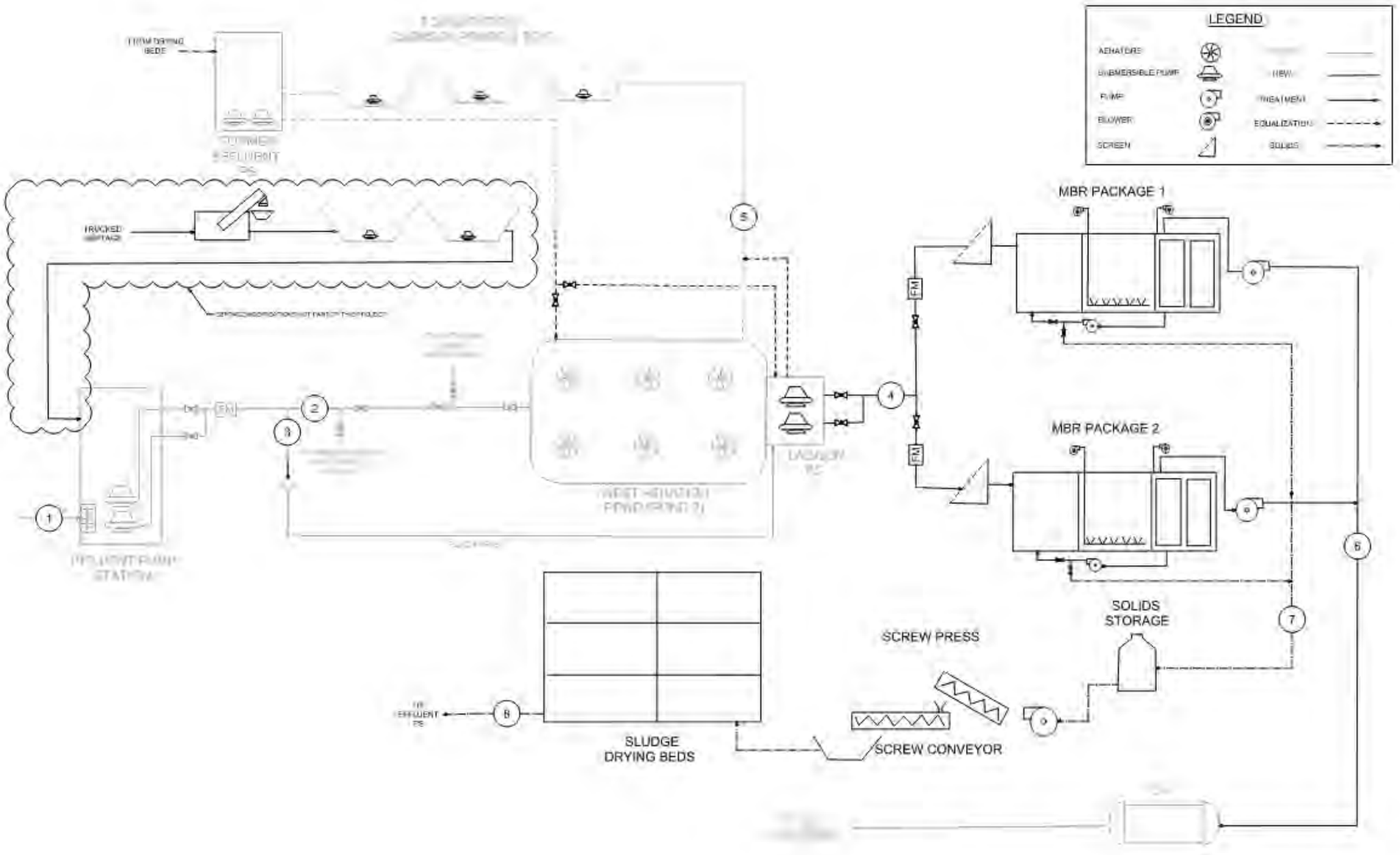
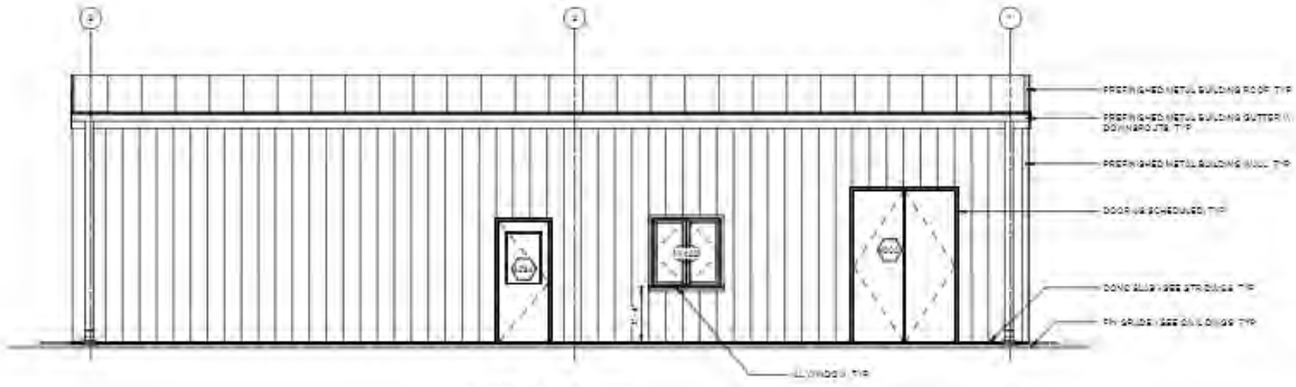
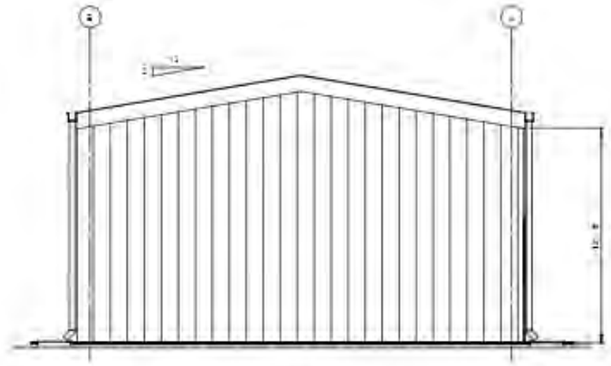


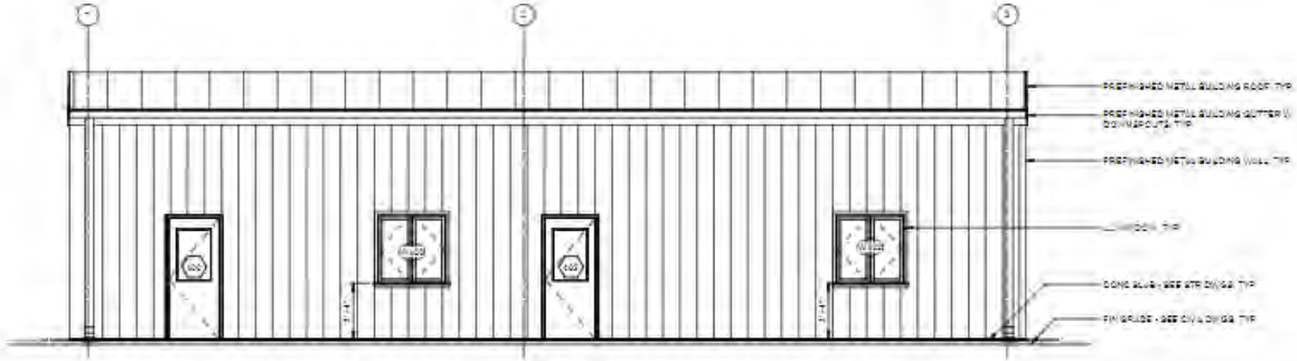
Figure 2-4: Preliminary Process Flow Diagram - MBR



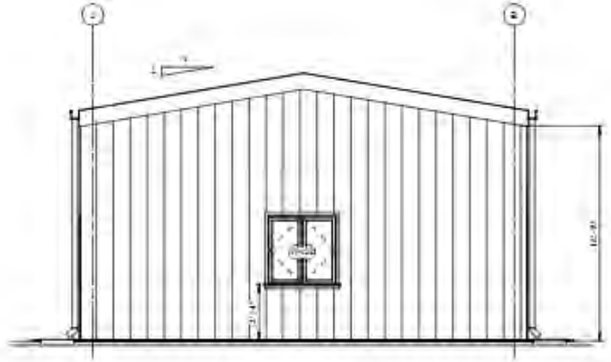
EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION



SOUTH ELEVATION

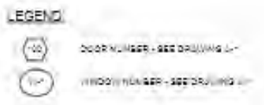


Figure 2-5 Proposed Office Building Elevations

2.4 Project Construction

Construction of the SCWD WWTP Improvements project would occur over the course of two years with a standard 40-hour work week during anticipated typical construction hours (7:00 am to 3:00 pm). All new construction would occur within the current WWTP boundaries.

2.4.1 Construction Sequencing

The construction activities for the proposed project would be divided into two phases: site preparation and facilities construction. During site preparation, which is anticipated to last three months starting in December 2028 (this is with the assumption that the State would realse construction funds within one year), minor demolition would occur at Pond 2 first and dense brush would be removed from the construction and staging areas. Site work and yard piping would follow and overlap with some facility construction that is anticipated to begin in February 2029, specifically construction of the proposed office building and sludge drying beds. After the site preparation is complete, the equipment slabs for the screw press dewatering area, MBR system treatment area, and lagoon pump station would be constructed. Following completion of this work, all electrical, piping, and equipment installation for the new facilities would begin and take around five months to complete starting in June 2029. Testing of the new facilities would begin in October 2029 and occur concurrent to completion of construction. It's anticipated the project would be completed in February 2030.

Table 2-2 summarizes the anticipated number of trucks and workers required to construct the project based on anticipated quantities of excavation, backfill, and concrete/gravel along with the anticipated deliveries required to construct the proposed improvements.

Table 2-2: Anticipated Construction Trip Generation (2029)

	1st Quarter (Jan – Mar)	2nd Quarter (Ap – Jun)	3rd Quarter (Jul – Sep)	4th Quarter (Oct – Dec)
Trucks per day/ month	2	2	2	3
Trucks per quarter	6	6	6	9
Truck Type	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)
Workers per day	10	10	10	10
Trips per day	5	5	5	4

An onsite construction trailer would be needed during construction. A staging area has been identified to the west of the proposed sludge drying beds to house the trailer. The staging area would include parking space for construction personnel and materials laydown. The staging area would be accessed from the existing but improved access road off of New River Boulevard. At the end of construction, temporary construction facilities would be removed and the site restored to match existing conditions.

2.4.2 Construction BMPs

The General Permit for the Discharge of Storm Water from Small MS4s was issued on April 30, 2003, to allow permit coverage for smaller municipalities with populations less than 100,000 people. Imperial County also developed a Stormwater Management Plan (SWMP) as part of their NPDES permit application in 2003 that implemented Best Management Practices (BMPs) to maintain adequate sewage

and storm drain systems. It is likely that project construction will disturb more than one acre of soil so a Stormwater Pollution Prevention Plan (SWPPP) for the site will need to be developed by a Qualified SWPPP Developer (QSD).

2.4.3 Maintenance of WWTP Operations

The WWTP would remain in operation during construction to meet existing permit requirements. During construction, Pond 2 would be removed from service to facilitate installation of the new effluent pump station and overflow piping. During the shutdown, the pond would undergo cleaning and maintenance, existing liner removal, regrading, and new liner installation. Flow would bypass Pond 2 and be temporarily routed to the Clemson ponds. Connection of the new facilities and equipment, including the new generator, would be independent of the existing electrical system. For this reason, all of the existing facilities would operate even when service is being performed on the new generator. The proposed electrical system would be powered by existing power lines from the Imperial Irrigation District (IID) which typically undergo maintenance every 5-12 years. With respect to preventative maintenance on the new generator, this would depend on the type of maintenance being performed to determine the duration of generator shutdown.

2.4.4 Construction Schedule

Table 2-3 summarizes the anticipated project schedule which is driven by the Time Schedule Order requiring SCWD to comply with its revised NPDES permit by 2030. The Time Schedule Order has a Final Reimbursement Request deadline of September 1, 2026.

Table 2-3: Anticipated Design Milestones

Milestone	Anticipated Date
Advertise Project	September 2028
Bid Project	October 2028
Board Approval of Contractor Bid	November 2028
Construction Notice to Proceed	December 2028
Submittals	February 2029
Demolition	December 2028
Site Work, Yard Piping	January-March 2029
Operations Building	February-July 2029
Sludge Drying Bed	February-April 2029
Equipment Slabs	March-May 2029
Install Equipment	June-August 2029
Install Piping, Appurtenances	August-October 2029

Milestone	Anticipated Date
Install Septage System and Appurtenances	October-November 2029
Paving and Grading	November 2029
Substantial Completion	January 2029
Start-up and Testing	October 2029-January 2030
Final Completion	February 2030
Final Reimbursement Request	March 2030

2.5 Project Operations

After construction, it is anticipated the WWTP would operate as follows:

- The influent lift station would continue to be used as currently operated. In the event of the Pond 2 relining, a new section of pipe would be used to convey flow from the lift station to the lagoon pump station at the effluent box of Pond 2.
- Pond 2 would continue to operate with aerators to achieve BOD5 and TSS removal. Under typical operations, influent will remain in the pond for 8 to 20 days and exit into the lagoon pump station. The existing pond overflow would remain and continue to be routed to three of the existing Clemson ponds for use as additional equalization basins during extreme peak events.
- A lagoon pump station would lift wastewater from Pond 2 to the packaged MBR system.
- The effluent pump station would be repurposed to pump flow from the Clemson ponds back to Pond 2, as needed, when the ponds proposed to be used as equalization basins are reaching capacity. In the infrequent instance where this occurs while Pond 2 is offline for maintenance, the flow will be fed directly into the lagoon pump station where it would be pumped to the MBR system.
- The screw press for dewatering of WAS would be operated 8 hours a day, 5 days a week.
- The UV system would operate the same as under existing conditions to achieve adequate disinfection of the wastewater prior to discharge to the WWTP's outfall.
- The new generator, which would provide backup power for the MBR system, lagoon pump station and the existing UV system, would be maintained every six months by an outside contractor (similar to the maintenance program for the existing onsite generator).

Operation of the WWTP would require a similar number of truck and worker trips as under existing conditions. Specifically, the number of truck trips to the site for deliveries is approximately 2 per month. There are two to three operators onsite to run the WWTP and nearby water treatment plant for SCWD. There are typically two administrative staff onsite during the day.

2.6 Environmental Setting and Surrounding Land Uses

The existing wastewater treatment plant is currently situated on a 31-acre parcel owned by SCWD. The New River is located to the west of the WWTP and is a severely polluted waterway that flows north across the United States-Mexico border approximately 60 miles to the Salton Sea. The RWQCB, Colorado River Basin Region has monitored the water quality of the New River since 1975 and is responsible for addressing the New River's water quality issues and ensuring that activities and discharges in Imperial County do not contribute to pollution. As stated, discharge of the WWTP's effluent to the New River is dictated by Waste Discharge Requirements (WDR) as contained in Order R7-2-17-0016 NPDES CA0105023 issued by the RWQCB. The facility is located in a Federal Emergency Management Agency (FEMA) Zone X Flood Zone, an area of minimal flood hazard.

Major roadways surrounding the project site include El Centro Street to the north, Interstate 8 to the south, New River Boulevard to the west and Bennet Road to the east (Figure 1-2). The WWTP site is relatively flat and surrounded by vacant land directly to the north, west, and south. There are two streets of single-family homes located directly across New River Boulevard from the entrance to the WWTP and further east. The WWTP site is improved with the existing treatment facilities, parking and the existing office building. There are some trees and other shrubs onsite near the parking area and to the north of Pond 1 and Pond 2. Views from the site to the west and south include the Laguna Mountains. The project site is near lands owned by the Kumeyaay (Diegueño/Kamia/Ipai/Tipai)-affiliated tribes.

2.7 Permitting and Regulatory Authorization Requirements

Table 2-4 lists the permits and approvals anticipated to be required to support the project.

Table 2-4: Anticipated Permits and Approvals

Regulatory/Authorizing Entity	Permit or Approval
State	
State Water Resources Control Board (SWRCB), Division of Drinking Water	Water Supply Permit Amendment National Pollutant Discharge EliminationSystem Stormwater General Permit and Stormwater Pollution Prevention Plan Approval
State Historic Preservation Office	National Historic Preservation ActCompliance Consultation
Native American Heritage Commission on behalf of Kumeyaay-affiliated tribes	AB52 Tribal Resources Consultation
County / Local	
Imperial County Air Pollution Control District	Permit to Construct, Permit to Operate
Colorado River Basin Regional Water Quality Control Board	NPDES Permit
SWRCB	SWPPP (Stormwater Pollution Prevention Plan)
Imperial County Planning	Zoning, Plot/site plan, paving/grading, demolition,
Imperial County Public Works	Right-of-way, encroachment permit
Imperial County Planning & Development Services	Property owner acknowledgement, county business licensure, workers compensation insurance
Imperial County Building Department	Fire Mitigation Fee Review
Imperial County Air Pollution Control District	Permit to Construct, Permit to Operate

3. INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

LOCATION MAPS
NOT TO SCALE

Project Title:	Seeley County Water District Wastewater Treatment Plant Improvements Project
Case No.	N/A
Assessor's Parcel No.	APN: 051-430-007; 051-430-008; 051-430-009; 051-430-010
Lead Agency Name andAddress:	Seeley County Water District 1898 W Main Street Seeley, CA 92273
Project Location:	Seeley, CA 92273 Imperial County
Project Sponsor's Name andAddress:	Seeley County Water District 1898 W Main Street Seeley, CA 92273
General Plan Designation(s):	N/A
Zoning:	GS S-2 (Government/Special Public Use)
Contact Person:	Miriam Rosales Administrative General Manager
Phone Number:	(760)-352-6612
Date Prepared	October 15, 2021 (updated April 2026)

3.1 Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project, asindicated by the checklist and corresponding discussion on the following pages.

☐ Aesthetics	☐ Agriculture / Forestry Resources	☐ Air Quality
☐ Biological Resources	☒ Cultural Resources	☐ Energy
☒ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☐ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	☒ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

3.2 Determination

On the basis of this initial evaluation:

☐ I find that the proposed Project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there **WILL NOT** be a significant effect in this case because revisions in the Project have been made or agreed to by the Project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.

☐ I find that the proposed project **MAY** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.

☐ I find that the proposed Project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (1) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

MRh

4/10/26

Miriam Rosales

Date

Seeley County Water District

3.3 Purpose Of This Initial Study

This Initial Study has been prepared in accordance with the CEQA Guidelines Section 15063(c)to provide a preliminary analysis of the proposed project's actions and to determine if the project, as proposed, may have a significant effect upon the environment. The findings determined from the preliminary analysis are presented in the form of the Initial Study, which will be used insupport of the preparation of a Mitigated Negative Declaration.

3.4 Evaluation Of Environmental Impacts

A discussion of the environmental checklist is included below. In general, the format followed includes a discussion of the setting and an impact analysis of the proposed project. In some resource categories, control measures are identified to minimize potential impacts. Control measures are procedures that shall be incorporated into the Contract Documents that are known to further reduce the potential for impacts based on regulatory agency requirements, standards in the industry, and construction/operating experience. Reference and information resources for the checklist are included in Chapter 4. As appropriate, mitigation measures are included to reduce impacts to less than significant levels.

I. AESTHETICS

SETTING

The SCWD WWTP Improvements project would be constructed entirely within the boundaries of the existing plant located in Seeley. The area surrounding the project site is generally comprised of dry, arid terrain with the occasional brushes and trees. Immediate surrounding land uses include residential and open space areas, including the New River. Approximately 20 homes are located adjacent to the eastern edge of the WWTP across New River Boulevard. Vacant land surrounds the WWTP to the north, west, and south with agricultural fields in the distance. The town of Seeley is located to the east. Views from the residential homes toward the WWTP to the west include views of the chain link fencing that surrounds the site, the Clemson ponds, the existing office building and some vegetation in and around the site. The Laguna Mountains are visible in the distance from this vantage point. A cultural resources records search identified three previously recorded cultural resources within a half-mile radius of the project area (all three of which are historic structures); however, it is not anticipated that these structures include scenic views that include the project site (see Section V, Cultural Resources).



Figure 3-1: Location Map

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS Except as provided in Public Resources Code Section 21099, would the project:				
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 or County scenic highway or County-designated scenic road?	☐	☐	☒	☐
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 points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

(Sources: Imperial County General Plan: Conservation and Open Space Element, 2016, Imperial County Visual Resource Inventory (VRI) Ratings for Bureau of Land Management (BLM) Managed Lands)

Less Than Significant Impact: Criteria Ia, Ic

The project will be constructed entirely within the WWTP site which is not near any scenic vistas. Public views of the Laguna Mountains occur from New River Boulevard and from homes located across New River Boulevard to the east. Views from these locations already include existing WWTP infrastructure in the foreground, most prominently the Clemson ponds, septage receiving facility, parking areas, the existing office building, and trees and shrubs that aid in blending the site with its surroundings (Figure 3-1 and Figure 3-2). During construction, the Contractor staging and laydown area will be located on the western edge of the WWTP site, approximately 500 feet from New River Boulevard. A new access point to the site from New River Boulevard will be provided to facilitate installation of a construction access road. This will require clearing and grubbing a few existing bushes, fencing removal, and installation of a gate at the southeast corner of the site (Figure 3-3). Additional brush clearing will take place to the west of the Clemson ponds to facilitate construction access and accommodate installation of the proposed sludge drying beds but is not readily visible from New River Boulevard. All other brush and trees will remain and continue to provide screening of some portions of the site and overall visual blending of the site with its surroundings. Existing vegetation to remain includes vegetation along the fence line adjacent

to New River Boulevard north of the proposed access road and the trees around the existing office building.

Once construction is complete, the packaged MBR system and proposed office building will be the only new aboveground structures. The MBR facility will be located approximately 400 feet beyond the view of the Clemson ponds and septage facility and not readily visible from New River Boulevard. The proposed office building will be located at the far end of the existing parking area. The building will be visible from portions of New River Boulevard and views of the Laguna Mountains may be partially obscured from the portion of New River Boulevard directly adjacent to the plant entrance (Figure 3-1). However, the proposed office building will be constructed as a single-story building and has been designed to mimic the look of existing onsite facilities. In addition, from most vantage points, the new structures will not block views of the Laguna Mountains in the distance. Views of the improved WWTP will maintain the visual character of existing views from New River Boulevard. Therefore, the project will have a less than significant impact on a scenic vista or other scenic resource.



Google Maps Streetview 2021, New River Boulevard, Seeley, CA, 32.7942109N, 115.6988789E Image Captured May 2018, viewed 1 October 2021, https://www.google.com/maps

Figure 3-1 View of the SCWD WWTP Entrance from New River Boulevard (looking West)



Google Maps Streetview 2021, New River Boulevard, Seeley, CA, 32.7934595N, 115.6989001E Image Captured May 2018, viewed 1 October 2021, https://www.google.com/maps

Figure 3-2 View of the SCWD WWTP from New River Boulevard



Google Maps Streetview 2021, New River Boulevard, Seeley, CA, 32.7929314N, -115.6989388E Image Captured May 2018, viewed 1 October 2021, https://www.google.com/maps

Figure 3-3 View of the Southeast Corner of SCWD WWT (Proposed Access Road Location)

No Impact: Criteria Ib

The nearest state scenic highway at Interstate 8 is located approximately 1.5 miles from the project site, from which the proposed project is not anticipated to be visible. There are no rock outcroppings that will be impacted by the project. Scenic resources are not anticipated to be impacted by the project. No historic buildings within a state scenic highway will be affected and no impact or damage will occur to any state scenic highways as a result of this project's construction. Therefore, no impact to views from state scenic highways will occur.

No Impact: Criteria Id

Construction of the project will take place during daytime construction hours. During construction, and once construction is complete, the WWTP will continue to operate as under existing conditions. Lighting added as part of the project would be consistent with requirements of the California Occupational Health and Safety Administration (Cal/OSHA) Lighting would only be light emitting diodes (LED) light fixtures and poles with downlighting only to provide illumination of the WWTP grounds for the safety of plant personnel and site security. The lighting does not represent a new source of substantial light or glare and will have a less than significant impact on daytime and nighttime views in the area. Therefore, no impact associated with light or glare will occur.

MITIGATION MEASURES

None.

II. AGRICULTURAL RESOURCES

SETTING

According to the California Department of Conservation's Important Farmland Map, the project site is classified as Urban and Built-up Land (Figure 3-4). Prime Farmland and Farmland of Statewide Importance is located to the north, south, and west of the project site. The closest area designated as prime farmland directly abuts the northeastern portion of the project site but will be unaffected by project activities. All other land designated as prime or important farmland is located at least 0.3 miles from the project site.

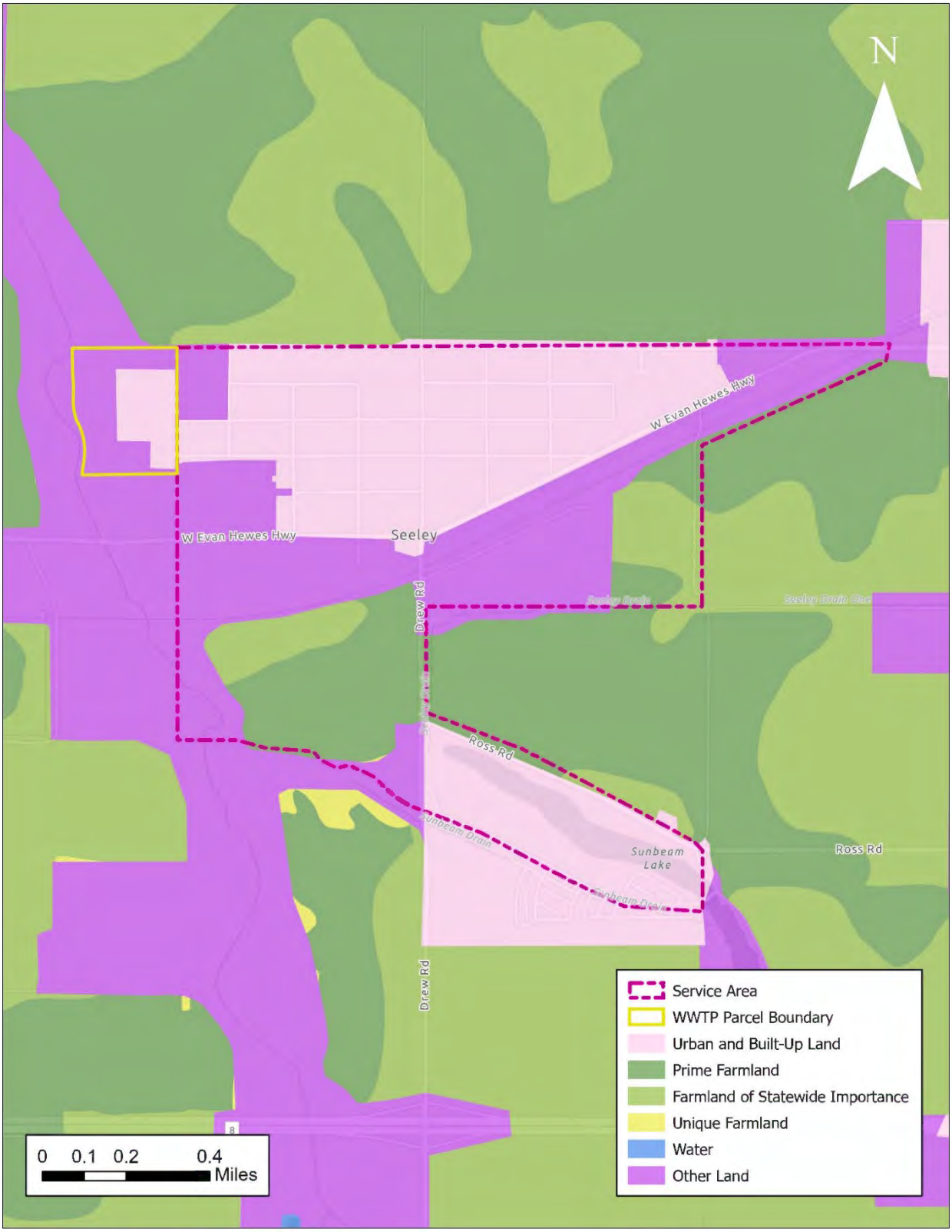


Figure 3-4: Important Farmland Map of Seeley

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES Would the Project:				
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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined in Public Resources Code section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒

(Sources: "California Important Farmland Time Series," accessed July 20th, 2021; Title 9, the Land Use Ordinance Division 5: Zoning Areas Established for Imperial County from the Imperial County Planning & Development Services website, accessed October 12, 2021)

No Impact: Criteria IIa-IIe

The project site is located at the existing SCWD WWTP. This site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The existing zoning designation for the project site is G/S, meaning that it is designated for use as a Government/Special Public Zone (see Section XI, Land Use and Planning). The site is not designated for agricultural use and will not require any rezoning. Therefore, neither the construction nor operation of the project will conflict with the Williamson contract. In addition, the project site is not located on or near any areas that are designated as forest land or

timberland and no impacts to any areas with these zoning designations will occur as a result of the project. Construction and operation of the project will not interfere with or result in the conversion of existing prime farmland into non-agricultural use or forest land into non-forest use. Therefore, no impact to agricultural or forest resources will occur.

MITIGATION MEASURES

None.

III. AIR QUALITY

SETTING

The project site is located within the Salton Sea Air Basin (SSAB) and is regulated within the jurisdictional boundaries of the Imperial County Air Pollution Control District (ICAPCD). The SSAB is characterized as an arid desert region whose climate is largely influenced by large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. The ICAPCD's Air Quality Management Plan (AQMP) is administered through the California State Implementation Plan (SIP) which can be revised by the California Air Resources Board (CARB). The air quality control plan contained in the SIP is a comprehensive and constantly changing document outlining all criteria necessary to attain California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). The most recent AQMP revision for the ICAPCD portion of the SIP was from this year.

The ICAPCD regulates stationary sources (with respect to federal, state, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies, and conducts public awareness programs. Conformance with the AQMP for development projects is determined by demonstrating compliance with local land use plans and/or population projections, meeting the land use designation set forth in the local General Plan, and comparing assumed emissions in the AQMP to proposed emissions. The project must demonstrate compliance with all ICAPCD applicable rules and regulations, as well as local land use plans and population projections.

Criteria air pollutants are contaminants for which the state and federal air quality standards have been established. The SSAB exceeds federal standards for Imperial County for ozone (O_3) and small particulate matter ($PM_{2.5}$). The USEPA has classified the region as marginal nonattainment for 8-hour O_3 NAAQS as of 2021 based off the 2015 USEPA Green Book standards for this pollutant. As of 2015, the USEPA has designated Imperial County as a moderate nonattainment area for 24-hour $PM_{2.5}$ NAAQS based off 2012 USEPA Green Book standards for this pollutant. All of Imperial County is designated as a nonattainment area for the PM_{10} NAAQS. Imperial County is considered as attainment or unclassifiable with respect to the NAAQS for all other criteria pollutants. With respect to the state air quality standards, Imperial County is a state nonattainment area for ozone (O_3) and large/coarse particulate matter (PM_{10}) and is either in attainment or unclassified for other pollutants. These attainment levels are summarized in Table 3-1.

Table 3-1. National Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for the Imperial County portion of the SSAB

Criteria Pollutant	Standard	Designation *
8-Hour Ozone	NAAQS	Nonattainment
	CAAQS	Nonattainment
CO	NAAQS	Unclassified (Attainment)
	CAAQS	Attainment
NO_2	NAAQS	Unclassified/Attainment
	CAAQS	Attainment
SO_2 [f]	NAAQS	Attainment
	CAAQS	Attainment
PM_{10}	NAAQS	Nonattainment
	CAAQS	Nonattainment
$PM_{2.5}$	NAAQS	Nonattainment (central portion) Unclassified (remainder)
	CAAQS	Attainment
Lead	NAAQS	Unclassified/Attainment
	CAAQS	Attainment
Hydrogen Sulfide (H_2S)	CAAQS	Unclassified
Sulfates	CAAQS	Attainment
Vinyl Chloride	CAAQS	Unclassified
Visibility Reducing Particles	CAAQS	Unclassified

Notes: Source: Imperial County General Plan: Conservation and Open Space Element, 2016
*USEPA often only declares Nonattainment areas; everywhere else is listed as Unclassified/Attainment or Unclassified

The ICAPCD has also developed CEQA Air Quality Guidelines that establish significance thresholds for evaluating new projects and provide guidance for evaluating air quality impacts of projects and plans. ICAPCDs most recent CEQA Air Quality Handbook is from December of 2017. The Air Quality Guidelines provide procedures and significance thresholds for evaluating potential construction and operational-related impacts during the environmental review process consistent with CEQA requirements.

The ICAPCD thresholds of significance are designed to establish the level at which ICAPCD believes air pollution emissions would cause significant environmental impacts under CEQA. The ICAPCD's most recent CEQA Air Quality Guidelines were updated in December 2017. The ICAPCD enforced significance thresholds using state CEQA thresholds as a model. The ICAPCD CEQA Air Quality Handbook was used to determine the proper level of analysis for this improvements project. Table 3-2 shows these significance thresholds for operations and Table 3-3 shows the thresholds for construction. For project operations, Tier I projects may have an impact on air quality but it's anticipated that the impact would be less than significant following evaluation of proposed project emissions. Projects that meet the Tier II emissions thresholds are considered by the ICAPCD to have a significant impact on

regional and local air quality. In these cases, a more comprehensive air quality analysis is required along with the incorporation of additional mitigation measures to help reduce the air quality impacts associated with the project.

Table 3-2 Imperial County Air Pollution Control District Significance Thresholds for Project Operations

Criteria Pollutant	Tier I	Tier II
Nitrogen Oxide (NO_x) and Reactive Organic Gas (ROG)	Less than 137 pounds per day	137 pounds per day and greater
PM_{10} and Sulfur Oxide (SO_x)	Less than 150 pounds per day	150 pounds per day and greater
Carbon Monoxide (CO) and $PM_{2.5}$	Less than 550 pounds per day	550 pounds per day and greater

Source: ICAPCD 2017

Table 3-3 Imperial County Air Pollution Control District Significance Thresholds for Project Construction

Pollutant	Threshold
PM_{10}	150 pounds per day
ROG	75 pounds per day
NO_x	100 pounds per day
CO	550 pounds per day

Source: ICAPCD 2017

IMPACT ANALYSIS

RESOURCE CATEGORY/ SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY Would the Project:				
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?	☐	☐	☐	☒

Less than Significant Impact: Criteria IIIa-IIIb

The project includes construction a proposed office building, a lagoon pump station, and onsite piping and electrical conduits and installation of a packaged MBR treatment system. The project also involves upgrades to existing equipment – the Clemson ponds and effluent pump station within the footprint of the existing facilities. As a result, construction emissions for the project will include exhaust from the operation of conventional construction equipment, minor on-road emissions from employee vehicle trips and haul truck trips, and fugitive dust from grading and vehicle travel on paved and unpaved surfaces.

Once constructed, the project will operate similar to existing conditions with the main difference being the method of secondary treatment. Currently, secondary treatment is conducted with pressure sand filters. Once constructed the MBR treatment system will provide secondary treatment with associated solids being applied to onsite sludge drying beds. The number of staff on site – three operators and two administrative staff – are anticipated to be the same as existing conditions. Therefore, operational emissions will include ten vehicle trips per day of full-time employees to commute to and from the project site, and up to two trucks per month of deliveries (e.g., chemicals and equipment). The Septage receiving station is currently out of service, but if it is put back in service then septage deliveries would be anticipated via truck and would similar to conditions in 2022 when the receiving station was last in service. Chemicals to be stored onsite include sodium hypochlorite, citric acid, polymer and petroleum. All chemicals will be properly stored and include secondary containment. It is not anticipated there will be emissions associated with storage and use of these chemicals onsite.

Air dispersion modeling was conducted to assess whether the project has the potential to result in an exceedance of an air quality standard. Air quality impacts associated with project construction and operation were evaluated using the California Emissions Estimator Model (CalEEMod 2020.4.0), a

statewide land use emission computer model. The model uses default data (e.g., emissions factors) provided by the California Air Districts to account for local requirements and conditions, as well as project-specific inputs to quantify potential criteria pollutants and greenhouse gas (GHG) emissions. Emissions of criteria air pollutants were estimated using project construction details, project operations information, and a combination of emission factors from the following sources, in addition to CalEEMod:

- Emission estimates and default data from sources such as USEPA AP-42;
- Emission factors, CARB vehicle emission models, and studies from California agencies such as the California Energy Commission (CEC); and
- Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) provided by the various California air districts to account for local requirements and conditions.

Construction Emissions

Air emissions during construction include those associated with site preparation, grading, and installation of electrical infrastructure. During site preparation and grading, PM_{10} can be released due to soil disturbance. Diesel exhaust emissions are generated during construction through heavy equipment use such as dump/haul trucks. Overall construction emissions will vary on a day-to-day basis depending on factors such as the types and number of vehicles and equipment onsite at the time, the number of workers, the level of activity, and the length of time over which these activities occur on-site.

Project construction is anticipated to take approximately 12 months to complete. Construction of the proposed project would occur in the following sequence: (1) Demolition; (2) Site Preparation and Yard Piping Preparation; (3) Facility Installation; (4) Equipment Installation; (5) Piping; and (6) Paving and Grading.

The total exhaust emissions estimated to be generated for each of these activities are presented in Table 3-4. Estimates from CalEEMod are shown alongside the ICAPCD thresholds of significance for construction activities for various criteria pollutants included in the ICAPCD CEQA Air Quality Handbook (2017). As shown, there will be emissions associated with project construction, but the project's daily construction emissions are not anticipated to exceed the ICAPCD thresholds for CO, ROG, NOx, and PM_{10}. In addition, the project will adhere to the requirements of ICAPCD Regulation VIII for the control of fugitive dust. The control measures listed at the end of this section will be incorporated into the project and would be anticipated to further reduce the amount of particulate matter emissions associated with the project.

Table 3-4: Estimated Construction Emissions by Phase

Construction Phase Activity	Pollutant Emission (pounds per day)					
	ROG	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
Demolition	0.45	3.6	4.8	18.8	2.1	0.008
Site Preparation and Yard Piping Preparation	1.7	16.1	15.2	19.1	2.5	0.04
Facility Installation	0.95	7.8	8.2	18.8	2.2	0.02
Equipment Installation	0.82	6.9	5.8	42.3	4.5	0.03
Piping and Septage System Installation	0.37	3.6	2.9	18.6	2.0	0.01
Paving and Grading	0.01	0.006	0.06	14.8	1.5	0.0002
Total Emissions (pounds per day)	4.3	38.0	37.0	132.4	14.8	0.11
ICAPCD Significance Thresholds (pounds per day)	75	100	550	150	--	--
Exceed Threshold?	No	No	No	No	--	--

Notes:
Source: Model results and assumptions are provided in Appendix A of this IS/MND.
Significance thresholds are from the ICAPCD 2017 CEQA Air Quality Handbook
Exceedance thresholds were determined by comparing daily emissions for unmitigated onsite and offsite construction emission estimates from CalEEMod (2020.4.0) using the "general light Industry" land use category and modifying default values, where applicable.

Operational Emissions

Once constructed, the project requires operation and maintenance activities and up to five full-time employees will be present onsite. It is conservatively assumed that for day-to-day inspection and minor maintenance, additional employees would commute to the site as needed. Annual operations are assumed to be similar to current conditions with administrative staff and routine operations. In addition, additional staff associated with more complex operations activities were assumed to be necessary, as follows:

- For site inspection and minor repairs, up to an additional two one-way worker trips per day would be generated.
- Routine maintenance activities will include backwashing, which is expected to occur four times annually over a total of 90 days. Also, routine maintenance activities will include sending one haul truck for transporting solid waste from the sludge drying beds to a nearby landfill and one haul truck to deposit solid waste from the sludge drying beds three times during this 90-day period. Up to an additional two staff members will be onsite to support this effort.

As shown in **Table 5-6,** the project's operational emissions are not anticipated to exceed the ICAPCD thresholds for CO, ROG, NOx, PM10, and PM2.5.

Table 3-5 Estimated Emissions Associated with Project Operations

Operational Activities	Pollutant Emissions (pounds per day)				
	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
Mobile (Vehicle Use)	0.4	0.3	1.6	36.8	3.7
Area (Products and Equipment)	1.1	0.00004	0.005	0.00002	0.00002
Energy Use	0.04	0.4	0.3	0.03	0.03
Off-Road Equipment	0.7	4.4	4.3	0.2	0.2
Peak Daily Emission (Total)	2.3	5.1	6.2	37.0	3.9
ICAPCD Significance Thresholds (pounds per day)	137	137	550	150	550
Exceed Threshold?	No	No	No	Yes	No

Notes:
Source: Model results and assumptions are provided in Appendix A of this IS/MND.
Significance thresholds are from the ICAPCD 2017 CEQA Air Quality Handbook
Exceedance thresholds were determined by comparing daily emissions for unmitigated onsite and offsite construction emission estimates from CalEEMod (2020.4.0) using the "general light Industry" land use category and modifying default values, where applicable.

The project will be required to comply with all applicable ICAPCD rules and requirements during construction and operation to reduce air emissions. Emission greater than thresholds of significance, adopted by the air district (ICAPCD) for project construction and operations, determine compliance with the goals of the attainment plans in the region (**Table 3-2** and **Table 3-3**). As such, emissions below the ICAPCD regional mass daily emissions thresholds will not conflict with or obstruct implementation of the applicable air quality plans because they indicate that project emissions will be below these thresholds.

As shown in **Table 3-6,** the project is also consistent with the applicable air quality policies and objectives from the Imperial County General Plan: Conservation and Open Space Element.

Table 3-6: Project Consistency with ICAPCD Plan Policies

Applicable Policies	Project Compliance	Analysis
Conservation and Open Space Element: Protection of Air Quality and Addressing Climate Change Goal: Goal Number 7		
Goal 7: The County shall actively seek to improve the quality of air in the region	Consistent	The project will comply with all applicable ICAPCD rules and requirements during construction and operation to reduce air emissions.
Objective 7.1: Ensure that all project and facilities comply with current Federal, State, and local requirements for attainment of air quality objectives.	Consistent	The project will comply with current federal and State requirements for attainment to adhere to air quality objectives by following all applicable ICAPCD rules and regulations to reduce fugitive dust and emissions. The project will also comply with the ICAPCD Air Quality CEQA Handbook's standards.
Objective 7.2: Develop management strategies to mitigate fugitive dust. Cooperate with all Federal, State and local agencies in the effort to attain air quality objectives.	Consistent	The project will comply with all federal and State agencies and mandates in order to attain proper air quality objectives by complying with ICAPCD's Air Quality CEQA Handbook standards.
Objective 7.4: Enforce and monitor environmental mitigation measures relating to air quality.	Consistent	The project will comply with any mitigation measures as needed according to the guidelines set forth in ICAPCD's Air Quality CEQA Handbook.

Source: Imperial County General Plan: Conservation and Open Space Element, 2016 Control Measures Recommended by ICAPCD

Based on the emissions estimated to be generated during construction and operation of the proposed project as compared to ICAPCD CEQA air quality thresholds, the project will not violate any applicable air quality standards or existing air quality plans in the region. The proposed project will contribute to incremental increases in ROG, NO_x, CO, $PM_{2.5}$ and PM_{10} but the impact is anticipated to be less than significant since activities will generate pollutant emissions below established thresholds. Therefore, the project will have a less than significant impact on air quality plans and concentrations of criteria pollutants.

Less than Significant Impact: Criteria IIIc

The project site is in a generally rural area and surrounded by agricultural fields or vacant lots to the north, west and south. The closest sensitive receptors to the project site are the residential homes located across New River Boulevard. As discussed above, unmitigated emission of criteria pollutants from construction and operation of the project are modeled to be well below the ICAPCD thresholds of significance. Additionally, implementation of recommended control measures presented below will ensure compliance with ICAPCD rules and regulations and applicable air quality plan control measures. Therefore, the project will have a less than significant impact on sensitive receptors with respect to pollutant concentrations.

No Impact: Criterion IIId

Wastewater onsite is currently stored in Pond 2 and the Clemson ponds, all of which are open to the atmosphere. There is no odor control for this wastewater and odor control will not be added as part of the project; however, the project would include provisions to add odor control systems in the future, if needed. Wastewater will continue to be stored in Pond 2 and the Clemson ponds. Besides odor and the emissions discussed in this section, no other emissions are anticipated as part of the project. Therefore, the project will have no impact on odor or other emissions.

Control Measures

As stated in the ICAPCD CEQA Air Quality Handbook guidelines, in order to mitigate fugitive dust, all construction sites, regardless of size, must comply with the requirements contained within Regulation VIII – Fugitive Dust Control Measures. Whereas these Regulation VIII measures are mandatory and are not considered project environmental mitigation measures, the ICAPCD CEQA Handbook's required additional standard and enhanced mitigation measures listed below shall be implemented prior to and during construction. ICAPCD will verify implementation and compliance with these measures as part of the grading permit review/approval process. The standard measures for fugitive dust control and combustion equipment and additional 'discretionary' measures applicable to the project that will be implemented during construction are as follows:

- All disturbed areas, including Bulk Material storage which is not being actively utilized, will be effectively stabilized and visible emissions will be limited to no greater than 20% opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps or other suitable material such as vegetative ground cover.
- All onsite and offsite unpaved roads will be effectively stabilized and visible emissions will be limited to no greater than 20% opacity for dust emissions by paving, chemical stabilizers, dust suppressants and/or watering.
- The transport of Bulk Materials will be completely covered unless six inches of freeboard space from the top of the container is maintained with no spillage and loss of Bulk Material. In addition, the cargo compartment of all Haul Trucks will be cleaned and/or washed at delivery site after removal of Bulk Material.
- All Track-Out or Carry-Out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area.
- Movement of Bulk Material handling or transfer will be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers or by sheltering or enclosing the operation and transfer line.
- Exposed soil will be watered with adequate frequency for continued moist soil. The exposed soil will most likely be in those areas where active grading and vehicle movement occurs so it should be watered with adequate frequency in these areas.
- Ground cover in disturbed areas will be replaced as quickly as possible.
- Vehicle speed for all construction vehicles will not exceed 15 mph on any unpaved surface at the construction site.
- Alternative fueled or catalyst equipped diesel construction equipment, including all off-road and portable diesel-powered equipment will be utilized onsite.

- Idling time will be minimized either by shutting equipment off when not in use or reducing the time of idling to 5 minutes as a maximum.
- The hours of operation of heavy-duty equipment and/or the amount of equipment in use will be limited to the extent feasible.
- Fossil fueled equipment will be replaced with electrically driven equivalents (provided they are not run via a portable generator set).

MITIGATION MEASURES

None.

IV. BIOLOGICAL RESOURCES

SETTING

The proposed project is located in Seeley, California, located in Imperial County near El Centro and is surrounded by low-density residential and neighborhood commercial land uses (see Section XI, Land Use and Planning). The proposed upgrades to the WWTP would be constructed in already disturbed areas within the property boundaries of WWTP. Because of its developed condition, the project site contains limited habitat. Much of the proposed project site is devoid of natural vegetation and does not support high integrity wildlife habitat. The project site is located in habitat classified as Disturbed (Agriculture/Urban) by Imperial County (Imperial County 1993 General Plan Update EIR).

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES Would the Project:				
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 Services?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or 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?	☐	☐	☐	☒
f) Conflict with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

(Sources: California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0); United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC))

Less than Significant Impact: Criterion IVa

As previously described, the proposed project consists of upgrades to existing facilities and additional facilities to be constructed within previously disturbed areas of the project site. A desktop review of potential natural resources was conducted to identify resources that could be affected by the project.

Birds. The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) search listed the Yuma Ridgway's (clapper) Rail (*Rallus obsoletus yumanensis*) and Southwestern Willow Flycatcher (Empidonax traillii extimus) as a federally listed endangered species and a California state listed endangered and threatened species as occurring within the project vicinity. No critical habitat for either species has been listed by the USFWS. The California Natural Diversity Database (CNDDB) was consulted within the boundaries of United States Geological Survey (USGS) 7.5' Seely Quadrangle Map, which listed the Yuma Ridgway's (Clapper) Rail (*Rallus obsoletus yumanensis*) and the California Black Rail (*Laterallus jamaicensis coturniculus*) as potentially present. The California Black Rail is listed by California as a threatened species.

The Yuma Ridgway's Rail is one of the smaller subspecies of clapper rails. According to the Lower Colorado River Multi-Species Conservation Program (LCR MSCP), this species has been found along the lower Colorado River after construction of dams and the subsequent creation of marsh habitat. On the lower Colorado River, this species is currently found in scattered marshes from the Colorado River Delta in Mexico to Topock Marsh at Havasu National Wildlife Refuge, near Needles, California. The species' range now stretches north to the Virgin River and Beaver Dam Wash, near Littlefield, Arizona, and Mesquite, Nevada, the Muddy River near Overton, Nevada, and the Las Vegas Wash near Las Vegas, Nevada, and Ash Meadows National Wildlife Refuge northwest of Las Vegas. The Yuma clapper rail is also found east of the Colorado River along portions of the Gila, Salt, and Bill Williams River drainages and several other locations in central and southwestern Arizona. Significant populations are also found in marshes at the south end of the Salton Sea, which is located approximately 20 miles north of the project. This species is consistently found in freshwater marshes that are composed of a variety of marsh types that are dominated by emergent plants, including southern cattail, bullwhip bulrush, three-square bulrush, and sedges (USFWS Species Fact Sheet, Arizona Ecological Services Office, July 2017).

The Southwestern Willow Flycatcher is one of four subspecies of the willow flycatcher. According to the United States Bureau of Reclamation, the Southwestern Willow Flycatcher breeds in dense, mesic riparian habitats at scattered, isolated sites in New Mexico, Arizona, southern California, southern Nevada, southern Utah, southwestern Colorado, and, at least historically, extreme northwestern Mexico. According to the LCR MSCP, the breeding habitat for the Southwestern Willow Flycatcher consists of dense riparian vegetation.

The California black rail is the resident black rail subspecies that occurs in California coastal salt and brackish marshes from Bodega Bay to Morrow Bay, with additional populations known from freshwater marshes near or in the northern Sierra Nevada foothills. According to the LCR MSCP, it is presently found at seep marshes and springs along the Coachella and All-American canals, at one location on the New River south of the Salton Sea, and at Big Morongo Canyon in San Bernardino County. Along the lower Colorado River, the California black rail is found at the Cienega de Santa Clara and several other sites in the Colorado River Delta in Mexico. It is found from Laguna Dam north to Imperial Reservoir, portions of the Imperial National Wildlife Refuge, on Colorado River Indian Tribe lands, at the Bill Williams River National Wildlife Refuge, and the Havasu National Wildlife Refuge. This species inhabits tidal marshes and freshwater marshes in the western United States and Mexico. In areas around the lower Colorado River basin, their habitat is characterized by shallow, stable water level, gently sloping shorelines, and vegetation dominated by fine-stemmed bulrush or grasses. It uses sites with shallower water than other North American rails.

Potential habitat for these special-status bird species, namely the Yuma Ridgway's Rail (*Rallus obsoletus yumanensis*), Southwestern Willow Flycatcher (Empidonax traillii extimus), and California Black Rail (*Laterallus jamaicensis coturniculus*) may be found in the project vicinity, namely around the New River and Sunbeam Lake. These locations are approximately 400 feet and 5,000 feet from the construction site, respectively. The Yuma Ridgway's Rail nest between April to May and can be found near shore, in shallow water, and in marsh interiors. The Southwestern Willow Flycatcher nests begins in late May and early June with fledging from late June to mid-August and prefer dense riparian habitats. The California Black Rail may nest between March and July, and primarily nest within southern cattail or spikerush, and are elevated above the mud substrate in clumps of vegetation, which may include: California or giant bulrush, southern cattail, and three-square bulrush (LCR MSCP).

Since there will be no direct construction impacts or work proposed in any riparian areas, there will be no direct impacts to potential habitat or nesting sites at either of these potential habitat areas (Table 3-7.). During construction, there will be increased noise levels above the existing ambient noise level, however, the noise will be temporary, intermittent, and would be minimal beyond the limits of the WWTP site. Based on the construction equipment to be utilized (discussed in Section XIII, Noise), it is not expected to have significant indirect disturbance (i.e., as a result of increased noise or vibration) at any habitat present at New River or Sunbeam Lake. No blasting, pile driving, or similarly loud, intermittent noise is proposed. Additionally, when construction concludes, the continued operation of the improved WWTP will not significantly increase noise levels above existing ambient noise levels. Therefore, the project will have a less than significant impact on identified special status species in the vicinity of the project site.

Table 3-7. Threatened and Endangered Species in the Project Vicinity

Common Name (Scientific Name)	State/Federal Status	Habitat	Project Site Suitability?	Potential Effects of Project
Yuma Ridgway's Rail (Rallus obsoletus yumanensis)	Federal – Endangered State - Endangered	Freshwater marshes that are composed of a variety of marsh types that are dominated by emergent plants, including southern cattail, bullwhip bulrush, three-square bulrush, and sedges	Yes – New River is 400 feet; Sunbeam Lake is 5,000 feet	There is potential suitable habitat located in the freshwater marsh areas of both New River and Sunbeam Lake, which may be comprised of cattails and bulrushes. However, there is no work proposed in this area, and no significant indirect effects are anticipated. Therefore, no effects to this species or its habitat are anticipated.
California Black Rail (Laterallus jamaicensis coturniculus)	Federal – None State - Endangered	Tidal and Freshwater marshes. Characterized by shallow, stable water level, gently sloping shorelines, and vegetation dominated by fine-stemmed bulrush or grasses	Yes - New River is 400 feet, Sunbeam Lake is 5,000 feet	There is potential suitable habitat located in the freshwater marsh areas of both New River and Sunbeam Lake, which may be comprised of cattails and bulrushes. However, there is no work proposed in this area, and no significant indirect effects are anticipated. Therefore, no effects to this species or its habitat are anticipated.
Southwestern Willow Flycatcher (Empidonax traillii extimus)	Federal – Endangered State - Endangered	Areas from near sea level in vegetation alongside rivers, streams, or other wetlands (riparian habitat such as cottonwood/willow and tamarisk vegetation) with microclimatic conditions.	Yes - New River is 400 feet, Sunbeam Lake is 5,000 feet	There is potential suitable habitat located in the freshwater marsh areas of both New River and Sunbeam Lake, which may be comprised of cattails and bulrushes. However, there is no work proposed in this area, and no significant indirect effects are anticipated. Therefore, no effects to this species or its habitat are anticipated.

Sources: United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC); USFWS 78 FR 344; California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB), BIOS Export, August 30, 2021.

Vegetation. A desktop review of the Inventory of Rare and Endangered Plants of California provided by the California Native Plant Society was conducted (Table 3-8). The results indicated five rare and/or endangered plants within Imperial County, CA that have a designated legal status under the Federal Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA). Overall, based on the desktop assessment, no suitable habitat was identified for these rare and endangered plants within the project vicinity. There is no desert dune or Sonoran Desert scrub habitat within the project vicinity (Sand

and Dune Systems, DRECP, updated June 2013) for Peirson's milk-vetch (*Astragalus magdalenae* var. *peirsonii)*, Wiggins' croton (*Croton wigginsii*), Borrego bedstraw (*Galium angustifolium ssp. Borregoense*), or algodones dunes sunflower (*Helianthus niveus* ssp. *Tephrodes)* to occur. Additionally, coastal scrub, valley and foothill grasslands, and vernal pools habitats were not identified in the project vicinity, therefore, San Diego button-celery (*Eryngium aristulatum* var. *parishii)* is unlikely to occur. Therefore, the project will have a less than significant impact on endangered plant species in the vicinity of the project site.

Table 3-8. Rare and Endangered Plant Species in Imperial County, CA

Common Name (Scientific Name)	State/Federal Status	Habitat	Project Site Suitability?	Potential Impacts of Project?
Peirson's milk-vetch (Astragalus magdalenae var. peirsonii)	Federal – Threatened State - Endangered	Desert Dunes	No	No desert dune habitat is in the project vicinity. Therefore, no effect on Peirson's milk-vetch is anticipated as a result of the proposed project.
Wiggins' croton (*Croton wigginsii*)	Federal – None State - Rare	Desert dunes, Sonoran Desert scrub	No	No desert dune habitat or Sonoran Desert scrub is in the project vicinity. Therefore, no effect on Wiggins' Croton is anticipated as a result of the proposed project.
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	Federal – Endangered State - Endangered	Coastal scrub, Valley and foothill grassland, Vernal pools	No	There is no coastal scrub, valley and foothill grassland, and vernal pool habitat in the project vicinity. Therefore, no effect on San Diego button-celery is anticipated as a result of the proposed project.
Borrego bedstraw (Galium angustifolium ssp. Borregoense)	Federal – None State - Rare	Sonoran Desert scrub	No	No Sonoron Desert scrub habitat or is in the project vicinity. Therefore, no effect on Borrego bedstraw is anticipated as a result of the proposed project.
Algodones Dunes sunflower (*Helianthus niveus* ssp. *Tephrodes*)	Federal – None State - Endangered	Desert Dunes	No	No desert dune habitat is in the project vicinity. Therefore, no effect on Algodones dunes sunflower is anticipated as a result of the proposed project.

Source: California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v9-01 0.0)

No Impact: Criteria IVb, IVc

The WWTP and proposed facilities are not located on lands that are classified as either riparian or wetlands. Although the New River is located approximately 400 feet west of the WWTP, there are no project activities proposed within this riparian habitat, and therefore the project will not impact riparian habitat or sensitive natural communities, nor will it adversely impact federally protected wetlands. As shown in Figure 3-5, from the Imperial County General Plan, the project site is not located in any sensitive biological habitats. Therefore, the project will have no impact on riparian or wetland resources or sensitive biological habitats.

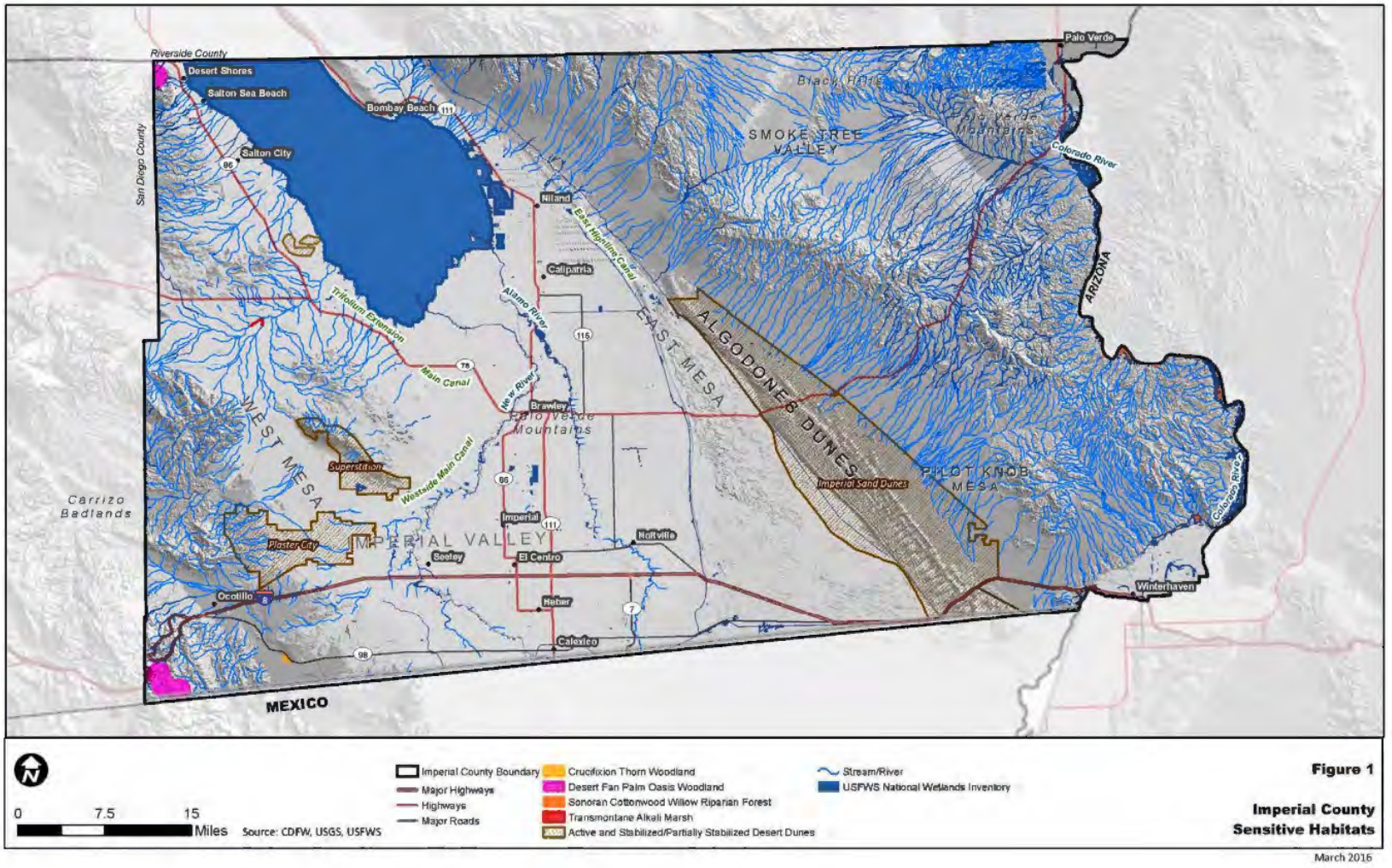


Figure 3-5: Imperial County Sensitive Habitats

No Impact: Criteria IVd

A wildlife corridor is typically a link of wildlife habitat, generally containing native vegetation, which joins two or more larger areas of similar wildlife habitat that would otherwise be separated by development and other forms of human activity. The proposed project activities all occur within a previously disturbed and fenced area located within a region that is designated as Disturbed (Agriculture/Urban) habitat. Furthermore, the project not located within or in the vicinity of native resident or migratory wildlife corridors, or native wildlife nursery sites. Therefore, the project will have no impact on the movement of fish or wildlife.

No Impact: Criterion IVe & IVf

Construction of the project will take place within previously disturbed area within a larger urban/agricultural region. The project will include minor removal of dense brush and trees. This vegetation is not protected or within any designated wildlife habitat. Seeley does not have tree or biological resources ordinances. However, the Imperial County General Plan: Conservation and Open Space Element includes a biological resource conservation policy with the goal to provide a framework for the conservation and enhancement of natural and created open space which provided wildlife habitat values. This policy includes numerous programs related to conservation of wildlife and vegetation habitat, particularly that of native or high biological value. As described elsewhere in this section, no significant adverse impacts to biological resources are anticipated as a result of the project given its location on an existing WWTP site, and the relative to absence of local and regional biological resources. Therefore, the project will have no impact with respect to local policies or ordinances, or habitat conservation plans.

MITIGATION MEASURES:

None.

V. CULTURAL RESOURCES

SETTING

According to the Imperial County General Plan: Conservation and Open Space Element, cultural resources in Imperial County can generally be classified in two ways. Resources are either prehistoric and represent remains from activities that occurred amongst the Cahuilla, Tipai, and Quechan people that inhabited the area prior to sustained European contact or historic. Historic resources can be further divided into those from Spanish, Mexican and American periods, each marked by different timeframes of colonization, exploration, and development. According to the General Plan, there is a potential for cultural resources to exist on the project site since it is within 1,000 meters of a water source (the New River).

To investigate the potential for cultural resources to exist onsite, a cultural resources record search of the WWTP within a half-mile buffer radius was conducted by the South Coastal Information Center (SCIC) at San Diego State University (SDSU) in August 2021 on behalf of the California Historical Resources Information System (CHRIS). The records search identified three previously recorded cultural resources within a half-mile radius of the project area (all three of which are historic structures). Two of the identified structures are located within 0.25 miles of the project area; of these, the nearest is located approximately 0.12 miles from the project area (P-13-008418, US Highway 80). No historic buildings or structures or those eligible for listing on the National Register of Historic Places are located on or near the project site. The oldest structures on site were constructed after 1965. In addition to the SCIC, the Native American Heritage Commission (NAHC) was contacted on July 6th, 2021, to determine the potential for cultural resources that may be of interest to any Native American Groups, in particular Kumeyaay-affiliated tribes identified in the vicinity of the project area.

Information developed to support an Application for Certification (AFC) with the California Energy Commission and Bureau of Land Management for a proposed Imperial Valley Solar (formerly SES Solar Two) Project was also used to describe the potential for cultural resources to exist at the project site. During planning for the Imperial Valley Solar Project, SCWD WWTP effluent was selected as a primary source of water for use during construction and operation of the proposed solar facility. To support future use of the SCWD WWTP effluent as a water supply source, URS Corporation completed a report in 2010 evaluating the potential for environmental impacts to occur from required, related upgrades at the SCWD WWTP. This 2010 evaluation included an assessment of the potential for construction at the WWTP to impact cultural resources. Specifically, the 2010 report relied upon a 2009 cultural resources survey, conducted by Dudek at the SCWD WWTP. The survey included a cultural resources pedestrian survey and a cultural record search and, similar to the cultural resources survey conducted by the SCIC for the proposed project, no significant cultural resources were identified within the project area. In addition, the URS report summarized a subsequent records search of the WWTP and a 13-mile transmission main along Evan Hewes Highway. As part of that search, 21 cultural resource locations were identified as previously documented in the vicinity of the project site. These resources included pottery shards, refuse deposits, tools, ceramics, and cremation. However, no sites were documented within the boundaries of the WWTP.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

(Sources: South Coastal Information Center: Cultural Resources Records Search, 2021; Native American Heritage Commission Correspondence, 2021; Imperial County General Plan: Conservation and Open Space Element, 2016; Dudek, SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010).

Less Than Significant Impact with Mitigation Incorporated: Criteria Va-Vc

According to a cultural records search of the project site conducted by the SCIC in August 2021, no previously recorded cultural resources records were found on site. The closest recorded sites are documented within 0.25 miles of the project site and will not be disturbed as a result of the project. As described above, a similar records review and cultural resources survey of the WWTP site was conducted by Dudek in 2009. The survey included a cultural resources pedestrian survey of the site, including existing buildings, and a cultural record search and no significant cultural resources were identified within the project area. In addition, the August 2021 correspondence from the SCIC indicated that based on the small number of cultural resources recorded within a half-mile radius of the project area, there is a low likelihood of encountering unrecorded cultural resources.

Regarding tribal resources, responses to an inquiry regarding the potential for the project to impact resources in the vicinity of the project site have not been received, but a mitigation measure is provided below (see CUL1) in the event resources are encountered. The monitor will be qualified to identify a resource and recommend how it is to be handled, whether through excavation and curation, or preservation in place.

The proposed project site is not located on any known cemetery and construction activities are not likely to impact any human remains since cultural resource surveys showed no recorded sites with human remains on the project site. A mitigation measure is provided below (see CUL-2) should any remains be encountered on the project site. With the mitigation measures in place, it is anticipated the project will have a less than significant impact on cultural resources.

MITIGATION MEASURES

CUL 1: Cultural resource training will be provided by a qualified archaeologist for all construction crew members prior to any ground disturbing activities. This training will ensure that construction workers are prepared for discovery during ground-disturbing activities. This training will also include a handout "Alert Sheet", which will include photos and descriptions of the property, potential resources, and protocol for stopping work and notification in the event of a discovery.

CUL 2: A qualified archaeologist shall conduct a limited program of targeted archaeological monitoring of ground disturbance to mitigate impacts from the accidental discovery of cultural resources. The qualified archaeologist shall be empowered to determine the extent and duration of monitoring based on observations during ground disturbing activities.

CUL 3: A Tribal monitor shall be present during ground disturbing activities. Should a resource be uncovered by these activities, all work in that area shall be halted or diverted until the monitor can evaluate the nature and significance of the find and provide written recommendations. Monitors shall be empowered to redirect work activities, to inspect identified resources, and to direct their ultimate disposal, whether through documentation and curation, or preservation in situ.

CUL 4: If human remains are encountered during construction, the steps and procedures specified in the California Health and Safety Code §7050.5 (HSC 7050.5), State CEQA Guidelines 15064.5(d), the California Public Resource Code §5097.98, as well as the Cultural and Paleontological Resources General Plan DEIR as per the County of Napa General Plan Update. The NAHC then designates a Most Likely Descendant (MLD) with respect to the human remains within 48 hours of notification. The MLD will then have the opportunity to recommend means for treating or disposing of, with appropriate dignity, human remains and associated grave goods within 24 hours of notification.

VI. ENERGY

SETTING

SCWD is a California Special District Association (CSDA) member independent of Imperial County. SCWD is a full-service community providing electric, water, wastewater and trash utilities to its population. The project area is served by Imperial Irrigation District (IID) for its electricity; a public agency that was formed in 1911 that entered the power industry in 1936 and serves electricity to more than 150,000 customers in Imperial County.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY Would the Project:				
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?	☐	☐	☐	☒

Less Than Significant Impact: Criterion VIa

The proposed project consists of construction of new facilities with electrical improvements independent of the existing electrical service at the site. Specifically, electrical improvements will be provided by installing a new 480V, 800A service independent of the existing 480V, 225A service. A new 450 kW generator will be installed near the new operations building to accommodate the new secondary treatment processes at the plant that will run at 520A. An automatic transfer switch and distribution switchboard, utility pad mounted transformer, and underground duct banks will be installed to support the new secondary treatment process (MBR system) as well as new instrumentation and controls associated with the MBR system. Construction of the proposed project will require the use of fossil fuels primarily in the form of gas, diesel, and motor oil for equipment, material hauling, and delivery and worker vehicles. Construction vehicle traffic is described in Section XVII, Transportation/Traffic. Direct energy use will include electricity use needed to power construction equipment such as power tools. In the event temporary power may not be available, the contractor will coordinate with the utility provider for temporary power or the use of portable power. All construction vehicles and equipment, listed below in Table 3-9, will be required to comply with the federal and state regulations guiding the use of construction vehicles and equipment, including the California Air Resources Board (CARB) Off-Road Zone Regulation.

Table 3-9: Construction Equipment List

Construction Phase	Duration	Anticipated Fleet	Usage (hours/day)
Site Preparation	3 months	Backhoes	8 (full-time)
		Compressor	8 (full-time)
		Flatbed	8 (full-time)
		Compactor/Roller	8 (full-time)
		Pickup Trucks	8 (full-time)
		Dump Trucks	8 (full-time)
		Grader	6 (4 weeks)
		Paving Equipment	6 (4 weeks)
		Paver	6 (2 weeks)

Facilities Construction	9 months	Arc Welder	6 (2 weeks)
		Compressor	8 (full-time)
		Concrete Mixer/Pump	8 (8 weeks)
		Concrete Vibrator	8 (8 weeks)
		Pickup Trucks	8 (full-time)
		Dump Trucks	8 (full-time)
		Flatbed	8 (full-time)

The proposed project would not require any unusual or excessive construction equipment or practices that would result in wasteful, inefficient, or unnecessary consumption of energy. Due to the temporary nature of the construction activities and compliance with applicable energy regulations, construction-related energy use is expected to have a less than significant impact on energy resources.

The operational energy use of the proposed project will include everyday maintenance of and operation of the facilities and administrative energy use within the proposed office building. It is anticipated SU (Single Unit)-30 haul trucks and dump trucks would visit the site twice a month to haul and dump solids accumulated in the sludge drying beds onto a landfill. The existing generator that powers the southern portion of the site (including the effluent pump station, Clemson pond aerators, influent pump station, and recycle pump station) is maintained every 6 months by an outside contractor. It is assumed that the new generator near the new operations building that will power the newly installed facilities as part of the project will also be maintained every 6 months. Electrical service would be provided by connections to existing power lines served by the IID and new power to the site will not be required. Therefore, it's anticipated there will be a less than significant impact on energy resources associated with operational of the project.

No Impact: Criterion VIb

The proposed project will be required to comply with state and federal energy conservation measures related to construction and operations, including CARB Off-Road Zone Regulation and the Rule for On-Road Heavy-Duty Diesel-Fueled Public and Utility Fleets. Thus, the proposed project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency during construction or operation; no impact will occur.

MITIGATION MEASURES

None.

VII. GEOLOGY AND SOILS

SETTING

According to the Imperial County General Plan: Conservation and Open Space Element, Imperial County is underlain by three natural geomorphic provinces: the Peninsular Ranges, the Colorado Desert, and the Mojave Desert and is a seismically active area with several major active faults, including the Brawley Fault Zone, the Coyote Creek Fault and the Elmore Ranch Fault (in the San Jacinto Fault Zone), the Elsinore Fault, the Imperial Fault, the Laguna Salada Fault (in the Elsinore Fault Zone), the San Andreas Fault, the Superstition Hills Fault, and the Wienert Fault (in the San Jacinto Fault Zone). Figure 3-6 shows the faults within the vicinity of the project site.

The site is in the Salton Trough region of the Colorado Desert physiographic province of southeastern California. The Salton Trough is bounded on the northeast by the San Andreas Fault and Chocolate Mountains west of the Salton Sea and to the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments deposited since the Miocene Epoch (Morton, 1977). The Salton Trough is comprised of the Coachella Valley region of Riverside County and Imperial Valley in Imperial and Riverside counties. Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Review of the current Earthquake Fault Zone maps (California Geologic Survey, 2019a) indicates that the nearest zoned fault is the Superstition Hills fault located approximately 5.4 miles north of the project site.

The Imperial Valley is bordered by the Colorado River to the east and Salton Sea to the west with the Coachella Valley to the north. The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene (present) lake deposits are anticipated to be less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a freshwater lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of Mexico. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 – 20,000 feet.

In February 2021, a geotechnical investigation to explore geotechnical conditions at the project site was completed by LandMark Geo-Engineers and Geologists. The Geotechnical Report for these findings is included in Appendix B, along with an update from 2026. The geotechnical investigation found that subsurface soils onsite consist of about 4 feet of stiff silt clay/clayey silt (CL-ML) soils of low to moderate swell potential. Below this from about 4-13 feet below the ground surface the project site contains medium dense silty sand/sandy silt. Medium stiff to stiff clay soils were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration. The site was also found to have expansive soils. In general, most of near-surface soils in Imperial Valley have silty clays and clays which are moderately expansive (i.e., the soils swell when wet and shrink when dry). The native soils were found to be potentially corrosive but are suitable for use as engineered fill. Groundwater was encountered approximately 10 feet below grade.

The geotechnical investigation also found that the risk of liquefaction induced settlement at the project site is low. Liquefaction can occur within a 9-foot-thick sandy silt/silty sand layer encountered at a depth of 4 feet below ground surface. Potential liquefaction induced settlements of less than 1 inch have been estimated for the project site. Additionally, conditions indicate that there is a very low risk of ground rupture and/or sand boil formation should liquefaction occur.

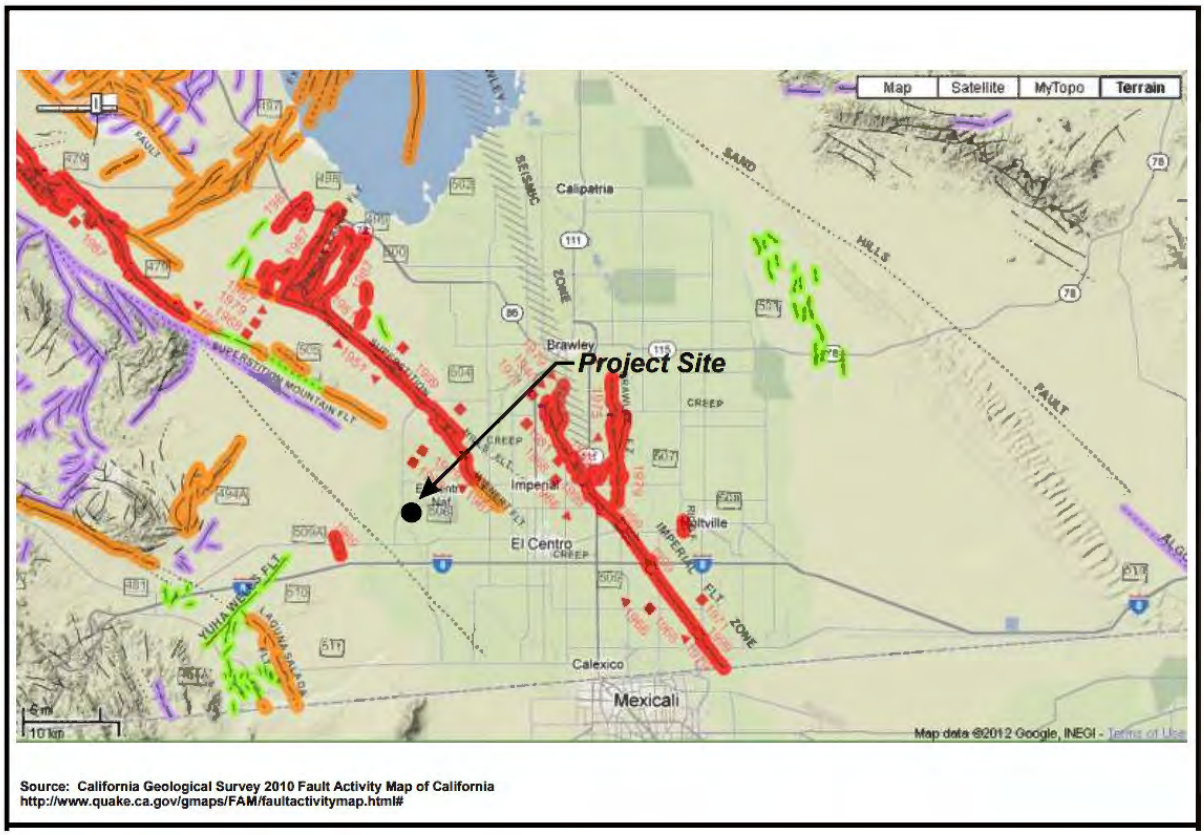


Figure 3-6: Map of Local Fault Zones Near the Project Site

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS Would the Project:				
a) Directly or indirectly cause 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 fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
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-I-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?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

(Sources: Hazen and Sawyer: Seeley County Water District Wastewater Treatment Plant Improvements Preliminary Engineering Report, 2021; LandMark Geo-Engineers and Geologists: Seeley County Water District Wastewater Treatment Plant Improvements Project Geotechnical Report, 2021, Imperial County General Plan: Conservation and Open Space Element, 2016).

Less than Significant Impact: Criterion VIIa

As discussed in the geotechnical investigation report by LandMark Geo-Engineers (Appendix B), the California Geological Survey (2019b) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consists of boundary zones surrounding well defined, active faults or fault segments. The project site does not lie within an A-P Earthquake Fault Zone; therefore, surface fault rupture is considered to be low at the project site.

As described in Appendix B, the soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake and there is a potential for ⅔ inches of liquefaction induced differential settlement at the project site. However, because of the depth of the liquefiable layer, the 10-foot thick non-liquefiable clay layer will likely act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures and, no ground improvement or deep foundation mitigation is required at this project site.

According to the LandMark Geo-Engineers report, the primary seismic hazard at the project site is the potential for strong ground shaking during earthquakes along the Imperial, Laguna Salada, and Superstition Hills faults. However, the project will not exacerbate ground shaking during construction or operation because construction will not require deep excavation, fracking, or construction in bedrock. The project has been designed to comply with the latest edition of the California Building Code for Site Class D using the seismic coefficients developed as part of the geotechnical investigation to reduce the potential for impact to structures from ground shaking associated with earthquakes.

The project site is located adjacent to the New River. There are indications of a landslide on the New River bluff along the western edge of the site. However, all new construction for this project is placed towards the Eastern side of site to avoid landslide risks.

Given the location of the project site, the proposed construction and operational activities, and the use of the California Building Code for design and construction of onsite structures, the project is anticipated to have a less than significant impact on known fault lines, ground shaking, liquefaction, or landslides.

Less than Significant Impact: Criterion VIIb

The project site is relative flat, and construction will not require significant excavation. Excavated soils will be reused onsite for grading purposes and will not represent a loss of topsoil from the site. Appropriate stormwater controls will be in place during construction in a SWPPP developed by a QSD and following construction, stormwater will be redirected from impervious to pervious areas using grading and swales for infiltration into the soils at the project site. Therefore, the project will have a less than significant impact on soil erosion or topsoil.

No Impact: Criterion VIIc

The project site is not located on a geologic unit that is unstable. As discussed in the assessment for Criteria VIIa and VIId the project will not cause destabilization of a geologic unit as a result of an on or

off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Therefore, no impact to geologic units will occur.

Less than Significant Impact: Criterion VIId

The project site contains clays and silts that represent expansive soil conditions. To reduce the risk to life or property due to the presence of expansive soil conditions, the proposed office building has been designed to include over excavation of 2.5 feet beneath the new foundation (for a total excavation depth of five feet). The excavated native solid will be replaced with granular engineered fill which will be compacted to a minimum of 90% of American Society for Testing and Materials (ASTM) D1557 Maximum density as recommended by the geotechnical investigation. Therefore, it is anticipated there will be a less than significant impact with respect to construction on expansive soils.

No Impact: Criterion VIIe

Construction activities will not displace soil and will not use soil that is inadequate to support the use of septic tanks. In addition, sewers are available for the disposal of wastewater and septic facilities are not located on or planned for the project site. No impact will occur.

Less than Significant Impact with Mitigation: Criterion VIIf

Construction activities including excavation for manholes associated with yard piping could impact unidentified paleontological resources that may be present at the project site. In order to determine the possible presence of existing or unrecorded paleontological resources, in accordance with the State of California and other governmental agencies, a paleontological review consistent with the requirements of CEQA and other legislation will be performed. Should significant paleontological resources be identified during the paleontological review at the project site, mitigation measures will be implemented to ensure a less than significant impact (see GEO-1).

Mitigation Measure GEO-1 would reduce the impact of construction activities on potentially unknown paleontological resources to a less-than-significant level by addressing discovery of unanticipated buried resources and preserving and/or recording those resources consistent with appropriate laws and requirements. With the mitigation measures in place, it is anticipated the project will have a less than significant impact on cultural resources.

MITIGATION MEASURES

GEO-1: Prior to ground disturbance, a qualified paleontologist shall be retained to monitor all excavation below three feet and inform construction personnel on what paleontological resources may look like. In the event that any vertebrate fossils are encountered during construction, all ground disturbing activities within 50 feet of the find shall be temporarily halted, and a qualified paleontologist shall document the discovery as needed, to evaluate the potential resource, and to assess the nature and significance of the find. Based on the scientific value or uniqueness of the find, the paleontologist may record the find and allow work to continue, or recommend salvage and recovery of the material, if it is determined that the find

cannot be avoided. The paleontologist shall make recommendations for any necessary treatment that is consistent with currently accepted scientific practices. Any fossils collected from the area shall then be deposited in an accredited and permanent scientific institution where they will be properly curated and preserved.

VIII. GREENHOUSE GAS EMISSIONS

SETTING

The generation of greenhouse gas emissions is produced by both moving and stationary sources, including motor vehicles, the production of electricity and natural gas, and other similar processes. Carbon dioxide is the primary greenhouse gas that has raised the most concern of atmospheric scientists due to current atmospheric levels, current and projected emission levels, and the highly correlated temperature regression curve that has been observed, predicting a future path of rising carbon dioxide levels.

California was the first state to establish regulations that require the reduction of emissions of GHGs from motor vehicles in 2004. The California Global Warming Solutions Act (AB 32) was adopted by the state legislature in 2006. It sets forth a program to achieve 1990 emission levels by 2020 and requires CARB to proclaim 1990 GHG emissions and develop a Scoping Plan, which sets forth GHG reduction methods. CARB has reported that 1990 GHG emissions totaled 427 million metric tons (MMT) for the state of California; CARB adopted a GHG scoping plan on December 11, 2008. The Scoping Plan includes a cap-and-trade program, green building strategies, recycling and waste reduction, and Voluntary Early Actions and Reductions. Governor Brown issued Executive Order B-30-15 in April 2015 establishing a new California goal to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 ensuring the state will continue its efforts to reduce carbon pollution. Additionally, Governor Brown issued Executive Order B-55-18 in September 2018 with the goal to achieve carbon neutrality by 2045 (Executive Office of Governor of California, Edmund G. Brown, 2018).

California SB 375 was signed by the Governor in September 2008 and is intended to at least in part implement greenhouse gas reduction targets set forth in AB 32. The bill encourages regional land use planning to reduce vehicle miles traveled and requires jurisdictions to adopt a sustainable communities strategy.

The ICAPCD regional authority over the control of air pollution from all sources other than emissions from motor vehicles. The ICAPCD has regulatory control over all stationary sources of air contaminants. These stationary sources are divided into point sources, such as factories, geothermal plants and rock quarries, and indirect sources, such as paved and unpaved roads, open areas and construction projects. These types of sources tend to have emissions that fit a generalized category and are considerably too small to warrant permitting. Generally, point sources of air contaminants are required to obtain specific operational permits from the ICAPCD while indirect sources are exempt. Indirect sources are facilities as well as land uses which do not emit a significant amount of pollution on their own but rather attract or generate motor vehicle trips which result in emissions of ozone precursors (VOCs, ROG, NOx), carbon monoxide (CO) and fine particulate matter (PM_{10} & $PM_{2.5}$).

IMPACT ANALYSIS

RESOURCE CATEGORY/ SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS Would the Project:				
a) Generate greenhouse gas 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 greenhouse gases?	☐	☐	☒	☐

(Sources: ICAPCD CEQA Air Quality Handbook, 2017; Imperial County General Plan: Conservation and Open Space Element, 2016; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010; SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; HDR: Draft EIR Wister Solar Energy Facility Project, 2020; CalEEMod Ver. 2020.4.0, 2021).

Less than Significant Impact: Criterion VIIIa and VIIIb

The proposed project will produce GHG emissions during construction and operation. As stated in Section III, Air Quality, the CalEEMod model was utilized to quantify air quality emissions projections, which include GHG emissions. The CalEEMod runs are provided for reference as Appendix A. Determinations of significance for construction-related and operational greenhouse gas emissions were based on the comparison of project-generated emissions to applicable ICAPCD thresholds of 10,000 metric tons per year of CO_2e for construction and operation of industrial facilities.

Table 3-10 shows construction emissions and Table 3-11 shows operational emissions. All construction-related GHG emissions will be temporary and will end once project construction is completed. Operation of the proposed project will generate minimal continuous greenhouse gasses through area source emissions, for instance vehicle trips, energy use at the site, and the potential use of the backup generator under emergency conditions. As shown in the tables, construction and operation of the project is not anticipated to exceed ICAPCD GHG emissions thresholds (10,000 metric tons/year). Operation will not significantly increase mobile emissions since operation of the project will be similar to existing conditions and therefore, the project will not conflict with the reduction goals of SB 375. In addition, the project will not conflict with the goals of Executive Order S-3-05 because the WWTP is not considered a "large emitter' of GHGs (25,000 MG CO_2e/year) requiring cap-and-trade regulation per CARB's regulatory measure to help achieve statewide GHG reduction goals. Therefore, it is anticipated that the impact would be less than significant since the project would not release GHGs above ICAPCD thresholds and would not conflict with an applicable plan, policy, or regulation adopted for the purposed of reducing the emissions of GHGs.

Table 3-10: Construction GHG Emissions Summary (lbs/day)

Construction Activities	CO2	CH4	N2O	CO2e
Year 2022	692.79	0.12	0.00	696.09
Year 2023	8,617.77	2.64	0.013	8,685.44
ICAPCD Threshold (per year)				10,000
Significant Impact?				No

CalEEMod model (2020.4.0). Values shown represent the total annual, unmitigated on-site and off-site GHG emission projections for construction of the proposed project.

Table 3-11 Operational GHG Emissions Summary (lbs/day)

Construction Activities	CO2	CH4	N2O	CO_2e
Total Operational CO_2e				2,247.96
ICAPCD Threshold (per year)				10,000
Significant Impact?				No

CalEEMod model (2020.4.0). Values shown represent the total annual, unmitigated on-site and off-site GHG emission projections for operation of the proposed project.

MITIGATION MEASURES

None.

IX. HAZARDS AND HAZARDOUS MATERIALS

SETTING

The project is located at the existing SCWD WWTP in the northeast portion of Seeley, CA. The area is relatively flat and developed only with the infrastructure necessary to operate the WWTP and support SCWD operations. Hazardous materials used onsite include petroleum to power the emergency generator, sodium hypochlorite and citric acid for cleaning of the MBR and polymer for the dewatering process. All solids collected at the WWTP meet Class B requirements for solid waste and are periodically disposed at a solids handling facility capable of accepting the waste. Treated wastewater effluent is disposed in accordance with SCWD's NPDES permit and is not anticipated to contain hazardous waste.

As part of the project, a review of an environmental database purchased from Environmental Data Resources (EDR) was completed to evaluate the potential presence of hazardous materials at the project area. The review included both the project area and surrounding properties. The review found that the WWTP is identified on the Facility Index System (FINDS) database listing, an inventory of facilities monitored or regulated by the USEPA. No violations or information indicating potential contamination was identified in the FINDS database. Furthermore, the project site is identified on the California Integrated Water Quality System (CIWQS) database listing. No enforcement action or violations associated with the CIWQS listing have been reported for the property within the last five years.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIALS				
Would the Project:				
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 mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport, would the project result in a safety hazard 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?	☐	☐	☐	☒
g) Expose people or structures either directly or indirectly to significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒
h) Expose people to existing or potential hazards and health hazards other than those set forth above?	☐	☐	☐	☒

(Sources: Environmental Data Resources, LLC: EDR Lightbox Standard, 2021).

Less Than Significant Impact: Criteria IXa and IXb

The use of hazardous materials would be limited during construction and will include such materials as gasoline, diesel, oil, and paint (Control Measures IX4 and IX5). Construction of the proposed project would include temporary storage and use of a variety of petroleum and other chemical products in accordance with applicable regulatory requirements and guidelines, including those related to: California Environmental Reporting System (CERS) permitted underground storage, chemical bulk storage and spill reporting requirements; and federal Spill Prevention, Control and Countermeasures requirements. During operation, diesel fuel would be stored onsite and used to power the emergency generators which would be operated every six months for testing and maintenance by an outside contractor similar to current operations. In addition, polymer will now be stored onsite (55 gallons) to blend with the WAS sent from the MBR process to the sludge drying beds. Additionally, sodium hypochlorite (65 gallons) and citric acid (60 gallons) will be stored onsite for MBR maintenance. Finally, the project will allow SCWD to conduct upgrades to the septage receiving facility. This will allow SCWD to hold and test septage prior to treatment to ensure all constituents can be appropriately treated at the WWTP. If the septage contains high concentrations of treatable constituents (BOD, TSS), the septage will incrementally introduced into the WWTP as to not overwhelm the system. In the rare case that the septage contains constituents that cannot be properly treated (high amounts of zinc and cyanide) the septage will be pumped out of the Clemson ponds and hauled to a Class 1 facility. This will avoid the potential for these constituents to leave the plant via the effluent discharge to the New River or solids collected in Pond 2 and the sludge drying beds. As under current operation, all sludge will meet Class B disposal requirements and be periodically collected, dried and hauled to a solid waste facility capable of accepting the waste. No other changes to the use and storage of hazardous materials would occur as part of the project. However, septage will not be accepted during times when Pond 2 is offline for maintenance or sludge removal.

Control measures are incorporated into the project to prevent the accidental spill or release of hazardous materials into the environment. Control Measure IX1 requires the storage and handling of these materials to be in strict accordance with the Material Safety Data Sheets for the products and adherence to all local, State, and federal requirements. Control Measures IX2 and IX3 address sandblasting, painting, concrete cuttings, and other similar activities with risk to employees or the public, and construction worker safety.

IX1. All hazardous materials will be stored or handled in strict accordance with the Material Safety Data Sheets for the products. The storage and handling of potential pollution causing and hazardous materials, including but not limited to gasoline, fuel oil, and paint, will be in accordance with all local, State, and federal requirements. All hazardous materials will be stored or handled in strict accordance with the Material Safety Data Sheets for the products. The storage and handling of potential pollution causing and hazardous materials, including but not limited to gasoline, fuel oil, and paint, will be in accordance with all local, State, and federal requirements.

IX2. During construction or demolition activities, all areas where sandblasting, painting, spraying insulation or other activities that will occur or create inconvenience or be dangerous to property or the health of employees or workers or the public shall be enclosed adequately to contain the dust, overspray, or other hazards. In the event there are no permanent enclosures at the area, or such enclosures are incomplete or inadequate, the Contractor shall be required to provide suitable temporary enclosures. When sawing, cutting, or grinding concrete or other materials that produce

silica dust, water shall be used to prevent the dust from becoming airborne. Personal protective equipment (PPE) including, respiratory protective equipment shall be worn during activities described above. During construction or demolition activities, all areas where sandblasting, painting, spraying insulation or other activities that

IX3. Safety provisions conforming to the U.S. Department of Labor (OSHA), Cal/OSHA, and all other applicable federal, State, county and local laws, ordinances, and codes shall be implemented. The completed work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items, required by the State and federal industrial authorities and applicable local and national codes. The Contractor shall prepare and submit a Health and Safety Plan to the SCWD for approval. The Health and Safety Plan that defines proposed site safety measures, and which notifies workers of the presence of detected concentrations of chemicals at the site shall be reviewed by a certified industrial hygienist prior to submittal. Safety provisions conforming to the U.S. Department of Labor (OSHA), Cal/OSHA, and all other applicable federal, State, county and local laws, ordinances, and codes shall be implemented. The completed work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items, required by the State and federal industrial authorities and applicable local and national codes.

IX4. A safety supervisor who is qualified and authorized to supervise and enforce compliance with the Health and Safety Plan shall be appointed to oversee the implementation of the Safety Plan at the project area. The Safety Plan will include an operation plan with emergency contacts. A safety supervisor who is qualified and authorized to supervise and enforce compliance with the Safety Plan shall be appointed to oversee the implementation of the Safety Plan at the project area. The Safety Plan will include an operation plan with emergency contacts.

In addition, as a result of an EDR Database search of the project site and surrounding area conducted for the project, no violations or information indicating potential contamination or enforcement action or violations associated with hazardous wastes have been reported for the property within the last five years.

The WWTP is required to conform to regulations governing the discharge of effluent to the New River and disposal of solids. During construction and operation, the use of hazardous materials will be governed by control measures established to limit the risk of exposure to humans and the environment. No existing spills or hazardous materials violations have been identified onsite. Therefore, it's anticipated the project will have a less than significant impact on the use, transport, or release of hazardous materials into the environment.

No Impact: Criteria IXc – IXe

The proposed improvements at the WWTP are located 0.4 miles away from the Seeley Elementary School; therefore it does not fall within a quarter-mile of a school (Criterion IX(c)), or within two (2) miles of a public airport or public use airport (Criterion IX(e)). The database report indicated the site is not on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 (Criterion IX(d)), No impact would occur.

No Impact: Criterion IXf

Construction of the project would not physically interfere with an adopted emergency response plan since the proposed project will not result in street closures or detours. Existing streets will not be modified to construct or operate the WWTP. The southernmost entrance to the WWTP off of New River Boulevard will be added to facilitate construction, but this roadway would be from the existing roadway network and would only serve the WWTP. No impact would occur.

No Impact: Criterion IXg

As discussed in Section XX, Wildfire, the proposed project is located within an LRA designated as non-VHFHSZ. Thus, the project will not exacerbate wildfire risks nor expose project occupants to pollutant concentrations from a wildfire or uncontrolled spread of a wildfire and will not expose people or structures to significant risk of loss, injury, or death involving wildland fires. No impact would occur.

MITIGATION MEASURES

None.

X. HYDROLOGY AND WATER QUALITY

SETTING

The project site lies within the Imperial Subregion of the Colorado River RWQCB. There are no perennial or intermittent waterways on the project site. The closest surface water to the project site is the New River and the unnamed tributary that flows from the outfall to the New River. The New River was created in the early 1900's when the Colorado River overflowed a dike and, combined with the Alamo River located further east, flowed through the Imperial Valley to form the Salton Sea. Currently, the highly polluted New River obtains its flow primarily from agricultural irrigation return. The project site is located in the Imperial Valley Groundwater Basin. The Salton Sea is the discharge point for groundwater in the basin and the basin has to major aquifers, an upper and lower aquifer. Similar to surface water in the region, groundwater recharge is largely from agricultural irrigation return. According to the Imperial Irrigation District, groundwater in the Imperial Valley is of poor quality and generally unsuitable for use as a domestic or agricultural supply. At WWTP site, groundwater was encountered at 10 feet below the ground surface during the project's geotechnical investigation. The WWTP operates under a New River discharge permit from the RWQCB, Colorado River Basin which includes effluent limits for a number of pollutants (Order No. R7-2007-0036, NPDES No. CA0105023). As discussed, over the past several years, discharge from the facility has exceeded these effluent limits at times, and SCWD has received several notices of violations.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater 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 imperious surfaces, in a manner which would:				
i) Result in a substantial erosion or siltation on- or off-site;	☐	☐	☐	☒
ii) Substantially increase the rate or amount of surface runoff in a manner which could result in flooding on- or off-site;	☐	☐	☐	☒
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?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

(Sources: Hazen and Sawyer: Seeley County Water District Wastewater Treatment Plant Improvements Preliminary Engineering Report, 2021; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010; Dudek SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; Imperial Valley Groundwater Basin Report – California's Groundwater Bulletin 118 (2004), Imperial Irrigation District Water Supply, accessed October 13, 2021).

Less than Significant Impact: Criterion Xa

The WWTP currently discharges treated wastewater to an unnamed tributary of the New River under Waste Discharge Requirements (WDR) as contained in Order R7-2-17-0016 NPDES CA0105023, issued

by the Colorado River Basin RWQCB. The project would improve the ability of the WWTP to continuously meet current and future WDRs, which has the potential to benefit the New River. Repurposing of two of the Clemson ponds for septage storage and testing will allow SCWD to haul septage that contains constituents that cannot be properly treated (typically with high amounts of zinc and cyanide) to a Class 1 disposal facility. This will avoid the potential for these constituents to leave the plant via the effluent discharge to the New River or solids collected in Pond 2 and the sludge drying beds. As described in Section IX, Hazards and Hazardous Materials, all chemicals stored onsite would have secondary containment to prevent the release of chemicals into the environment. Stormwater quantity and quality would be similar to existing conditions and would infiltrate into permeable areas of the project site. It is not anticipated stormwater would have the potential to contaminate any localized groundwater resources. Therefore, it is anticipated the project will have a less than significant impact on the quality of surface water or groundwater.

No Impact: Criteria Xb, Xc

Construction and operation of the project will not use or pump groundwater. Minor excavation associated with construction will not require groundwater dewatering. The only potential discharge to groundwater would be through the infiltration of stormwater as currently occurs onsite. The increase in impervious surface associated with the proposed project is 4% and is not anticipated to generate large quantities of additional stormwater that have the potential to interfere with groundwater recharge. Only minor site grading is proposed that would not have the ability to impede or redirect flood flows or trigger substantial erosion. Onsite drainage characteristics will be similar to existing conditions. No impact would occur.

No Impact: Criteria Xd

The project site is not within or near a 100-Year Flood Plain. **Figure 3-7** shows the proximity of a 100-Year Flood Plain in relation to the project site. Therefore, it would not place residential communities and facilities under a flood threat. The project site is not at risk of inundation from tsunamis given its inland location, away from the coast on the eastern side of the Laguna Mountains. No impact would occur.

No Impact: Criteria Xe

The project would improve the ability of the WWTP to continuously meet current and future WDRs, which has the potential to benefit the New River. The project would not impede implementation of the Imperial County Groundwater Management Ordinance which governs the preservation, protection and management of groundwater resources within Imperial County since the project would not use or otherwise disrupt groundwater supplies. No impact would occur.

MITIGATION MEASURES

None.



Figure 3-7: FEMA Flood Zones and Flood Hazards Near Seeley WWTP

XI. LAND USE AND PLANNING

SETTING

The SCWD had an approximate population of 2,100 people as of 2017. It is designated as an urban area by the Imperial County Land Use Plan and consists mostly of low-density residential and neighborhood commercial land uses as shown in Figure 3-8. The site is bordered on the east by low density and medium-high density residential areas (R-1 and R-3, respectively), and on the west by New River. The WWTP has a land use designated as Government/Special Public. Land uses in Seeley outside of the boundaries of the district are largely agricultural and residential. Land use within the SCWD is governed by Imperial County's Zoning Ordinance which is guided by the goals and policies established under Imperial County's General Plan. The SCWD does not have land use authority and works closely with Imperial County regarding new development proposals and service considerations to ensure planned land uses are consistent with one another. A project known as the Sunbeam Lake Estates was recently approved by the Imperial County and Local Agency Formation Commission (LAFCO) for development directly adjacent to the current eastern boundaries of the district. Sunbeam Lake Estates will result in the construction of 403 single family homes and approximately 312 multi-family apartment units as. A total of 16.95 acres of commercial land is also designated for development. However, if these development projects advance and require expansion of the SCWD's service area or upgrades at the WWTP, that work would be funded by the respective developers and constructed at a later date.

The WWTP site is zoned as G/S/S-2, meaning that it is designated for use as a Government/Special Public Zone according to Title 9, the Land Use Ordinance for Imperial County, under Division 5: Zoning Areas Established (Figure 3-9). The G/S designation allows for the construction, development, and operation of governmental facilities and special public facilities such as security facilities, jails, solid and/or hazardous wastes facilities and other special public benefit facilities.

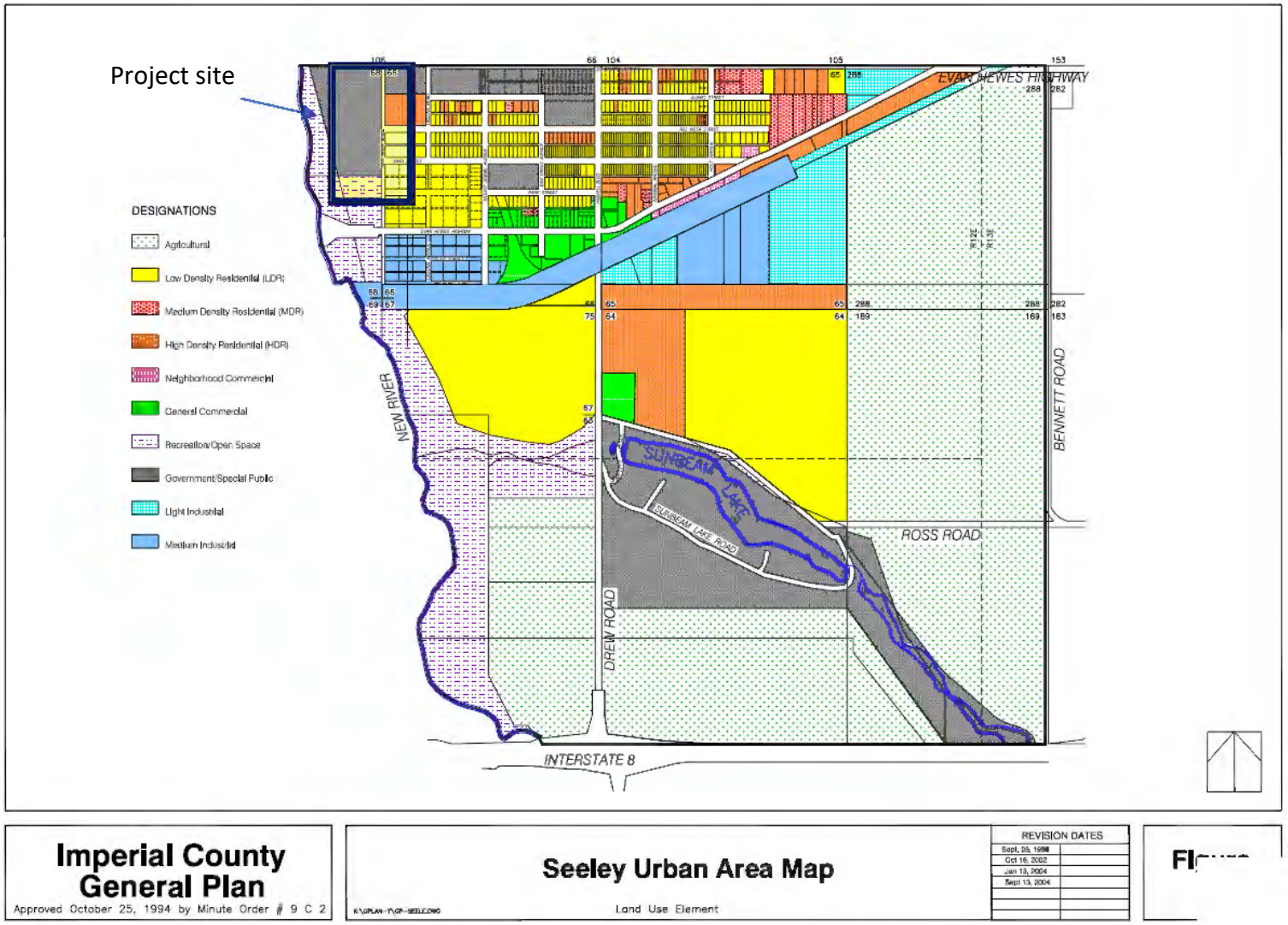


Figure 3-8 Land Use within the SCWD Boundary

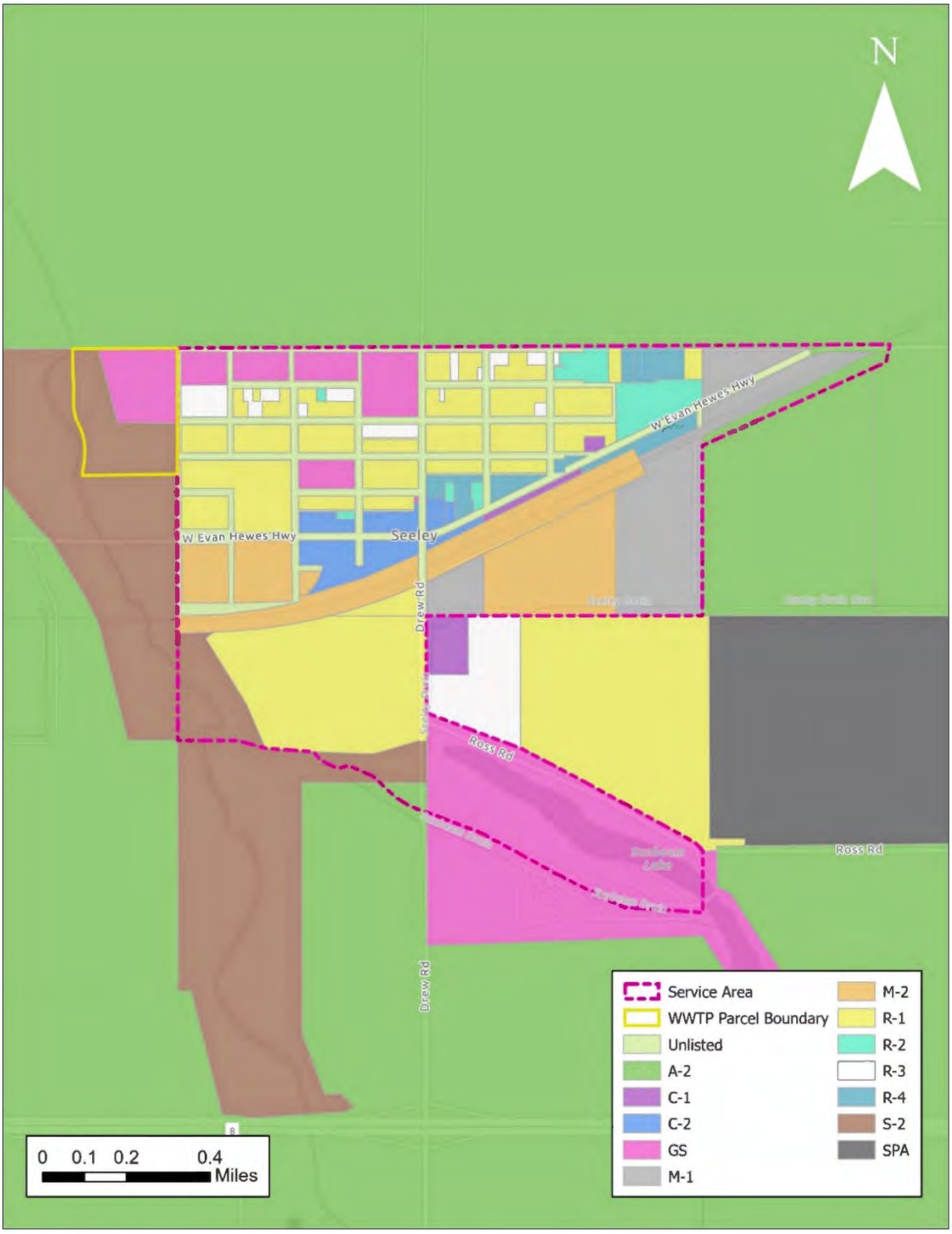


Figure 3-9 Existing Zoning Designations for Seeley

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING Would the Project:				
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?	☐	☐	☐	☒

(Source: Hazen and Sawyer: Seeley County Water District Wastewater Treatment Plant Improvements Preliminary Engineering Report, 2021; Hazen and Sawyer: USDA Preliminary Engineering Report, 2021, Title 9, the Land Use Ordinance Division 5: Zoning Areas Established for Imperial County from the Imperial County Planning & Development Services website on October 12th, 2021).

No Impact: Criteria XIa, XIb

The proposed project is located on a parcel of land already being used for the SCWD's WWTP and existing office building so its land use will not change. Low density residential housing on the eastern side of the New River Boulevard across from the WWTP will not be physically divided since all proposed work will take place on the WWTP site on the western side of New River Boulevard. The WWTP will continue to be used for the same purpose as the existing site, in accordance with G/S zoning designation for public benefit facilities. The construction and operational activities on-site will not interfere or violate any of the zoning regulations that the G/S zone is subject to including building size, set-back and off-street parking requirements established under Chapter 20 of Division 5 of the Imperial County Land Use Zoning Ordinance.

The public policy plan in the area is the Imperial County General Plan. The plan provides guidance around development activities within Imperial County related to nine separate elements: Land Use; Housing; Circulation and Scenic Highways; Noise; Seismic and Public Safety; Agricultural, Conservation and Open Space; Geothermal and Transmission; and Water. The following elements would not be affected by the project since construction and operation would be similar to existing conditions and take place on the project site: Land Use, Housing, Circulation and Scenic Highways, Agricultural, and Geothermal and Transmission. The remaining elements are presented in Table 3-12 along with a discussion of the project's consistency with each element. The proposed project will not divide an established community or conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Therefore, no impact would occur.

Table 3-12 Public Policy Review – Imperial County General Plan

Applicable Element of the Imperial County General Plan	Summary of the Element	Project Compliance	Analysis
Noise	There are three goals of the noise element, (1) Provide an acceptable noise environment for existing and future residents in Imperial County, (2) To review proposed projects for noise impacts and require design which will provide acceptable indoor and outdoor noise environments and, (3) To include noise analyses in long range planning.	Consistent	As discussed in Section XIII, Noise, construction of the project will generate a temporary increase in noise at the project site. However, these temporarily increases will take place on the project site during typical construction hours and are not anticipated to cause a noise impact at sensitive receptors. Operational noise will be the same as existing conditions.
Seismic and Public Safety	The three goals of this element are to (1) Include public health and safety considerations in land use planning including geologic and floodplain hazards, (2) minimize potential hazards from natural and human-related phenomenon including seismic hazards, and (3) protect the public from exposure to hazardous materials and wastes.	Consistent	As discussed in Section VII, Geology and soils, the project will be constructed to reduce the risk of damage to life or property due to seismic events. The project is located within a FEMA Flood Zone X, an area of minimal flood hazard. As described in Section IX, Hazards and Hazardous Materials, controls such as secondary containment are included in the project to reduce the potential for public exposure to harmful substances.
Conservation and Open Space	There are nine goals within this element. They are: (1) conserve environmental resources for future generations, (2) conserve biological resources, (3) preserve cultural resources, (4) conserve geological resources, (5) conserve visual resources, (6) conserve water resources, (7) protect air quality and address climate change, (8) protect open space and recreational opportunities, (9) conserve and restore the Salton Sea.	Consistent	As described in Sections IV, VI and XVI, biological, geological and open space resources are not present on the project site. Mitigation measures have been incorporated in the event cultural resources are encountered and there will be no impact to visual resources as a result of the project (Sections V and I). Incremental emissions of criteria pollutants and GHGs will be below thresholds established by the ICAPCD (Sections III and VIII). The project goal is to improve WWTP performance to conform to current and future effluent discharge limits which will have the potential to benefit the Salton Sea, local water resources and by extension, preserves environmental resources for future generations.

Applicable Element of the Imperial County General Plan	Summary of the Element	Project Compliance	Analysis
Water	There are four goals for this element: (1) secure the provision of safe and healthful sources and suppliers of domestic water, (2) protect surface waters, (3) provide water to assure the continuation of agricultural land uses; and (4) assure the safety of ground and surface waters from toxic or hazardous materials and wastes.	Consistent	The project will not impact domestic or agricultural water supply. As described in Section IX, discharges of hazardous materials into surface water will not occur as a result of the project. The project goal is to improve WWTP performance to conform to current and future effluent discharge limits which will have the potential to benefit the quality of receiving water bodies, including the New River.

MITIGATION MEASURES

None.

XII. MINERAL RESOURCES

SETTING

According to the Imperial County General Plan: Conservation and Open Space Element, Imperial County contains a variety of existing mineral resources such sand and gravel, manganese, gold, and gypsum-anhydrite. However, these mineral deposits are not understood to exist at or in the vicinity of the project site (Figure 3-10).

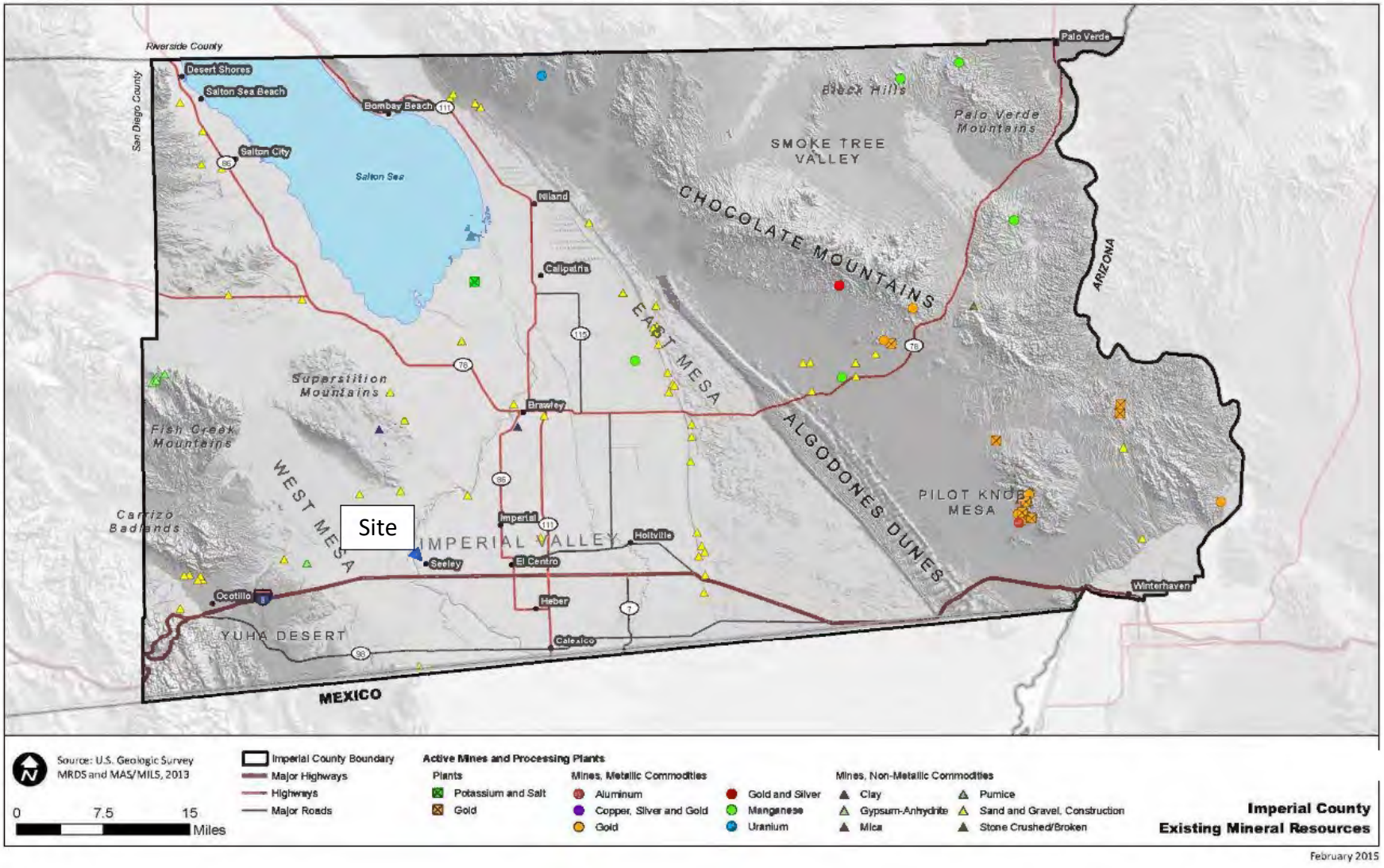


Figure 3-10: Imperial County Existing Mineral Resources

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES				
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒

(Sources: Imperial County General Plan: Conservation and Open Space Element, 2016).

No Impact: Criteria XIIa, XIIb

As shown in Figure 3-10, the closest mineral resources to the project site are located approximately 5 miles north. There are no locally important mineral resource recover sites in Seeley and construction would take place on the existing WWTP site. Construction activities will not impact any existing mineral resources contained in the county. No impact would occur.

MITIGATION MEASURES

None.

XIII. NOISE

SETTING

The Project site is located in Seeley, with project operations occurring on an approximately 14-acre area. The site is bordered on the east by low density and medium-high density residential areas (R-1 and R-3, respectively), and on the west by New River. The General Plan land use designation for the project site is Government/Special Public and in the immediate vicinity of the project site land uses include low-density residential and neighborhood commercial. Sensitive receptors (i.e., residential homes) are approximately 50 feet from the property line. Construction noise varies depending on construction activities and duration, type of equipment involved, proximity to sensitive receptors, and the duration of the construction activities. Construction equipment used on the site may be mobile (e.g., loaders, graders, dozers) or stationary (e.g., air compressor, generator, concrete saw). Heavy construction equipment typically operates for short periods at full power followed by extended periods of operation at lower power, idling, or powered-off conditions.

Construction equipment with diesel engines typically generate maximum noise levels from 80 to 90 dB(A) Leq at a distance of 50 feet (Federal Highway Administration [FHWA] 2006). During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Thus, average hourly noise levels would be less than maximum noise levels.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE Would the project result in:				
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 groundbourne 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?	☐	☐	☐	☒

(Sources: Imperial County Code of Ordinances, 2018; Dudek, SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010).

Less Than Significant Impact: Criteria XIIIa – XIIIb

Construction activities at the SCWD WWTP are expected to cause temporary increases in ambient noise levels at nearby residential noise receivers near New River Boulevard. Construction equipment that are anticipated during construction at the project site are shown in Table 3-13 below:

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time. As noted above, residential receptors are located approximately 50 feet from the project boundary. Imperial County General Plan Noise Element Section IV.C.3 addresses noise generated by construction activities. It states:

> Construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dB Le, when averaged over an eight (8) hour period, and measured at the nearest sensitive receptor. This standard assumes a construction period, relative to an individual sensitive receptor of days or weeks. In cases of extended length construction times, the standard may be tightened so as not to exceed 75 dB Leq when averaged over a one (1) hour period.
>
> Construction equipment operation shall be limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays.

The project is anticipated to be constructed occur over an approximate period of 15 months, and would include phases such as mobilization, clearing and grubbing, excavation and fill, grading, trenching, construction of concrete slabs, construction of a new building, installation of treatment equipment and appurtenances, paving, and start-up which will require temporary use of some heavy construction equipment (i.e., backhoes and dump trucks). Construction activities for will be carried out in phases, with some overlap of activities. During each stage of construction, there would be a different mix of equipment operating, and noise levels would vary based on the amount of equipment in operation and the location at which the equipment is operating. Pile driving, which has the highest potential of generating noise impacts, is not anticipated.

Typical construction noise levels at a distance of 50 feet are shown in **Table 3-13** and **Table 3-14** (the former is limited to the types of equipment anticipated for construction of the project).

Table 3-13 Noise Emission Limits for the Project's Anticipated Construction Equipment at 50 ft

Construction Equipment	Lmax Level (dBA)[1,2]
Arc Welder	73
Backhoe	80
Dump Truck	84
Compressor (air)	70
Concrete Mixer	85
Concrete Pumps	82
Vibratory Compactor	80
Concrete Vibrator	80
Paver	85
Grader	85
Paver	85
Vibratory Concrete Mixer	80
Concrete Pump	82

Source: Mitigation of Nighttime Construction Noise, Vibrations and Other Nuisances, National Cooperative Highway Research Program, 1999.

1. Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant
2. Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation

Table 3-14: Typical Ranges of Construction Noise Levels at 50 Feet, Leq (dBA)

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	84
Excavation	88	75	89	79	88	78
Foundations	81	81	78	78	88	88
Erection	81	65	87	75	79	78
Finishing	88	72	89	75	84	84

I – All pertinent equipment present at site

II – Minimum required equipment present at site

Source: USEPA, Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Thus, average hourly noise levels would be less than maximum noise levels. Hourly average noise levels due to construction activities during busy construction periods for projects involving these stages typically range from about 75 to 87 dBA Leq at a distance of 50 feet. However, construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Noise sources will not be located at the property line and equipment location within the approximately 14-acres of site over which the project would take place would vary by construction phase. The Project site and the area surrounding the site are relatively flat, so no attenuation from barriers and topography are assumed.

Data for Existing 24-Hour Ambient Noise Levels at the project site were not collected. Due to the size of the site, types of proposed activities and equipment, as well as the temporary duration of the project,

construction noise levels are generally anticipated to comply with 75 dB(A) Leq 8-hr noise level limit established by County Noise Element. However, due to the short distance between the site and sensitive receptors, and absent ambient noise data or noise modeling, it is possible that during some construction phases residences in the project vicinity would be exposed to construction noise levels above the 75 dBA Leq 8-hour and/or 1-hour averages. This would likely occur during excavation and grading activities for an approximate duration of weeks. To avoid potentially significant impacts, the following construction best management practices would reduce construction noise levels emanating from the site and minimize disruption and annoyance at existing noise-sensitive receptors in the project vicinity:

- Construct temporary noise barriers, where feasible, to screen stationary noise-generating equipment. Temporary noise barrier fences would provide a 5 dBA noise reduction if the noise barrier interrupts the line-of-sight between the noise source and receiver and if the barrier is constructed in a manner that eliminates any cracks or gaps
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Strictly prohibit unnecessary idling of internal combustion engines
- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as possible from sensitive receptors. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used reduce noise levels at the adjacent sensitive receptors. Any enclosure openings or venting shall face away from sensitive receptors.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- Locate material stockpiles, as well as maintenance/equipment staging and parking areas, as far as feasible from receptors.
- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with adjacent residential land uses so that construction activities can be scheduled to minimize noise disturbance.
- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

With implementation of the above noise control measures, impacts are anticipated to be less than significant.

Any increases in noise during operation of the proposed project would be nominal as operations would be similar to current operations at the site and would comply with the operational noise level limits set forth in Imperial County's Noise Ordinance (**Table 3-15).** Therefore, it is anticipated there would be a less than significant impact to operational noise due to the project.

Table 3-15: Imperial County Property Line Noise Limits

Zone	Time	One Hour Average Sound Level [dB(A) Leq]
Low Density Residential Zones	7:00 a.m. to 10:00 p.m.	50
	10 p.m. to 7:00 a.m.	45
Medium to High-Density Residential Zones	7:00 a.m. to 10:00 p.m.	55
	10 p.m. to 7:00 a.m.	50
Commercial Zones	7:00 a.m. to 10:00 p.m.	60
	10 p.m. to 7:00 a.m.	55
Manufacturing/Light Industrial/Industrial Park Zones including agriculture	(anytime)	70
General Industrial Zones	(anytime)	75

Source: Imperial County Noise Abatement and Control Ordinance, Title 9, Div 7, Section 90702.00(A)
dB(A) Leq = weighted decibels equivalent noise level

Table 3-16 presents typical vibration levels that could be expected from construction equipment at distances of 20 feet under a wide range of soil conditions. Construction activities, such as drilling, the use of jackhammers, rock drills are not anticipated, and therefore would be less than the PPV shown in the table. However, some vibratory equipment and rolling stock equipment (tracked vehicles, compactors, etc.) may also potentially generate substantial vibration in the immediate vicinity. Erection of the building structure is not anticipated to be a source of substantial vibration with the exception of sporadic events such as dropping of heavy objects, which should be avoided to the extent possible.

Table 3-16: Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity (PPV) at 25 Feet (inches per second)
Vibratory Roller	0.21
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Rock Breaker	0.082
Jackhammer	0.035
Small Bulldozer/Tractor	0.003

Source: Transit Noise and Vibration Impact Assessment Manual, USDOT Federal Transit Administration, 2018

Potential increases in groundborne vibration levels attributable to the proposed project would primarily be associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As discussed above, no pile driving is proposed.

The Caltrans recommended standard with respect to the prevention of structural damage for residential structures is between 0.3 and 0.5 inches per second maximum particle velocity (PPV) for continuous/frequent intermittent equipment that may be used during construction of the proposed project (Table 3-17). This is also the range at which vibrations may begin to annoy people in buildings. Therefore, groundborne vibration levels would be considered significant if predicted short-term construction or long-term operational groundborne vibration levels attributable to the proposed Project would exceed 0.3 inches per second PPV at the nearest offsite existing structure.

Table 3-17Guideline Vibration damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (inches/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Transportation and Construction Vibration Guidance Manual, Caltrans, 2020

As previously noted, the nearest off-site structure to the Project site 50 feet from the site boundary. Based on the vibration levels presented in Table 3-15, ground vibration generated by vibratory rollers would be anticipated to exceed approximately 0.2 inches/second PPV at 25 feet. While this vibration would be further diminished at 50 ft, this PPV added to other vibratory or heavy-duty equipment that may be used on-site simultaneously may cause a significant adverse impact to the nearest sensitive receptors. Therefore, the below BMP's will be implemented:

- Avoid vibratory rollers and packers near sensitive areas.
- Phase demolition, earth-moving, and ground-impacting operations so as not to occur in the same time period. Unlike noise, the total vibration level produced could be substantially less when each vibration source operates separately.

Mitigation NOI-1 is proposed to further ensure impacts would be less than significant. No significant increase in groundborne vibration is anticipated during operations. With the proposed BMP's and mitigation in place, groundborne vibration impacts would be considered less than significant.

No Impact: Criteria XIIIc

The closest airport or private airstrip is approximately 10 miles from the project site. No impacts will occur.

MITIGATION MEASURES

NOI 1: A vibration monitoring plan shall be developed, and a compliance monitoring program implemented during construction

XIV. POPULATION AND HOUSING

SETTING

The SCWD had an approximate population of 2,100 people as of 2017. It is designated as an urban area by the Imperial County Land Use Plan and consists of mostly low residential and neighborhood commercial land uses as shown in Figure 3-8.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING				
Would the Project:				
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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

(Source: Seeley County Water District Service Area Plan, 2017; Hazen and Sawyer: USDA Preliminary Engineering Report, 2021; US Census Bureau for Population 1990, 2000, 2010; U.S. Census Bureau 2017 American Community Survey (ACS)).

No Impact: Criterion XVIa

Based on conservative estimates of growth in SCWD's service area (a modest 2.08% annual growth rate based on prior estimates by SCWD), the existing population of 2,100 is estimated to increase to 3,111 by the year 2035. With the project, the new flowrate through the WWTP will be an average of 0.15 mgd, closer to the current levels of average daily flows (0.11 mgd). Therefore, the project will provide an additional 30 percent capacity above current conditions to accommodate the project increase in population through 2035. The project would not provide additional utilities or WWTP capacity that would trigger or induce more rapid growth in the SCWD the community of Seeley. As a result, the proposed project would not induce unplanned growth, either directly or indirectly.

No Impact: Criterion XVIb

Existing communities and houses will not be displaced as part of the project since construction activities will only occur at the existing WWTP project site. No impact is anticipated.

MITIGATION MEASURES

None.

XV. PUBLIC SERVICES

SETTING

The SCWD WWTP is a government/special public land use and is an urban area as designated by the Imperial County Land Use Plan. There is residential housing immediately east of the New River Boulevard, which would be located less than 100 feet from the WWTP property boundary. The community of Seeley is served by Station 3 of the Imperial County Fire Department which responds to fires, medical emergencies, motor vehicle accidents, rescue calls and incidents involving hazardous materials. The area is also served by the Imperial County Sheriff's Office. The Seeley Elementary School is located around 2,000 feet east of the project site. Seeley is surrounded by vacant lands and the New River is located west of the project site. However, no agricultural lands, wilderness areas, or recreational areas occur on the project site and there are no recreational areas located within 1,000 feet of the project site. Sunbeam Lake Park, a 117-acre County-maintained regional park south of Seeley near Interstate 8 which includes a small lake and lagoon, is located 0.75 miles from the project site.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES				
Would the Project:				
a) 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 would 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?	☐	☐	☐	☒

(Imperial County websites accessed through imperialcounty.org)

No Impact: Criterion XVa

Operation of the project will remain the same as under current conditions – as a WWTP treating wastewater from the surrounding sewer network and septage deliveries. There will be no change in the

number of personnel onsite once the project is constructed. Construction activities will not impact recreational areas including but not limited to: neighborhoods, regional parks, and other recreational suburban and urban areas. Since all construction activities would occur entirely within the boundaries of the WWTP with approximately ten additional workers on site, established communities and services such as fire services, police departments, schools, parks, and other facilities would not be physically affected or need to increase the level of service provided. No growth would be generated as a result of the project and there would be no conflicts with any land use plans or policies, as discussed in Section XI. In addition, all staging areas will be located at the project site and all construction activities will comply with Objective 1.17 within Imperial County's General Plan: Circulation and Scenic Highways Element to ensure that all road systems are adequate to accommodate emergency situations and evacuation plans. Therefore, no impact would occur.

MITIGATION MEASURES

None.

XVI. RECREATION

SETTING

The project site is dedicated to public benefit use (as a WWTP) and is an urban area as designated by the Imperial County Land Use Plan As discussed above, no wilderness areas occur on or adjacent to the project site. Sunbeam Lake Park, a 117-acre County-maintained regional park south of Seeley near Interstate 8 which includes a small lake and lagoon, is located 0.75 miles from the project site. There are no parks or recreational facilities in the immediate vicinity of the project site.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION				
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?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

(Sources: Dudek, SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010, Imperial County General Plan: Parks and Recreation Element, 2008).

No Impact: Criteria XVIa, XVIb

Construction activities associated with the project will not impact any recreational areas since all construction activities would occur entirely within the boundaries of the WWTP. Likewise, there are no recreational facilities that would be affected by operation of the project. The project will not increase or alter the use of the Sunbeam Regional Park. Therefore, no impact would occur.

MITIGATION MEASURES

None.

XVII. TRANSPORTATION AND TRAFFIC

SETTING

The project site is served by collector and arterial streets. Collector and arterial streets are generally low-to-medium speed and low-to-medium capacity roadways that provide connections between neighborhood areas, commercial centers, and regional highways. Access to the project site, including emergency access, is provided via local roadways.

The SCWD WWTP is located at 1898 West Main Street in Seeley, California. The main access road to arrive at the WWTP is New River Boulevard which is accessed off of the Evan Hewes Highway. Evan Hewes Highway connects to the Interstate 8 Highway via Drew Road, approximately 0.6 miles west of the project site. No public transportation facilities, airports, railroads, or bicycle and pedestrian facilities are located in the vicinity of the project site and transportation in the area is by cars on the surrounding local roadway network.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. TRANSPORTATION/TRAFFIC Would the Project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (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)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

(Sources: Dudek, SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010).

No Impact: Criterion XVIIa

The project does not represent a land use that generates or attracts vehicle trips and would not be expected to impact the performance of the existing transportation system. There are no existing or planned bicycle

or transit facilities located at or adjacent to the project site. The Imperial County General Plan includes a Circulation and Scenic Highways element. The goals of this element are to: provide an integrated transportation system for the safe and efficient movement of people and goods; develop a circulation system that includes multiple modes of transportation; develop alternate transportation strategies to reduce traffic volumes; highlight and preserve the environmental and scenic amenities of the area; and participate in and assist with regional transportation efforts. The project will not impact the ability of Imperial County to meet these goals. No impact would occur.

Less than Significant Impact: Criterion XVIIb

CEQA Guidelines Section 10564.3 subdivision (b) stipulates criteria for analyzing transportation impacts in terms of "vehicle miles traveled" for land use projects and transportation projects. VMT refers to the amount and distance of automobile travel attributable to a project.

Once construction is complete and the project is operational, traffic to and from the site will be similar to existing conditions. Maintenance of the new MBR treatment system and sludge drying beds are anticipated to result in a very minor increase in yearly traffic due to additional chemical deliveries (i.e., sodium hypochlorite, citric acid, and polymer), additional maintenance deliveries, and sludge removal and disposal. Five SCWD personnel are anticipated to be onsite each day, the same as under existing conditions.

During construction, the number of trucks and workers would vary onsite over the one-year construction period. As shown in Table 318, approximately two trucks would visit the site per day along with 10 construction workers. This nominal increase in traffic during both construction and operation of the proposed project is consistent with use as a utility/infrastructure site, would not interfere with the surrounding residential land use, and would not result in an increase in VMT that would exceed thresholds of significance. The increase in VMT generated during operation of the project would be minimal. Therefore, the project would have a less than significant impact on the CEQA Guidelines 15064.3, subdivision (b).

Table 318: Anticipated Construction Trip Generation (2023)

	1st Quarter (Jan – Mar)	2nd Quarter (Ap – Jun)	3rd Quarter (Jul – Sep)	4th Quarter (Oct – Dec)
Trucks per day/ month	2	2	2	3
Trucks per quarter	6	6	6	9
Truck Type	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)	Tractor/Loader (2 axle)
Workers per day	10	10	10	10

No Impact: Criteria XVIIc, XVIId

The project will not involve construction of or on public roadways or the use of oversized equipment that would travel on local roadways. Emergency access will be provided via West Main Street and New River Boulevard. The project is not anticipated to create emergency access issues. No impact would occur.

MITIGATION MEASURES

None.

XVIII. TRIBAL AND CULTURAL RESOURCES

SETTING

SCWD is located at the USGS Seeley 7.5 Minute Quadrangle as shown in Figure 3-11. According to the Native American Heritage Commission (NAHC), tribal, cultural, and religious resources that belong to Kumeyaay-affiliated tribes exist within this geographic area. However, As shown in Figure 3-12, from the Imperial County General Plan, the project site is not located on or adjacent to known areas of Native American cultural sensitivity.



Figure 3-11: USGS 7.5 Minute Quadrangle

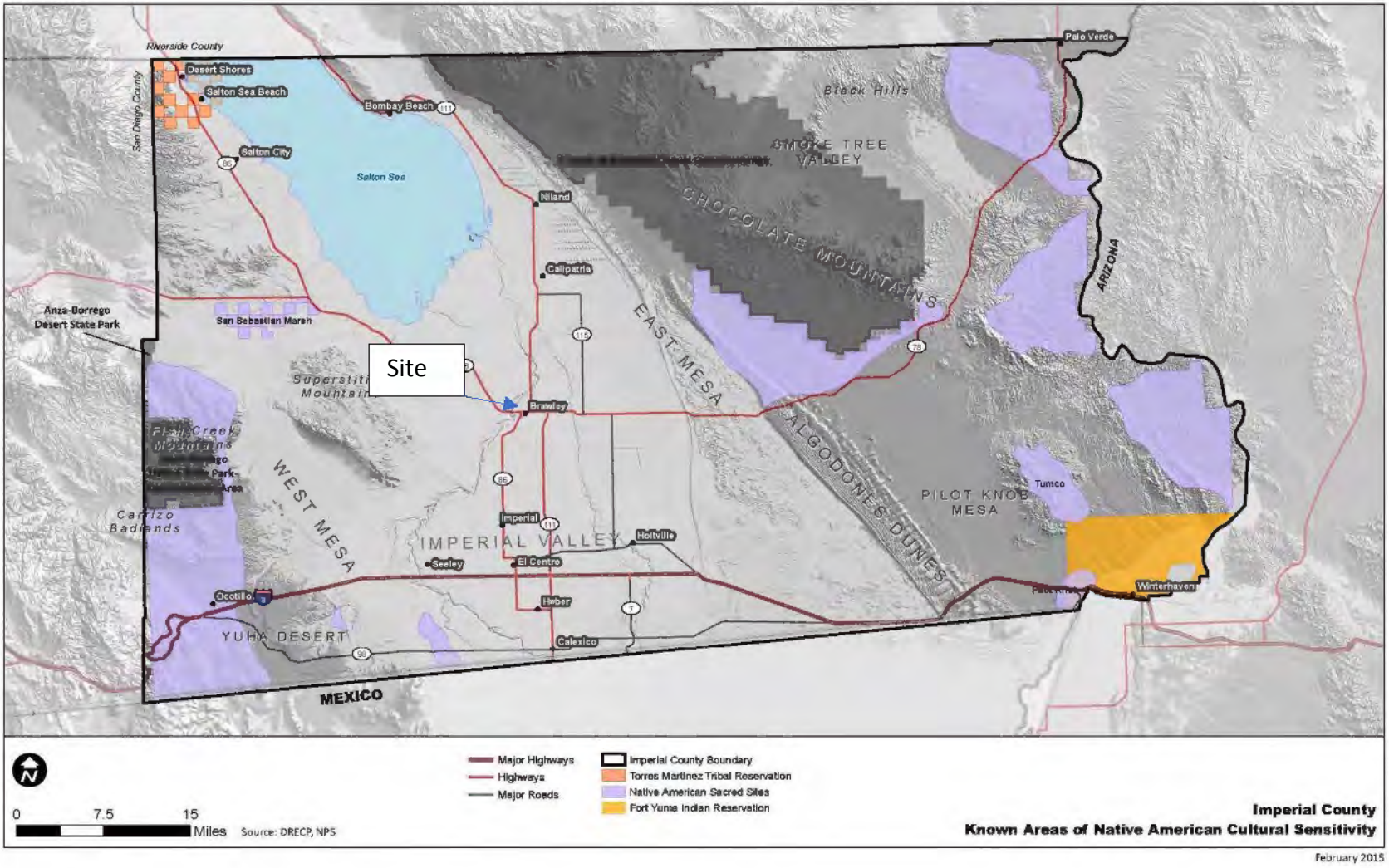


Figure 3-12: Imperial County Known Areas of Native American Cultural Sensitivity

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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:				
a) 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	☐	☒	☐	☐
b) 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 Resource Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

(Sources: South Coastal Information Center: Cultural Resources Records Search, 2021; Native American Heritage Commission Correspondence, 2021; Imperial County General Plan: Conservation and Open Space Element, 2016; Dudek, SES Solar Two, LLC: Seeley Wastewater Reclamation Facility Improvements, 2010; URS: Additional Information Related to the Seeley Wastewater Reclamation Facility Improvements Application for Certification (08-AFC-5) Imperial Valley Solar, LLC, 2010).)

Less Than Significant with Mitigation Incorporated: Criteria XVIIIa, XVIIIb

As discussed in Section V, Cultural Resources, SCIC found records of only three cultural resources within a half-mile radius of the project area (all three of which are historic structures). In addition, a cultural resources record search and pedestrian survey were conducted in 2009 by Dudek as part of a Draft IS/MND conducted as part of the Imperial Valley Solar Project. No cultural resources were identified on the project site as part of that survey. In addition, SCWD is currently initiating consultation with local Tribes under the requirements of AB52 and will take actions necessary to ensure the protection of tribal and cultural resources. Finally, mitigation measure CUL-1 provides for the presence of a Tribal monitor during ground disturbing activities for the proposed project. The monitor is qualified to identify a resource and recommend how it is to be handled, whether through excavation and curation, or preservation in place, and would make those recommendation if resources are encountered. With the

AB52 Consultation and the CUL-1 mitigation measure in place, impacts to tribal resources as a result of the project will be less than significant.

MITIGATION MEASURES

See Section V, Cultural Resources (CUL-3)

XIX. UTILITIES AND SERVICE SYSTEMS

SETTING

The WWTP is located at 1898 West Main Street in Seeley, California. As stated, the WWTP has a maximum permitted capacity of 0.25 MGD. The WWTP was constructed in 1965 and services an area of approximately 2.26 square miles and a population of approximately 2,100 residents. No major expansions have taken place since the plant's construction, which currently operates at an influent average of 0.11 MGD. The project is served by existing water, power, and telecommunication facilities. Water is supplied by SCWD. The source of the water supplied by SCWD is surface water from the IID– Elder Canal Gate 94D that is obtained from the All-American Canal bringing water from the Colorado River at Imperial Dam to Imperial Valley. Water quality is regulated by the USEPA and State Water Resources Control Board. Stormwater onsite infiltrates into the sandy soils onsite. Power to the site is provided by the IID and is supplied locally using a mix of hydroelectric facilities, a steam generating facility, several gas turbines and a diesel unit. Solid waste generated at the site (both employee refuse and solids generated by the treatment process) are hauled offsite for disposal in accordance with all applicable regulations.

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS Would the Project:				
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 telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
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?	☐	☐	☒	☐
d) 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?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

(Sources: Hazen and Sawyer: USDA Preliminary Engineering Report, 2021, http://www.ivedc.com/business/utilities/).

Less than Significant Impact: Criterion XIXa

The WWTP is located in a FEMA Flood Zone X, defined as a minimal flood hazard area. The change in impervious area onsite due to the project will be increase by approximately 4% (from 22% to 28% impervious cover) and the proposed stormwater management plan, which will redirect stormwater from impervious to pervious areas onsite, will be adequate to handle stormwater. While the project includes upgrades to existing electrical equipment, the total increase in energy will be 1200A as compared to existing conditions and can be handled by the local energy grid. No changes to telecommunications are included in the project. Therefore, it is anticipated the project will have a less than significant impact on facilities that provide existing utility services onsite.

No Impact: Criterion XIXb

Implementation of the project will not result in new or expanded water supply sources or in changes to water supplied to the SCWD service area. The number of staff onsite will not change once the project is complete and therefore, there will not be an increased demand for water at the project site. In addition, the project is consistent with existing demand projections contained in SCWD's service area plan (which are based on the allowed land uses for the project site). No impact would occur.

Less than Significant Impact: Criterion XIXc

Construction of the project would not interrupt existing sewer service to the WWTP or other surrounding uses since operation of the WWTP will continue through construction. No significant increase in demand for wastewater disposal or treatment will be created by the project compared to current conditions. This purpose of the project is to ensure compliance with SCWD's NPDES permit through upgrades to the treatment process onsite. Construction of the MBR system, sludge drying beds, mechanical dewatering system, and addition of new pumping and piping will require minor excavation, some demolition of dense brush, and paving and grading that will not generate large quantities of solid waste. Leftover soil from excavation and demolition will be re-used on-site.

As of 2017, the WWTP in Seeley operates at 45% capacity, thus the project would not exceed the 0.25 MGD wastewater treatment capacity by the wastewater treatment provider which serves the project. The WWTP is being resized closer to its current capacity while still ensuring treatment of future increases in flow based on projected growth in the area. Should future developments, such as Sunbeam Estates, be connected to the SCWD service area at a later date, the developers would be required to construct all necessary upgrades to the WWTP necessary to ensure adequate capacity to treat associated increases in flow. Therefore, it's anticipated the project will have a Less than significant impact on SCWD's ability to treat wastewater from its collection system and septage deliveries.

Less Than Significant Impact: Criteria XIIId, XIIIe

Solid waste will be generated during project construction and operation. Construction debris and waste generated at the project site would be transported to an appropriate facility, which would have sufficient permitted capacity to accept construction waste generated by the project.

Long-term operation of the WWTP includes treatment that will generate solid waste:

- The first solid waste steam is the solids collected from the septage receiving station. The solids are manually removed from the bar screens and loaded into dumpsters. The solids in the dumpster are taken to a local landfill. There is no anticipated change in the quantity of solids that will be generated once the project is operation.
- Solids from the existing operations building are co-mingled with solid waste from the septage receiving station and taken to a local landfill. There will be no change in personnel onsite once the project is operational and the quantity of refuse is anticipated to remain unchanged from existing conditions.
- Solids in wastewater entering the influent lift station are pumped to Pond 2 where they are allowed to settle and accumulate. The solids in the pond are periodically removed, dried and

hauled to a landfill. The quantity of solids in the incoming wastewater will not be affected by the project.

- The new MBR system will generate quantities of sludge that will be mechanically dewatered and dried in drying beds. Ultimately the dried solids will be hauled to a local landfill. No impacts are anticipated to occur that would exceed the designated landfill's solid waste capacity.

The project will also comply with all Federal, State, and local statutes and regulations related to solid waste. The project would not result in generation of significant solid waste streams, nor would it generate or require the transport of hazardous waste materials. All demolition activities would comply with any SCWD requirements for diversion of both construction waste during the demolition phase and solid waste during operation. No activities that would violate solid waste regulations are proposed or expected to occur. Therefore, the project will have a less than significant impact on solid waste.

MITIGATION MEASURES

None.

XX. WILDFIRE

SETTING

The project site is located within the western side of Imperial County's Local Responsibility Area (LRA) indicating that the area must be reviewed by Imperial County to determine its fire hazard severity zone as defined by the California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program (FRAP). As shown below in Figure 313, the project site is designated as a non-VHFHSZ.



Figure 3-13: Fire Hazard Severity Zones at SCWD

IMPACT ANALYSIS

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
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 a 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 risks, including downslope or downstream flooding or landslides, and as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

(Sources: California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program (FRAP) Fire Hazard Severity Zone Viewer, accessed October 12th, 2021)

No Impact: Criterion XXa - XXc

Construction activities for the proposed project will not impact any emergency response plan or emergency evacuation plans set forth by Imperial County. All staging areas will be located at the project site and all construction activities will comply with Objective 1.17 within Imperial County's General Plan: Circulation and Scenic Highways Element to ensure that all road systems are adequate to accommodate emergency situations and evacuation plans. Operation of the project will not result in any interference with emergency response plans or evacuation plans.

The proposed project is located within an LRA designated as non-VHFHSZ. Thus, the project will not exacerbate wildfire risks nor expose project occupants to pollutant concentrations from a wildfire or uncontrolled spread of a wildfire.

The proposed project will involve the construction of new facilities on-site including an MBR treatment area, a new operations building with a standby generator and utility transformer, new sludge drying beds, a new lagoon pump station that will connect to the MBR treatment area, and a new mechanical

dewatering area. There will also be new piping connections for drainage purposes from the sludge drying beds and there will also be surface water connections for the MBR, mechanical dewatering, and sludge drying bed areas. However, installation, maintenance and operation of this proposed infrastructure will not exacerbate fire risk. No new chemicals which would be stored onsite are combustible, sodium hypochlorite is a strong oxidizer which enhances the combustion of other substances. This chemical will be stored away from potential fire hazards. Operational activities that would occur once a month would also not exacerbate fire risk. Therefore, no impact to fire risk would occur.

No Impact: Criterion XXd

Proposed grading at the site will be minimal since the project area is generally flat. The proposed stormwater management measures at the site involve grading impermeable surfaces to direct water to permeable areas where stormwater can infiltrate. These general drainage patterns will comply with local, regional, and state regulations. The project site is relatively flat and there is limited vegetation therefore, erosion is not a concern. Thus, the proposed project will not expose people or structures to significant risks as a result of post-fire slope instability or drainage changes.

MITIGATION MEASURES

None.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

SETTING

IMPACT ANALYSIS

NOTE: If there are significant environmental impacts which cannot be mitigated and no feasibleproject alternatives are available, then complete the mandatory findings of significance and attach to this initial study as an appendix.

RESOURCE CATEGORY / SIGNIFICANCE CRITERIA	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to substantially degrade the quality of the environment, 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, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Less than Significant Impact with Mitigation Incorporated: Criterion XXIa-c

Geology and Soils

As described in Section VII, impacts to paleontological resources could be significant but mitigation measures have been included in consideration of findings of any paleontological resources conducted by a qualified paleontologist. Mitigation measures GEO-1 have been included in the event of any paleontological resource discovery during excavation.

Cultural Resources

As described in Section V, impacts to cultural resources could be significant but mitigation measures have been included in consideration of the findings from the archival research and field study conducted by a qualified archaeologist. Mitigation measures CUL 1 and CUL 2 have been included in the event of an accidental discovery. The project also requires tribal monitoring (CUL 3) to be present during ground disturbing activities, pending additional responses from affected tribes. Further, mitigation measure CUL 4 is included should any remains be encountered on the project site.

Tribal Cultural Resources

As described in Section V and Section XVIII, impacts to tribal cultural resources could be significant but mitigations measures have been put in place, such as CUL 3, to protect cultural resources during construction. A Tribal monitor will be present during ground disturbing activities to identify any potential cultural resources and handle them appropriately.

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INITIAL STUDY/ NEGATIVE DECLARATION
Seeley County Water District Wastewater Treatment Plant Improvements

Appendix A: CalEEMod 2020.4.0 Air Quality and GHG Modeling Results

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Seeley County Water District Wastewater Treatment Improvements Project

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	42.00	1000sqft	0.96	42,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2024
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	189.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - *construction land use will be around 40,000 sqft but extra 2,000 will be for removal of dense brush, etc.

Construction Phase - *Construction will take approximately a year to complete with facility installation taking the longest.

Off-road Equipment - *Only 1 two-axle crawler type backhoe is needed to clear and grub project site and remove dense brush/trees.
*Air Compressor will be used to move debris and inflate tires as needed.

Off-road Equipment - *Graders only for 6 hrs/day. Only 1 roller will be used. 2 backhoes needed to excavate/dig foundations for facility/equipment.
*OCE = Pickup Truck used for 8 hrs/day at 280 hp with 0.4 LF (these are avgs for pickup trucks).
*Off-Highway truck = Dump Truck at 350 hp (avg). 1 stationary flat bed will be used.

Off-road Equipment - *1 arc welder will be used for 6 hrs/day as needed. 1 pickup truck will be used as needed.
1 concrete mixer, 1 concrete pump, and 1 concrete vibrator with 2.5 hp will be used.

Off-road Equipment - *1 pickup truck and 1 dump truck will be used. Dump truck = off-higway truck with 350 avg hp.
*backhoes, arc welder, concrete mixers/pump/vibrator, compressor, and flatbed that are mentioned
in other sections will be used here if needed. No additional backhoes will be added. 3 backhoes total.

Grading - *only a total of around 15,000 sqft will be graded or 0.344 acres, so it will be rounded up
to be conservative.

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Off-road Equipment - *1 additional pickup truck will be used here (4 total pickup trucks for cons. phase).
*Arc welder, compressor, concrete mixer/pump/vibrator, flatbed, and dump trucks
will be used as needed her. No need to add any additional equipment from these
categories. Things like cranes, forklifts, generators, etc not used.

Off-road Equipment - *Graders, paving equipment, roller, flatbed, compressor,
dump or pickup truck will be re-used here. No additional
equipment that has already been mentioned will be added.

Demolition - 2

Trips and VMT - *no equipment or debris from brush is anticipated to be hauled off-site.
*only sludge will be hauled off-site onto a landfill but during operations.
*There will be 5 trips per phase except paving/grading since there is no
overlap with other phases in paving and grading.

Mobile Commute Mitigation -

Vehicle Trips - *Project site is only 0.2 of a mile long so trip lengths in miles on-site for operational
purposes should not be long. Operations are not expected on weekends, but low
trip rates were added to the weekend to be conservative.

Operational Off-Road Equipment - *Two SU-30 one axle haul/dump trucks will come in. 1 to haul solid waste and 1 comes in to dump waste once a month

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	15.00
tblConstructionPhase	NumDays	100.00	111.00
tblConstructionPhase	NumDays	10.00	15.00
tblConstructionPhase	NumDays	100.00	46.00
tblConstructionPhase	NumDays	100.00	59.00
tblConstructionPhase	NumDays	1.00	45.00
tblConstructionPhase	PhaseEndDate	3/20/2023	11/22/2023
tblConstructionPhase	PhaseEndDate	6/6/2022	7/10/2023
tblConstructionPhase	PhaseEndDate	1/14/2022	12/23/2022
tblConstructionPhase	PhaseEndDate	10/24/2022	8/14/2023
tblConstructionPhase	PhaseEndDate	3/13/2023	11/3/2023
tblConstructionPhase	PhaseEndDate	1/17/2022	3/10/2023
tblConstructionPhase	PhaseStartDate	3/14/2023	11/2/2023
tblConstructionPhase	PhaseStartDate	1/18/2022	2/6/2023
tblConstructionPhase	PhaseStartDate	1/3/2022	12/5/2022

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	PhaseStartDate	6/7/2022	6/12/2023
tblConstructionPhase	PhaseStartDate	10/25/2022	8/15/2023
tblConstructionPhase	PhaseStartDate	1/15/2022	1/9/2023
tblGrading	AcresOfGrading	16.88	0.50
tblOffRoadEquipment	HorsePower	172.00	280.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	HorsePower	172.00	2.50
tblOffRoadEquipment	HorsePower	231.00	97.00
tblOffRoadEquipment	HorsePower	172.00	280.00
tblOffRoadEquipment	HorsePower	172.00	280.00
tblOffRoadEquipment	HorsePower	172.00	280.00
tblOffRoadEquipment	HorsePower	402.00	350.00
tblOffRoadEquipment	LoadFactor	0.42	0.40
tblOffRoadEquipment	LoadFactor	0.42	0.10
tblOffRoadEquipment	LoadFactor	0.29	0.37
tblOffRoadEquipment	LoadFactor	0.42	0.40
tblOffRoadEquipment	LoadFactor	0.42	0.40
tblOffRoadEquipment	LoadFactor	0.42	0.40
tblOffRoadEquipment	OffRoadEquipmentType		Tractors/Loaders/Backhoes
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Concrete/Industrial Saws	Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Cranes
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Rollers
tblOffRoadEquipment	OffRoadEquipmentType	Cranes	Other Construction Equipment

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentType	Cranes	Welders
tblOffRoadEquipment	OffRoadEquipmentType	Cranes	Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Forklifts	Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Forklifts	Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	12.00
tblOperationalOffRoadEquipment	OperHorsePower	402.00	350.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	6.00
tblOperationalOffRoadEquipment	OperLoadFactor	0.38	0.38
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	9.00	0.00
tblTripsAndVMT	VendorTripLength	8.90	0.00
tblTripsAndVMT	VendorTripLength	8.90	0.00
tblTripsAndVMT	VendorTripLength	8.90	0.00
tblTripsAndVMT	VendorTripLength	8.90	8.00
tblTripsAndVMT	VendorTripLength	8.90	0.00
tblTripsAndVMT	VendorTripLength	8.90	0.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	VendorTripNumber	7.00	4.00
tblTripsAndVMT	VendorTripNumber	7.00	0.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripLength	7.30	5.00
tblTripsAndVMT	WorkerTripNumber	18.00	5.00
tblTripsAndVMT	WorkerTripNumber	18.00	5.00
tblTripsAndVMT	WorkerTripNumber	18.00	5.00
tblTripsAndVMT	WorkerTripNumber	18.00	5.00
tblTripsAndVMT	WorkerTripNumber	0.00	4.00
tblVehicleTrips	CC_TL	5.00	0.50
tblVehicleTrips	CNW_TL	8.90	0.50
tblVehicleTrips	CW_TL	6.70	0.50
tblVehicleTrips	ST_TR	1.99	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblVehicleTrips	SU_TR	5.00	1.00
tblVehicleTrips	WD_TR	4.96	5.00

2.0 Emissions Summary

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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					
2022	0.4514	3.5619	4.7391	7.2300e-003	18.5431	0.1992	18.7423	1.8594	0.1920	2.0513	0.0000	692.7913	692.7913	0.1229	7.6000e-004	696.0903
2023	2.4956	22.9175	20.9734	0.0605	60.3913	0.9098	61.3011	6.0343	0.8370	6.8714	0.0000	5,862.9519	5,862.9519	1.8599	0.0136	5,913.4881
Maximum	**2.4956**	**22.9175**	**20.9734**	**0.0605**	**60.3913**	**0.9098**	**61.3011**	**6.0343**	**0.8370**	**6.8714**	**0.0000**	**5,862.9519**	**5,862.9519**	**1.8599**	**0.0136**	**5,913.4881**

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					
2022	0.4514	3.5619	4.7391	7.2300e-003	0.1472	0.1992	0.3463	0.0237	0.1920	0.2156	0.0000	692.7913	692.7913	0.1229	7.6000e-004	696.0903
2023	2.4956	22.9175	20.9734	0.0605	0.0525	0.9098	0.9622	0.0133	0.8370	0.8503	0.0000	5,862.9519	5,862.9519	1.8599	0.0136	5,913.4881
Maximum	**2.4956**	**22.9175**	**20.9734**	**0.0605**	**0.1472**	**0.9098**	**0.9622**	**0.0237**	**0.8370**	**0.8503**	**0.0000**	**5,862.9519**	**5,862.9519**	**1.8599**	**0.0136**	**5,913.4881**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	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**	**99.75**	**0.00**	**98.37**	**99.53**	**0.00**	**88.05**	**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	1.0592	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003
Energy	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672
Mobile	0.3420	0.2370	1.5248	1.0400e-003	36.7139	1.3500e-003	36.7152	3.6638	1.2500e-003	3.6651		107.7556	107.7556	0.0310	0.0171	113.6339
Offroad	0.6523	4.3678	4.2659	0.0174		0.1573	0.1573		0.1447	0.1447	0.0000	1,680.4599	1,680.4599	0.5435		1,694.0473
Total	**2.0936**	**4.9696**	**6.1014**	**0.0206**	**36.7139**	**0.1864**	**36.9002**	**3.6638**	**0.1737**	**3.8375**	**0.0000**	**2,225.8911**	**2,225.8911**	**0.5829**	**0.0252**	**2,247.9582**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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	lb/day										lb/day					
Area	1.0592	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003
Energy	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672
Mobile	0.3420	0.2370	1.5248	1.0400e-003	36.7139	1.3500e-003	36.7152	3.6638	1.2500e-003	3.6651		107.7556	107.7556	0.0310	0.0171	113.6339
Offroad	0.6523	4.3678	4.2659	0.0174		0.1573	0.1573		0.1447	0.1447	0.0000	1,680.4599	1,680.4599	0.5435		1,694.0473
Total	**2.0936**	**4.9696**	**6.1014**	**0.0206**	**36.7139**	**0.1864**	**36.9002**	**3.6638**	**0.1737**	**3.8375**	**0.0000**	**2,225.8911**	**2,225.8911**	**0.5829**	**0.0252**	**2,247.9582**

	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	Demolition	Demolition	12/5/2022	12/23/2022	5	15	
2	Site and Yard Preparation	Site Preparation	1/9/2023	3/10/2023	5	45	
3	Equipment Installation	Building Construction	2/6/2023	7/10/2023	5	111	
4	Facility Installation	Building Construction	6/12/2023	8/14/2023	5	46	

5	Piping and Septage System Installation	Building Construction	8/15/2023	11/3/2023	5	59	
6	Paving and Grading	Paving	11/2/2023	11/22/2023	5	15	

Acres of Grading (Site Preparation Phase): 0.5

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

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site and Yard Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site and Yard Preparation	Paving Equipment	1	6.00	132	0.36
Demolition	Air Compressors	1	8.00	78	0.48
Site and Yard Preparation	Other Construction Equipment	1	8.00	280	0.40
Site and Yard Preparation	Off-Highway Trucks	1	8.00	350	0.38
Facility Installation	Pumps	1	8.00	84	0.74
Facility Installation	Other Construction Equipment	1	8.00	2.5	0.10
Site and Yard Preparation	Graders	1	6.00	187	0.41
Demolition	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Equipment Installation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Demolition	Cranes	0	0.00	97	0.37
Facility Installation	Cement and Mortar Mixers	1	8.00	9	0.56
Piping and Septage System Installation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Site and Yard Preparation	Rollers	1	8.00	80	0.38
Paving and Grading	Cement and Mortar Mixers	0	0.00	9	0.56
Piping and Septage System Installation	Other Construction Equipment	1	8.00	280	0.40
Piping and Septage System Installation	Forklifts	0	0.00	89	0.20
Paving and Grading	Pavers	0	0.00	130	0.42

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Paving and Grading	Rollers	0	0.00	80	0.38
Paving and Grading	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Facility Installation	Welders	1	6.00	46	0.45
Equipment Installation	Other Construction Equipment	1	8.00	280	0.40
Facility Installation	Other Construction Equipment	1	8.00	280	0.40
Equipment Installation	Off-Highway Trucks	1	8.00	350	0.38

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
Demolition	2	5.00	0.00	0.00	5.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Site and Yard Preparation	7	5.00	0.00	0.00	5.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Facility Installation	5	5.00	0.00	0.00	5.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Equipment Installation	2	5.00	4.00	0.00	5.00	8.00	0.00	LD_Mix	HDT_Mix	HHDT
Piping and Septage System Installation	1	5.00	0.00	0.00	5.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT
Paving and Grading	0	4.00	0.00	0.00	5.00	0.00	0.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 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					0.1364	0.0000	0.1364	0.0207	0.0000	0.0207			0.0000			0.0000
Off-Road	0.4374	3.5536	4.6561	7.0700e-003		0.1991	0.1991		0.1919	0.1919		676.5030	676.5030	0.1219		679.5495
Total	**0.4374**	**3.5536**	**4.6561**	**7.0700e-003**	**0.1364**	**0.1991**	**0.3354**	**0.0207**	**0.1919**	**0.2125**		**676.5030**	**676.5030**	**0.1219**		**679.5495**

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	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
Worker	0.0140	8.2800e-003	0.0830	1.6000e-004	18.4068	1.1000e-004	18.4069	1.8387	1.1000e-004	1.8388		16.2883	16.2883	1.0500e-003	7.6000e-004	16.5408
Total	**0.0140**	**8.2800e-003**	**0.0830**	**1.6000e-004**	**18.4068**	**1.1000e-004**	**18.4069**	**1.8387**	**1.1000e-004**	**1.8388**		**16.2883**	**16.2883**	**1.0500e-003**	**7.6000e-004**	**16.5408**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Demolition - 2022

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					0.1364	0.0000	0.1364	0.0207	0.0000	0.0207			0.0000			0.0000
Off-Road	0.4374	3.5536	4.6561	7.0700e-003		0.1991	0.1991		0.1919	0.1919	0.0000	676.5030	676.5030	0.1219		679.5495
Total	**0.4374**	**3.5536**	**4.6561**	**7.0700e-003**	**0.1364**	**0.1991**	**0.3354**	**0.0207**	**0.1919**	**0.2125**	**0.0000**	**676.5030**	**676.5030**	**0.1219**		**679.5495**

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	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
Worker	0.0140	8.2800e-003	0.0830	1.6000e-004	0.0108	1.1000e-004	0.0109	3.0300e-003	1.1000e-004	3.1300e-003		16.2883	16.2883	1.0500e-003	7.6000e-004	16.5408
Total	**0.0140**	**8.2800e-003**	**0.0830**	**1.6000e-004**	**0.0108**	**1.1000e-004**	**0.0109**	**3.0300e-003**	**1.1000e-004**	**3.1300e-003**		**16.2883**	**16.2883**	**1.0500e-003**	**7.6000e-004**	**16.5408**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site and Yard Preparation - 2023

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					0.0118	0.0000	0.0118	1.2700e-003	0.0000	1.2700e-003			0.0000			0.0000
Off-Road	1.6671	16.0596	15.1225	0.0381		0.6600	0.6600		0.6072	0.6072		3,688.7107	3,688.7107	1.1930		3,718.5358
Total	**1.6671**	**16.0596**	**15.1225**	**0.0381**	**0.0118**	**0.6600**	**0.6718**	**1.2700e-003**	**0.6072**	**0.6084**		**3,688.7107**	**3,688.7107**	**1.1930**		**3,718.5358**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	18.4068	1.1000e-004	18.4069	1.8387	1.0000e-004	1.8388		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**18.4068**	**1.1000e-004**	**18.4069**	**1.8387**	**1.0000e-004**	**1.8388**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.3 Site and Yard Preparation - 2023

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					0.0118	0.0000	0.0118	1.2700e-003	0.0000	1.2700e-003			0.0000			0.0000
Off-Road	1.6671	16.0596	15.1225	0.0381		0.6600	0.6600		0.6072	0.6072	0.0000	3,688.7107	3,688.7107	1.1930		3,718.5358
Total	**1.6671**	**16.0596**	**15.1225**	**0.0381**	**0.0118**	**0.6600**	**0.6718**	**1.2700e-003**	**0.6072**	**0.6084**	**0.0000**	**3,688.7107**	**3,688.7107**	**1.1930**		**3,718.5358**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	0.0108	1.1000e-004	0.0109	3.0300e-003	1.0000e-004	3.1200e-003		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**0.0108**	**1.1000e-004**	**0.0109**	**3.0300e-003**	**1.0000e-004**	**3.1200e-003**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Equipment Installation - 2023

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	0.7950	6.6862	5.6206	0.0212		0.2482	0.2482		0.2284	0.2284		2,054.9584	2,054.9584	0.6646		2,071.5738
Total	**0.7950**	**6.6862**	**5.6206**	**0.0212**		**0.2482**	**0.2482**		**0.2284**	**0.2284**		**2,054.9584**	**2,054.9584**	**0.6646**		**2,071.5738**

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	0.0000
Vendor	7.6600e-003	0.1569	0.0775	8.3000e-004	23.5660	1.3400e-003	23.5673	2.3556	1.2800e-003	2.3569		87.5627	87.5627	4.0000e-004	0.0122	91.1922
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	18.4068	1.1000e-004	18.4069	1.8387	1.0000e-004	1.8388		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0206**	**0.1643**	**0.1539**	**9.8000e-004**	**41.9728**	**1.4500e-003**	**41.9742**	**4.1944**	**1.3800e-003**	**4.1957**		**103.4228**	**103.4228**	**1.3500e-003**	**0.0129**	**107.2854**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.4 Equipment Installation - 2023

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	0.7950	6.6862	5.6206	0.0212		0.2482	0.2482		0.2284	0.2284	0.0000	2,054.9584	2,054.9584	0.6646		2,071.5738
Total	**0.7950**	**6.6862**	**5.6206**	**0.0212**		**0.2482**	**0.2482**		**0.2284**	**0.2284**	**0.0000**	**2,054.9584**	**2,054.9584**	**0.6646**		**2,071.5738**

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	0.0000
Vendor	7.6600e-003	0.1569	0.0775	8.3000e-004	0.0191	1.3400e-003	0.0205	5.9600e-003	1.2800e-003	7.2400e-003		87.5627	87.5627	4.0000e-004	0.0122	91.1922
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	0.0108	1.1000e-004	0.0109	3.0300e-003	1.0000e-004	3.1200e-003		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0206**	**0.1643**	**0.1539**	**9.8000e-004**	**0.0299**	**1.4500e-003**	**0.0314**	**8.9900e-003**	**1.3800e-003**	**0.0104**		**103.4228**	**103.4228**	**1.3500e-003**	**0.0129**	**107.2854**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Facility Installation - 2023

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	0.9337	7.7663	8.0496	0.0189		0.3264	0.3264		0.3155	0.3155		1,769.7868	1,769.7868	0.3549		1,778.6604
Total	**0.9337**	**7.7663**	**8.0496**	**0.0189**		**0.3264**	**0.3264**		**0.3155**	**0.3155**		**1,769.7868**	**1,769.7868**	**0.3549**		**1,778.6604**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	18.4068	1.1000e-004	18.4069	1.8387	1.0000e-004	1.8388		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**18.4068**	**1.1000e-004**	**18.4069**	**1.8387**	**1.0000e-004**	**1.8388**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.5 Facility Installation - 2023

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	0.9337	7.7663	8.0496	0.0189		0.3264	0.3264		0.3155	0.3155	0.0000	1,769.7868	1,769.7868	0.3549		1,778.6604
Total	**0.9337**	**7.7663**	**8.0496**	**0.0189**		**0.3264**	**0.3264**		**0.3155**	**0.3155**	**0.0000**	**1,769.7868**	**1,769.7868**	**0.3549**		**1,778.6604**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	0.0108	1.1000e-004	0.0109	3.0300e-003	1.0000e-004	3.1200e-003		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**0.0108**	**1.1000e-004**	**0.0109**	**3.0300e-003**	**1.0000e-004**	**3.1200e-003**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Piping and Septage System Installation - 2023

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	0.3563	3.5798	2.7575	9.7200e-003		0.1359	0.1359		0.1250	0.1250		940.6276	940.6276	0.3042		948.2331
Total	**0.3563**	**3.5798**	**2.7575**	**9.7200e-003**		**0.1359**	**0.1359**		**0.1250**	**0.1250**		**940.6276**	**940.6276**	**0.3042**		**948.2331**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	18.4068	1.1000e-004	18.4069	1.8387	1.0000e-004	1.8388		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**18.4068**	**1.1000e-004**	**18.4069**	**1.8387**	**1.0000e-004**	**1.8388**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Piping and Septage System Installation - 2023

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	0.3563	3.5798	2.7575	9.7200e-003		0.1359	0.1359		0.1250	0.1250	0.0000	940.6276	940.6276	0.3042		948.2331
Total	**0.3563**	**3.5798**	**2.7575**	**9.7200e-003**		**0.1359**	**0.1359**		**0.1250**	**0.1250**	**0.0000**	**940.6276**	**940.6276**	**0.3042**		**948.2331**

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	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
Worker	0.0129	7.3500e-003	0.0764	1.5000e-004	0.0108	1.1000e-004	0.0109	3.0300e-003	1.0000e-004	3.1200e-003		15.8600	15.8600	9.5000e-004	7.0000e-004	16.0932
Total	**0.0129**	**7.3500e-003**	**0.0764**	**1.5000e-004**	**0.0108**	**1.1000e-004**	**0.0109**	**3.0300e-003**	**1.0000e-004**	**3.1200e-003**		**15.8600**	**15.8600**	**9.5000e-004**	**7.0000e-004**	**16.0932**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Paving and Grading - 2023

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	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	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**

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	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
Worker	0.0103	5.8800e-003	0.0611	1.2000e-004	14.7254	9.0000e-005	14.7255	1.4710	8.0000e-005	1.4711		12.6880	12.6880	7.6000e-004	5.6000e-004	12.8745
Total	**0.0103**	**5.8800e-003**	**0.0611**	**1.2000e-004**	**14.7254**	**9.0000e-005**	**14.7255**	**1.4710**	**8.0000e-005**	**1.4711**		**12.6880**	**12.6880**	**7.6000e-004**	**5.6000e-004**	**12.8745**

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.7 Paving and Grading - 2023

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	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
Paving	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**

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	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
Worker	0.0103	5.8800e-003	0.0611	1.2000e-004	8.6200e-003	9.0000e-005	8.7100e-003	2.4200e-003	8.0000e-005	2.5000e-003		12.6880	12.6880	7.6000e-004	5.6000e-004	12.8745
Total	**0.0103**	**5.8800e-003**	**0.0611**	**1.2000e-004**	**8.6200e-003**	**9.0000e-005**	**8.7100e-003**	**2.4200e-003**	**8.0000e-005**	**2.5000e-003**		**12.6880**	**12.6880**	**7.6000e-004**	**5.6000e-004**	**12.8745**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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	0.3420	0.2370	1.5248	1.0400e-003	36.7139	1.3500e-003	36.7152	3.6638	1.2500e-003	3.6651		107.7556	107.7556	0.0310	0.0171	113.6339
Unmitigated	0.3420	0.2370	1.5248	1.0400e-003	36.7139	1.3500e-003	36.7152	3.6638	1.2500e-003	3.6651		107.7556	107.7556	0.0310	0.0171	113.6339

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	210.00	42.00	42.00	27,671	27,671
Total	210.00	42.00	42.00	27,671	27,671

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
General Light Industry	0.50	0.50	0.50	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.526464	0.059349	0.179786	0.147621	0.026929	0.006851	0.008316	0.016412	0.000925	0.000120	0.022958	0.000766	0.003504

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	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672
NaturalGas Unmitigated	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672

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					
General Light Industry	3720.16	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672
Total		**0.0401**	**0.3647**	**0.3064**	**2.1900e-003**		**0.0277**	**0.0277**		**0.0277**	**0.0277**		**437.6664**	**437.6664**	**8.3900e-003**	**8.0200e-003**	**440.2672**

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					
General Light Industry	3.72016	0.0401	0.3647	0.3064	2.1900e-003		0.0277	0.0277		0.0277	0.0277		437.6664	437.6664	8.3900e-003	8.0200e-003	440.2672
Total		**0.0401**	**0.3647**	**0.3064**	**2.1900e-003**		**0.0277**	**0.0277**		**0.0277**	**0.0277**		**437.6664**	**437.6664**	**8.3900e-003**	**8.0200e-003**	**440.2672**

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	1.0592	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003
Unmitigated	1.0592	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003

Seeley County Water District Wastewater Treatment Improvements Project - Imperial County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

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	0.1600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8988					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-004	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003
Total	**1.0592**	**4.0000e-005**	**4.2800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**9.1900e-003**	**9.1900e-003**	**2.0000e-005**		**9.7900e-003**

6.2 Area by SubCategory

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	0.1600					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8988					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	4.0000e-004	4.0000e-005	4.2800e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005		9.1900e-003	9.1900e-003	2.0000e-005		9.7900e-003
Total	**1.0592**	**4.0000e-005**	**4.2800e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**		**9.1900e-003**	**9.1900e-003**	**2.0000e-005**		**9.7900e-003**

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
Off-Highway Trucks	2	6.00	12	350	0.38	Diesel

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

UnMitigated/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
Equipment Type	lb/day										lb/day					
Off-Highway Trucks	0.6523	4.3678	4.2659	0.0174		0.1573	0.1573		0.1447	0.1447	0.0000	1,680.4599	1,680.4599	0.5435		1,694.0473
Total	**0.6523**	**4.3678**	**4.2659**	**0.0174**		**0.1573**	**0.1573**		**0.1447**	**0.1447**	**0.0000**	**1,680.4599**	**1,680.4599**	**0.5435**		**1,694.0473**

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

INITIAL STUDY/ NEGATIVE DECLARATION
Seeley County Water District Wastewater Treatment Plant Improvements

Appendix B: Geotechnical Investigation Report (2021 and 2026)

Geotechnical Report

Seeley Wastewater Treatment Plant Improvements
NWC West Main Street and New River Boulevard
Seeley, California

Prepared for:

Hazen and Sawyer
11260 El Camino Real, Suite 102
San Diego, CA 92130



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February 2021

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February 26, 2021

Mr. Kevin Alexander
Hazen and Sawyer
11260 El Camino Real, Suite 102
San Diego, CA 92130

Geotechnical Report
SCWD WWTP Improvements
NWC West Main Street and New River Blvd.
Seeley, California
LCI Report No. LE21017

Dear Mr. Alexander:

This geotechnical report is provided for design and construction of the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California. Our geotechnical exploration was conducted in response to your request for our services. The enclosed report describes our soil engineering site evaluation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

Based on the geotechnical conditions encountered at the points of exploration, the project site appears suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 370-3000.

Respectfully Submitted,
Landmark Consultants, Inc.

Julian R. Avalos, GE
Senior Geotechnical Engineer

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EXECUTIVE SUMMARY

This executive summary presents ***selected*** elements of our findings and professional opinions. This summary ***may not*** present all details needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are ***best related through reading the full report***, and are best evaluated with the active participation of the engineer of record who developed them. The findings of this study are summarized below:

Aerated

- Subsurface soils consist of about 4 feet of stiff silty clay/clayey silt (CL-ML) soils of low to moderate swell potential (Expansion Index, EI = 21 to 90). Medium dense silty sand/sandy silt (SM-ML) layer was encountered to a depth of 4 feet to 13 feet below ground surface. Medium stiff to stiff clay soils (CL-CH) were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration.

- The new office building foundation designs should mitigate expansive soil conditions by either the removal and replacement of the upper 2.5 feet of clay/silt soils with non-expansive soil. Alternatively, foundations may be designed to resist expansive forces, such as flat plate structural mats, or grade-beam stiffened floor slabs. A combination of the methods described above may also be used.

- The risk of liquefaction induced settlement is low. Liquefaction can occur within a 9-foot-thick sandy silt/silty sand layer encountered at a depth of 4 feet below ground surface. Potential liquefaction induced settlements of less than 1 inch have been estimated for the project site. There is a very low risk of ground rupture and/or sand boil formation should liquefaction occur.

- Low to moderate sulfate and severe chloride levels were encountered in the soil samples tested for this study. However, in consideration of general corrosive environment in the vicinity, it is recommended that concrete mixes for concrete placed in contact with native soils shall have a maximum water cement ratio of 0.45 and a minimum compressive strength of 4,500 psi (minimum of 6 sacks Type V cement per cubic yard). All concrete should be thoroughly vibrated to remove rock pockets and minimize air voids.

- All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934). Hold-down straps at the foundation perimeter and pressurized water lines below or within the foundations are not allowed.

Section 1
INTRODUCTION

1.1 Project Description

This report presents the findings of our geotechnical exploration and soil testing for the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California (See Vicinity Map, Plate A-1).

The proposed improvements will consist of a septage receiving station, MBR Package, sludge drying beds, office building and several small structures to support equipment such pumps, control panels and/or electrical gear. A site plan for the proposed development was provided by the client at the time that this report was prepared. Site development will include; subgrade preparation for structures, basin excavations, underground utility installation including trench backfill and concrete foundation construction.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the subsurface soil at selected locations within the site for evaluation of physical/engineering properties and liquefaction potential during seismic events. Professional opinions were developed from field and laboratory test data and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction. The scope of our services consisted of the following:

- Field exploration and in-situ testing of the site soils at selected locations and depths.
- Laboratory testing for physical and/or chemical properties of selected samples.
- Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- Engineering analysis and evaluation of the data collected.
- Preparation of this report presenting our findings and professional opinions regarding the geotechnical aspects of project design and construction.

This report addresses the following geotechnical parameters:

- Subsurface soil and groundwater conditions
- Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- Liquefaction potential and its mitigation
- Expansive soil and methods of mitigation
- Aggressive soil conditions to metals and concrete

Professional opinions with regard to the above parameters are provided for the following:

- Site grading and earthwork
- Building pad and foundation subgrade preparation
- Allowable soil bearing pressures and estimated settlements
- Concrete slabs-on-grade
- Lateral earth pressures
- Excavation conditions and buried utility installations
- Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- Seismic design parameters

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions, storm water infiltration, groundwater mounding, or landscape suitability of the soil.

1.3 Authorization

Hazen and Sawyer provided authorization by Subcontract Agreement for Professional Services for our work on January 18, 2021. We conducted our work according to our written proposal dated November 17, 2020.

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

Subsurface exploration was performed on February 16, 2021 using 2R Drilling of Chino, California to advance two (2) borings to depths of 51.5 feet below existing ground surface. The borings were advanced with a truck-mounted, CME 75 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers. The approximate boring locations were established in the field and plotted on the site map by sighting to discernible site features. The boring locations are shown on the Site and Exploration Plan (Plate A-2).

A professional engineer observed the drilling operations and maintained logs of the soil encountered with sampling depths. Soils were classified during drilling according to the Unified Soil Classification System using the visual-manual procedure in accordance with ASTM D2488. Relatively undisturbed and bulk samples of the subsurface materials were obtained at selected intervals. The relatively undisturbed soil samples were retrieved using a 2-inch outside diameter (OD) split-spoon sampler or a 3-inch OD Modified California Split-Barrel (ring) sampler lined with 6-inch stainless-steel sleeves. In addition, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586 and ASTM D6066. The samples were obtained by driving the samplers ahead of the auger tip at selected depths using a 140-pound CME automatic hammer with a 30-inch drop. The number of blows required to drive the samplers the last 12 inches of an 18-inch drive depth into the soil is recorded on the boring logs as “blows per foot”. Blow counts (N values) reported on the boring logs represent the field blow counts. No corrections have been applied to the blow counts shown on the boring logs for effects of overburden pressure, automatic hammer drive energy, drill rod lengths, liners, and sampler diameter. Pocket penetrometer readings were also obtained to evaluate the stiffness of cohesive soils retrieved from sampler barrels.

After logging and sampling the soil, the exploratory borings were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

The subsurface logs are presented on Plates B-1 and B-2 in Appendix B. A key to the log symbols is presented on Plate B-3. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Laboratory Testing

Laboratory tests were conducted on selected bulk (auger cuttings) and relatively undisturbed soil samples obtained from the soil borings to aid in classification and evaluation of selected engineering properties of the site soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- Plasticity Index (ASTM D4318)
- Particle Size Analyses (ASTM D422)
- Unit Dry Densities (ASTM D2937)
- Moisture Contents (ASTM D2216)
- Direct Shear (ASTM D3080)
- Unconfined Compression (ASTM D2166)
- Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods)

The laboratory test results are presented on the subsurface logs (Appendix B) and on Plates C-1 through C-4 in Appendix C.

Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were obtained from the field and laboratory testing program.

Section 3
DISCUSSION

3.1 Site Conditions

The existing Seeley Wastewater Treatment Plant (WWTP) is located at the northwest corner of West Main Road and New River Boulevard in western Seeley, California. The proposed improvements are located within an area that once consisted of three wastewater treatment ponds that are approximately 2 to 3 feet lower than the north side of the WWTP site. It is our understanding that these ponds were used for about 1 year, and then were abandoned roughly 30 years ago after a landslide and piping failure occurred on the New River bluffs along the western edge of the WWTP property. Water infiltration from the ponds accessed sand soil strata and emerged at the incised New River channel bluff.

The western edge portion of the WWTP were backfilled with undocumented fill to the existing WWTP ground level. The new improvements will be located at the west side of the existing Biolac and Aeration ponds. The new office building is planned to be located on the plant parking lot at the south side of the existing office building.

The Seeley WWTP is entirely surrounded by a chain-link fence with two access gates from the parking lot. Office and operation buildings, parking area and primary treatment ponds are located to the north side of the proposed improvements area. The western edge of the Seeley WWTP property is bordered by steep bluffs which descend to the bottom of an incised flood channel and the banks of the New River. The western bluff descending to the New River consists of two (2) benches, one of approximately 15 to 20 feet (upper bench) and one of 50 to 60 feet (lower bench) west of the Seeley WWTP site. Properties to the east of the Seeley WWTP consist of single-family residential homes. Vacant land abuts the south side of the WWTP property. Active irrigated agricultural land lies to the north side of the WWTP property.

The adjacent New River flood channel is incised into lake bed sediments, about 700 to 800 feet wide from bank to bank, and about 50 to 60 feet deep. The channel was created by floodwaters from the accidental diversion of the Colorado River between 1905 and 1907. The Boulder Canyon project constructed on the Colorado River in the 1930's has regulated flood waters on the river so that flooding does not occur. The incised New River Channel extends from Calexico to the Salton Sea.

The project site lies at an elevation of approximately 45 feet below mean sea level (MSL) (El. 955 local datum) in the Imperial Valley region of the California low desert. The surrounding properties lie on terrain which is flat (planar), part of a large agricultural valley, which was previously an ancient lake bed covered with fresh water to an elevation of 43± feet above MSL. Annual rainfall in this arid region is less than 3 inches per year with four months of average summertime temperatures above 100 °F. Winter temperatures are mild, seldom reaching freezing.

3.2 Geologic Setting

The project site is located in the Salton Trough region of the Colorado Desert physiographic province of southeastern California. The Salton Trough is a topographic and geologic structural depression resulting extending from the San Gorgonio Pass to the Gulf of California (Norris & Webb, 1990). The Salton Trough is bounded on the northeast by the San Andreas fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments deposited since the Miocene Epoch (Morton, 1977). Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene (present) lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a fresh water lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet.

3.3 Subsurface Soil

The UC Davis California Soil Resource Lab "SoilWeb Earth" computer application (UC Davis, 2021) for Google Earth indicates that surficial deposits at the project site consist predominantly of silty clay loams overlying fine sands of the Imperial, Indio and Holtville soil groups (see Plate A-3). These loams are formed in sediment and alluvium of mixed origin (Colorado River overflows and fresh-water lake-bed sediments).

The subsurface soils encountered during the field exploration conducted on February 16, 2021 consist of about 4 feet of stiff silty clay/clayey silt (CL-ML) soils. A medium dense silty sand/sandy silt (SM-ML) layer was encountered to a depth of 4 feet to 13 feet below ground surface. Medium stiff to stiff clay soils (CL-CH) were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration. The subsurface logs (Plates B-1 and B-2) depict the stratigraphic relationships of the various soil types.

The native surface silty clays/clayey silts likely exhibit low to moderate swell potential (Expansion Index, EI = 21 to 90) when correlated to Plasticity Index tests (ASTM D4318) performed on the native clays/silts. Sandy silty/silty sand soil layers exhibit very low to low swell potential (Expansion Index, EI = 10 to 30).

3.4 Groundwater

Groundwater was encountered in the borings at about 40 to 42 feet at the time of exploration, but may rise with time to approximately 10 to 12 feet below ground surface at this site. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. Groundwater levels may fluctuate with water levels in the existing ponds, irrigation of adjacent properties, precipitation, drainage, and site grading. The referenced groundwater level should not be interpreted to represent an accurate or permanent condition. Our work scope did not include a groundwater surface mounding study resulting from applied landscape water.

3.5 Faulting

The project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (USGS, 1990). We have performed a computer-aided search of known faults or seismic zones that lie within a 62 mile radius of the project site (Table 1).

A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults. The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults (CGS, 2019b). Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the Alquist-Priolo Act (AP).

Review of the current Earthquake Fault Zone maps (CGS, 2019a) indicates that the nearest zoned fault is the Superstition Hills fault located approximately 5.4 miles north of the project site.

3.6 General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. **This project site has been classified as Site Class D and has a S_1 value of 0.6, which would require a site-specific ground motion hazard analysis**. However, ASCE 7-16 Section 11.4.8 provides three exceptions which permit the use of conservative values of design parameters for certain conditions for Site Class D and E sites in lieu of a site specific hazard analysis. The exceptions are:

- Exception 1: Structures on Site Class E sites with S_s greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.
- Exception 2: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Equations 12.8-2 for values of $T \leq 1.5T_S$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $T_L \geq T > 1.5T_S$ or Equation 12.8-4 for $T > T_L$.
- Exception 3: Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_S and the equivalent static force procedure is used for design.

The project structural engineer should confirm that an exception applies to the project. If none of the exceptions apply, our office should be consulted to perform a site-specific ground motion hazard analysis.

The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2021) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions. The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGA_M) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803.5.12 ($PGA_M = F_{PGA}*PGA$) is estimated at 0.65g for the project site. **Design earthquake ground motion parameters are provided in Table 2.**

3.7 Seismic and Other Hazards

- **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the Imperial, Laguna Salada, and Superstition Hills faults.
- **Surface Rupture.** The California Geological Survey (2019b) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consists of boundary zones surrounding well defined, active faults or fault segments. The project site does not lie within an A-P Earthquake Fault Zone; therefore, surface fault rupture is considered to be low at the project site.
- **Liquefaction and lateral spreading.** Liquefaction is a potential design consideration because of underlying saturated sandy substrata. Although the Imperial Valley has not yet been evaluated for seismic hazards by the California Geological Survey seismic hazards zonation program, liquefaction is well documented in the Imperial Valley after strong seismic events (McCrink, et al, 2011 and Rymer et al, 2011). The potential for liquefaction at the site is discussed in more detail in Section 3.8.

Other Potential Geologic Hazards.

- **Landsliding.** The project site is located within the incised New River channel. Even though the western portion of the WWTP property has been re-graded, there are indications of a landslide on the New River bluff along the western edge of the site. An alignment of tension cracks and piping (surface water ducts through embankment) were observed parallel to the New River bluff south of the Seeley WWTP. The geotechnical report prepared by Landmark Consultants in 2012 (Seeley WWTP Slope Stability Study – New River Bluff) indicated tension cracks associated with the landslide extending back into the area of the previously abandoned unlined wastewater ponds. Evidence of piping in the southwest corner of the site which has been covered by recent placement of undocumented fill on the western side of the project site was also mentioned in the 2012 Report.
- **Volcanic hazards.** The site is not located proximal to any known volcanically active area and the risk of volcanic hazards is considered low. Obsidian Butte and Red Hill, located at the south end of the Salton Sea approximately 25 miles north of the project site, are small remnants of volcanic domes. The domes erupted about 1,800 to 2,500 years ago (Wright et al, 2015). The subsurface brine fluids around the domes have a high heat flow and are currently being utilized to produce geothermal energy.

- **Tsunamis and seiches.** Tsunamis are giant ocean waves created by strong underwater seismic events, asteroid impact, or large landslides. Seiches are large waves generated in enclosed bodies of water in response to strong ground shaking. The site is not located near any large bodies of water, so the threat of tsunami, seiches, or other seismically-induced flooding is considered unlikely.
- **Flooding.** Based on our review of FEMA (2008) FIRM Panel 06025C1700C which encompasses the project site, the project site is located in Flood Zone X, an area determined to be outside the 0.2% annual chance (500-year) floodplain.
- **Collapsible soils.** Collapsible soil generally consists of dry, loose, low-density material that have the potential collapse and compact (decrease in volume) when subjected to the addition of water or excessive loading. Soils found to be most susceptible to collapse include loess (fine grained wind-blown soils), young alluvium fan deposits in semi-arid to arid climates, debris flow deposits and residual soil deposits. Due to the cohesive nature of the subsurface soils and shallow groundwater, the potential for hydro-collapse of the subsurface soils at this project site is considered very low.
- **Expansive soils.** In general, much of the near surface soils in the Imperial Valley consist of silty clays and clays which are moderate to highly expansive. The expansive soil conditions are discussed in more detail in Section 3.3.

3.8 Liquefaction

Liquefaction occurs when granular soils below the water table are subjected to vibratory motions, such as those produced by earthquakes. With strong ground shaking, the pore water pressure increases as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2008) methods. The 1997 NCEER methods utilize direct SPT blow counts from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected blow count $N_{1(60)}$. The analysis was performed using a PGA_M value of 0.65g was used in the analysis with a 10-foot groundwater depth and a threshold factor of safety (FS) of 1.3.

The fines content of the liquefiable sands and silts increases their liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures. Prior to calculating the settlements, the field SPT blow counts were corrected to account for the type of hammer, borehole diameter, overburden pressure and rod length $N_{1(60)}$ in accordance with Idriss and Boulanger (2008). The corrected blow counts were then converted to equivalent clean sand blow counts ($N_{1(60)cs}$).

The soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within a 9-foot-thick sandy silt/silty sand layer encountered at a depth of 4 feet below ground surface. The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the Imperial, Laguna Salada, and Superstition Hills fault. The analysis is summarized in the table below.

Summary of Liquefaction Analysis

Boring Location	Depth To First Liquefiable Zone (ft)	Potential Induced Settlement (in)
B-1	10	---
B-2	10	1.0

Liquefaction Induced Settlements: ***Based on empirical relationships, total induced settlements are estimated to be about 1 inches should liquefaction occur.*** Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with California Special Publication 117. Accordingly, there is a potential for ⅔ inches of liquefaction induced differential settlement at the project site.

Because of the depth of the liquefiable layer, the 10-foot thick non-liquefiable clay layer will likely act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures.

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003).

Liquefaction induced lateral spreading is not expected to occur at the proposed improvements area due to the semi-planar topography. The only areas with lateral spreading potential are situated at the New River channel slopes, located approximately 175 to 200 feet west from the most western proposed structure (MBR Package). According to Youd (2005), if the liquefiable layer lies at a depth greater that about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site except for the shallow sludge drying bed, which depths are substantially above the first liquefiable layer.

Mitigation: Based on an estimate of less than 1 inch of liquefaction induced settlements, no ground improvement or deep foundation mitigation is required at this project site.

Section 4
DESIGN CRITERIA

4.1 Site Preparation

Preconstruction Meeting: A preconstruction conference should be held at the site prior to the beginning of grading operations with, as a minimum, the owner's representative, grading contractor and geotechnical engineer in attendance.

Clearing and Grubbing: All surface improvements, debris or vegetation including grass, trees, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic strippings should be stockpiled and not used as engineered fill. All trash, construction debris, concrete slabs, old pavement, landfill, contaminated soil, and buried obstructions such as old foundations and utility lines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision. Any excavations resulting from site clearing should be sloped to a bowl shape to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

Subgrade Preparation for Buildings (Shallow Foundations): The existing surface soil within building pad/foundation areas should be removed to 30 inches below the building pad elevation or existing natural surface grade (whichever is lower) extending five feet beyond all exterior wall/column lines (including concreted areas adjacent to the building). Exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to 5 to 10% above optimum moisture content (clays) or 2 to 6% above optimum (silts), and recompacted to 85 to 90% (clays) or 87 to 92% (silts) of the maximum density determined in accordance with ASTM D1557 methods. Alternately, to avoid special foundation designs for expansive soil, the surface 30 inches of native clays may be removed and replaced with granular fill, placed and compacted to at least 90% of ASTM D1557 maximum density.

The native soil is suitable for use as engineered fill provided it is free from concentrations of organic matter or other deleterious material. The fill soil should be uniformly moisture conditioned by discing and watering to the limits specified above, placed in maximum 8-inch lifts (loose), and compacted to the limits specified above. Clay soil should not be overcompacted because highly compacted soil will result in increased swelling.

Imported fill soil (for foundations designed for expansive soil conditions) should have a Plasticity Index less than 15 and sulfates (SO_4) less than 1,500 ppm.

If foundation designs are to be utilized which do not include provisions for expansive soil, an engineered building support pad consisting of 2.5 feet of granular soil, placed in maximum 8-inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture, should be placed below the bottom of the slab.

The imported soils should meet the USCS classifications of ML (non-plastic), SM, SP-SM, or SW-SM with a maximum rock size of 3 inches and no less than 5% passing the No. 200 sieve. The geotechnical engineer should approve imported fill soil sources before hauling material to the site. Imported fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture ±2%.

Sidewalk and Concrete Hardscape Areas: In areas other than the building pad which are to receive sidewalks or area concrete slabs, the ground surface should be presaturated to a minimum depth of 24 inches and then scarified to 8 inches, moisture conditioned to a minimum of 5% over optimum, and recompacted to 85-90% of ASTM D1557 maximum density just prior to concrete placement.

Site Preparation for Mat Foundations and/or Concrete Foundation Slabs: For equipment supported on shallow foundations, the existing soil within the foundation areas should be removed to 12 inches below the bottom of the proposed foundation elevation extending five feet beyond the perimeter walls. Exposed subgrade should be scarified to a depth of 12 inches, uniformly moisture conditioned to a minimum of 2 to 6% above optimum moisture content, and recompacted to a minimum of 90% of the maximum density determined in accordance with ASTM D1557 methods.

The area should then be brought to bottom of structure grade with 12 inches of Class 2 aggregate base, compacted to at least of 95% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture. Alternately, a geotextile filter fabric (Mirafi 180, equivalent or better) and 12 inches of 1” x No. 4 (Size 57) crushed rock may be used below the structures.

If foundation structures are anticipated to be founded 10 feet below existing subgrade, the subsurface silts/sands are anticipated to be wet or saturated, consequently, the subgrade has a high potential for pumping under equipment loads. Therefore, the subgrade for the new structure, should be overexcavated 24 inches below the bottom of the structure and replaced with drainage rock (ASTM C33, Size 57 or 467). The bottom of the excavation should be covered with a geotextile filter fabric (Mirafi 180, equivalent or better) lapped at sides and ends in accordance with manufacture's installations guidelines.

The 2.0 ft thick layer of drainage rock should be end dumped onto the filter fabric and spread evenly by excavators or dozers. Upon completing placement of the drainage rock a small vibratory compactor (walk-behind or equivalent) should be used to densify the crushed rock layer. Following densification of the drainage rock, a second layer of filter fabric should be placed over the drainage rock.

Sludge Drying Beds: The new sludge drying beds is planned to be constructed at the west side of the existing Biolac and Aeration ponds. Since groundwater is expected to be about 10 feet below ground surface, the bottom of the excavations should have a minimum distance of 2 feet above groundwater. Fine grading at the bottom of the basin may be difficult since clayey silt or sandy silts/silty sands are expected to be encountered at the bottom of the excavations.

All areas to receive new fill for the embankments should be stripped of all vegetation, scarified and recompacted for a minimum depth of 12 inches below the designed bottom basin elevation to 90% (minimum) of the maximum density at optimum moisture 2 to 6% in accordance with ASTM D1557 methods.

On-site materials from the excavation are anticipated to be used as embankment fill. The fill soils should consist of silty clay/clayey silt (CL-ML) and sandy silt/silty sands (ML-SM). The embankment fill should be uniformly moisture conditioned to 2-6 percent over optimum moisture and placed in 6 inch maximum lifts at 90% of ASTM D1557 maximum density.

If imported clay soils (CL-CH) from potential borrow sites are considered adequate for engineered embankment fill, they should be pulverized/disced to less than ¾ inch maximum clod size, uniformly moisture conditioned to 5-10 percent over optimum, and placed in 6 inch maximum lifts at a minimum of 90% of ASTM D1557 maximum density.

Taking into consideration that the slopes will be protected with a synthetic liner, the embankment slopes should be no steeper than 2:1. However, flatter slopes may be considered to permit maintenance. Embankments should be overbuilt by 6 inches and subsequently cut to the plan line and grade to remove loose material along the slope faces.

Moisture Control and Drainage: If clay soils are used at building pads (without 2.5 feet of granular, non-plastic soil), the moisture condition of the building pad should be maintained during trenching and utility installation until concrete is placed or should be rewetted by use of multiple applications of water with sprinklers before initiating delayed construction. If soil drying is noted in footings, a 2 to 3 inch depth of water may be used in the bottom of footings to restore footing subgrade moisture and reduce potential edge lift.

Adequate site drainage is essential to future performance of the project. Infiltration of excess irrigation water and stormwaters can adversely affect the performance of the subsurface soil at the site. Positive drainage should be maintained away from all structures (5% for 10 feet minimum across unpaved areas) to prevent ponding and subsequent saturation of the native clay soil. Gutters and downspouts should be used as a means to convey water away from foundations.

Observation and Density Testing: All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area. The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*" and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the geotechnical parameters for site development.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have footings extended to a minimum of 30 inches below grade. The existing soil beneath the structure foundation prepared in the manner described for the building pad except the preparation needed only to extend 18 inches below and beyond the footing.

4.2 Foundations and Settlements

Shallow spread footings are suitable to support the light loaded buildings provided they are structurally tied with grade-beams to continuous perimeter wall footings to resist differential movement associated with potentially expansive soils. Structural concrete mat foundations are suitable to support the MBR Package or other heavy equipment structure. Footings shall be founded on a layer of properly prepared and compacted soil as described in Section 4.1. The foundations may be designed using an allowable soil bearing pressure of 1,500 psf for compacted native soils and 2,000 psf when foundations are supported on imported sands or aggregate base (extending a minimum of 1.0 feet below footings). The allowable soil pressure may be increased by 20% for each foot of embedment depth in excess of 18 inches and by one-third for short term loads induced by winds or seismic events. The maximum allowable soil pressure at increased embedment depths shall not exceed 3,000 psf.

As an alternative to shallow spread foundations, flat plate structural mats or grade-beam reinforced foundations may be used to mitigate expansive soil heave and/or liquefaction related movement.

Flat Plate Structural Mats: Flat plate structural mats may be used to mitigate expansive soils at the project site. Structural concrete mat foundations may be designed using an allowable soil bearing pressure of 2,000 psf when the foundation is supported on 12 inches of compacted Class 2 aggregate base. The allowable soil pressure may be increased by one-third for short term loads induced by winds or seismic events. Design criteria for mat foundations are provided below. The structural mat shall have a double mat of steel (minimum No. 4's @ 12 inches O.C. each way – top and bottom) and a minimum thickness of 10 inches.

Structural mats may be designed for a modulus of subgrade reaction (Ks) of 50 pci when placed on compacted native soil, 150 pci when placed on 12 inches of compacted Class 2 aggregate base, or a subgrade modulus of 250 pci when placed on 24 inches of crushed rock (below grade structures) and when placed on 2.5 feet of granular fill (buildings).

Grade-beam Reinforced Foundations: Structures with grade beam reinforced foundations placed on the native soils shall have a maximum grade-beam spacing of 25 feet on center.

All footings should be embedded a minimum of 18 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum width of 24 inches. Recommended concrete reinforcement and sizing for all footings should be provided by the structural engineer.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 250 pcf (300 pcf for imported sands or crushed rock) to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.25 (0.35 for imported sands, aggregate base or crushed rock) may also be used at the base of the footings to resist lateral loading.

Settlements: Small buildings and small equipment foundations movement under the estimated static (non-seismic) loadings and static site conditions are estimated to not exceed ¾ inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed. Seismically induced liquefaction settlement of the surrounding land mass and structure may be on the order of 1 inch (total) and ⅔ inches (differential).

4.3 Slabs-On-Grade

Structural Concrete: Structural concrete slabs are those slabs (foundations) that underlie structures or patio covers (shades). These slabs that are placed over native clay soil should be either a uniformly thick structural mats (10 inches or greater) or should be designed in accordance with Chapter 18 of the 2019 CBC and shall be a minimum of 5 inches thick due to expansive soil conditions. Concrete floor slabs shall be monolithically placed with the footings (no cold joints) unless placed on 2.5 feet of import granular fill soil.

American Concrete Institute (ACI) guidelines (ACI 302.1R-04 Chapter 3, Section 3.2.3) provide recommendations regarding the use of moisture barriers beneath concrete slabs. The concrete floor slabs should be underlain by a 10-mil polyethylene vapor retarder that works as a capillary break to reduce moisture migration into the slab section. All laps and seams should be overlapped 6-inches or as recommended by the manufacturer.

The vapor retarder should be protected from puncture. The joints and penetrations should be sealed with the manufacturer's recommended adhesive, pressure-sensitive tape, or both. The vapor retarder should extend a minimum of 12 inches into the footing excavations. The vapor retarder should be covered by 4 inches of clean sand (Sand Equivalent SE>30) unless placed on 2.5 feet of granular fill, in which case, the vapor retarder may lie directly on the granular fill with 2 inches of clean sand cover.

Placing sand over the vapor retarder may increase moisture transmission through the slab, because it provides a reservoir for bleed water from the concrete to collect. The sand placed over the vapor retarder may also move and mound prior to concrete placement, resulting in an irregular slab thickness. For areas with moisture sensitive flooring materials, ACI recommends that concrete slabs be placed without a sand cover directly over the vapor retarder, provided that the concrete mix uses a low-water cement ratio and concrete curing methods are employed to compensate for release of bleed water through the top of the slab. The vapor retarder should have a minimum thickness of 15-mil (Stego-Wrap or equivalent).

Structural concrete slab reinforcement should consist of chaired rebar slab reinforcement (minimum of No. 3 bars at 18-inch centers, both horizontal directions) placed at slab mid-height to resist potential swell forces and cracking. Slab thickness and steel reinforcement are minimums only and should be verified by the structural engineer/designer knowing the actual project loadings.

All steel components of the foundation system should be protected from corrosion by maintaining a 3-inch minimum concrete cover of densely consolidated concrete at footings (by use of a vibrator). The construction joint between the foundation and any mowstrips/sidewalks placed adjacent to foundations should be sealed with a polyurethane based non-hardening sealant to prevent moisture migration between the joint. Epoxy coated embedded steel components (ASTM D3963/A934) or permanent waterproofing membranes placed at the exterior footing sidewall may also be used to mitigate the corrosion potential of concrete placed in contact with native soil.

Control joints should be provided in all concrete slabs-on-grade at a maximum spacing (in feet) of 2 to 3 times the slab thickness (in inches) as recommended by American Concrete Institute (ACI) guidelines. All joints should form approximately square patterns to reduce randomly oriented contraction cracks.

Contraction joints in the slabs should be tooled at the time of the pour or sawcut (¼ of slab depth) within 6 to 8 hours of concrete placement. Construction (cold) joints in foundations and area flatwork should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All joints in flatwork should be sealed to prevent moisture, vermin, or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region (refer to ACI guidelines).

Non-structural Concrete: All non-structural independent flatwork (sidewalks and housekeeping slabs) shall be a minimum of 4 inches thick and should be placed on a minimum of 4 inches of compacted (90%) concrete sand or aggregate base, dowelled to the perimeter foundations where adjacent to the building to prevent separation and sloped 2% (sidewalks) or 1 to 2% (housekeeping slabs) away from the building. Patio slabs with shade structures shall have a perimeter footing (18-inch embedment depth) and shall have interior grade beams (12-inch minimum embedment depth) at 15 feet on center. Planters that trap water between sidewalks and foundations are not allowed.

A minimum of 24 inches of moisture conditioned (5% minimum above optimum) and 8 inches of compacted subgrade (85 to 90%) should underlie all independent flatwork. Flatwork which contains steel reinforcing (except wire mesh) should be underlain by a 10-mil (minimum) polyethylene separation sheet and at least a 2-inch sand cover. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 8 feet or the least width of the sidewalk.

4.4 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Plate C-4). The native soils were found to have S0 to S1 (low to moderate) levels of sulfate ion concentration (804 to 1,500ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling. The following table provides American Concrete Institute (ACI) recommended cement types, water-cement ratio and minimum compressive strengths for concrete in contact with soils:

Concrete Mix Design Criteria due to Soluble Sulfate Exposure

Sulfate Exposure Class	Water-soluble Sulfate (SO_4) in soil, ppm	Cement Type	Maximum Water-Cement Ratio by weight	Minimum Strength f'c (psi)
S0	0-1,000	–	–	–
S1	1,000-2,000	II	0.50	4,000
S2	2,000-20,000	V	0.45	4,500
S3	Over 20,000	V (plus Pozzolon)	0.45	4,500

Note: From ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

However, in consideration of general corrosive environment in the vicinity, it is recommended a minimum of 6.0 sacks per cubic yard of concrete (4,500 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.45 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including sidewalks, driveways, patios, and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete. Thorough concrete consolidation and hard trowel finishes should be used due to the aggressive soil exposure.

The native soil has severe levels of chloride ion concentration (1,180 to 1,240ppm). Chloride ions can cause corrosion of reinforcing steel, anchor bolts and other buried metallic conduits. Resistivity determinations on the soil indicate very severe potential for metal loss because of electrochemical corrosion processes. Mitigation of the corrosion of steel can be achieved by using steel pipes coated with epoxy corrosion inhibitors, asphaltic and epoxy coatings, cathodic protection or by encapsulating the portion of the pipe lying above groundwater with a minimum of 3 inches of densely consolidated concrete. ***No metallic water pipes or conduits should be placed below foundations.***

Foundation designs shall provide a minimum concrete cover of three (3) inches around steel reinforcing or embedded components (anchor bolts, etc.) exposed to native soil or landscape water (to 18 inches above grade). If the 3-inch concrete edge distance cannot be achieved, all embedded steel components (anchor bolts, etc.) shall be epoxy coated for corrosion protection (in accordance with ASTM D3963/A934) or a corrosion inhibitor and a permanent waterproofing membrane shall be placed along the exterior face of the exterior footings. ***Hold-down straps should not be used at foundation edges due to corrosion of metal at its protrusion from the slab edge.*** Additionally, the concrete should be thoroughly vibrated at footings during placement to decrease the permeability of the concrete. ***Copper water piping (except for trap primers) should not be placed under floor slabs.***

Landmark does not practice corrosion engineering. We recommend that a qualified corrosion engineer evaluate the corrosion potential on metal construction materials and concrete at the site to obtain final design recommendations.

4.5 Excavations

All site excavations should conform to CalOSHA requirements for Type B soil (if site is dewatered or Type C soils for non-dewatered excavations). The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be cut nearly vertical for short duration. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type B soil. These temporary deep excavations will require slope inclinations no steeper than 1½(H):1(V) unless trench shoring is used.

If excavations are planned below groundwater (10 feet below ground surface), all excavation slopes should be excavated according to OSHA Standards for Type C soils. Seepage and pumping subgrade conditions should be anticipated. An adequately designed dewatering system (well points) will be required to control groundwater seepage and prevent running ground conditions. Dewatering of the excavation site will be required prior to start of excavation (2 ft. below bottom of excavation).

All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

All discussions in this section regarding stable excavation slopes assumes minimal equipment vibration and adequate setback of excavated material and construction equipment from the top of the excavation. We recommended that the minimum setback distance be equal to the depth of excavation and at least 10 feet from the crown of the slope. If excavated materials are stockpiled adjacent to the excavation, the weight of the material should be considered as a surcharge load for slope stability.

The responsibility for dewatering and the selection and performance of an appropriate system is the contractor's responsibility. The contractor is cautioned to evaluate soil moisture and groundwater conditions at the time of bidding. This report should be made available to dewatering contractors for theirs initial assessment of the site conditions. However, it is the contractor's own risk to interpret the information contained in this report.

4.6 Utility Trench Backfill

Utility Trench Backfill: Prior to placement of utility bedding, the exposed subgrade at the bottom of trench excavations should be examined for soft, loose, or unstable soil. Loose materials at trench bottoms resulting from excavation disturbance should be removed to firm material. If extensive soft or unstable areas are encountered, these areas should be over-excavated to a depth of at least 2 feet or to a firm base and be replaced with additional bedding material.

Backfill Materials: Pipe zone backfill (i.e., material beneath and in the immediate vicinity of the pipe) should consist of a 4 to 8 inch bed of ⅜-inch crushed rock, sand/cement slurry (3 sack cement factor), and/or crusher fines (sand) extending to a minimum of 12 inches above the top of pipe. If crushed rock is used for pipe zone backfill for utilities, the crushed rock material should be completed surrounded by a non-woven filter fabric such as Mirafi 140N or equivalent. The filter fabric shall cover the trench bottom, sidewalls and over the top of the crushed rock. The filter fabric is recommended to inhibit the migration of fine material into void spaces in the crushed rock which may create the potential for sinkholes or depressions to develop at the ground surface.

Pipe bedding should be in accordance with pipe manufacturer's recommendations. Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipes. On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill above pipezone, but may be difficult to uniformly maintain at specified moistures and compact to the specified densities. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

Compaction Criteria: Mechanical compaction is recommended; ponding or jetting should not be allowed, especially in areas supporting structural loads or beneath concrete slabs supported-on-grade, pavements, or other improvements. All trench backfill should be placed and compacted in accordance with recommendations provided above for engineered fill.

The pipe zone material (crusher fines, sand) shall be compacted to a minimum of 95% of ASTM D1557 maximum density. Pipe deflection should be checked to not exceed 2% of pipe diameter. Native clay/silt soils may be used to backfill the remainder of the trench. Soils used for trench backfill shall be placed in maximum 6 inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at a minimum of 4% above optimum moisture.

Imported granular material is acceptable for backfill of utility trenches. Granular trench backfill used in building pad areas should be plugged with a solid (no clods or voids) 2-foot width of native clay soils at each end of the building foundation to prevent landscape water migration into the trench below the building.

Backfill soil of utility trenches within paved areas should be uniformly moisture conditioned to a minimum of 4% above optimum moisture, placed in layers not more than 6 inches in thickness and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density, except that the top 12 inches shall be compacted to 95% (if granular trench backfill).

4.7 Lateral Earth Pressures

Earth retaining structures, such as retaining walls, should be designed to resist the soil pressure imposed by the retained soil mass. Walls without granular drained backfill may be designed for an assumed static earth pressure equivalent to that exerted by a fluid weighing 60 (45 sand) pcf for unrestrained (active) conditions (able to rotate 0.1% of wall height), and 100 (60 sand) pcf for restrained (at-rest) conditions. These values should be verified at the actual wall locations during construction.

When applicable (Seismic Design Category D, E or F), retaining wall structures where the backfill is greater than 6 feet high shall be designed in addition to the static loading (active or at-rest condition) with an additional seismic lateral pressure increasing linearly with depth and the resultant acting as a point load at 0.4H above the base of the wall. The term H is the height of the backfill against a retaining wall in feet. The seismic load increment, shall be determined using the following equations for different wall type and backfill conditions:

Basement (restrained) walls with level backfill: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.68\ PGA_M/g)$

Cantilever (unrestrained) wall with level backfill: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.42\ PGA_M/g)$

Cantilever (unrestrained) wall with sloping backfill*: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.70\ PGA_M/g)$

*Applicable for sloping backfill that is no steeper than 2:1 (horizontal:vertical).

Where:
ΔK_{ae} = Seismic Lateral Force (plf) based on seismic pressure
γ = 125 pcf
A PGA_M value of 0.65g has been determined for the project site.
H = Height of retained soil (ft)

Surcharge loads should be considered if loads are applied within a zone between the face of the wall and a plane projected behind the wall 45 degrees upward from the base of the wall. The increase in lateral earth pressure acting uniformly against the back of the wall should be taken as 50% of the surcharge load within this zone. Areas of the retaining wall subjected to traffic loads should be designed for a uniform surcharge load equivalent to two feet of native soil.

Walls should be provided with backdrains to reduce the potential for the buildup of hydrostatic pressure. The drainage system should consist of a composite HDPE drainage panel or a 2-foot wide zone of free draining crushed rock placed adjacent to the wall and extending 2/3 the height of the wall. The gravel should be completely enclosed in an approved filter fabric to separate the gravel and backfill soil. A perforated pipe should be placed perforations down at the base of the permeable material at least six inches below finished floor elevations. The pipe should be sloped to drain to an appropriate outlet that is protected against erosion. Walls should be properly waterproofed. The project geotechnical engineer should approve any alternative drain system.

4.8 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the Imperial, Laguna Salada, and Superstition Hills faults. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Site Class D using the seismic coefficients given in Section 3.6 and Table 2 of this report.

Section 5
LIMITATIONS AND ADDITIONAL SERVICES

5.1 Limitations

The findings and professional opinions within this report are based on current information regarding the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California. The conclusions and professional opinions of this report are invalid if:

- Structural loads change from those stated or the structures are relocated.
- The Additional Services section of this report is not followed.
- This report is used for adjacent or other property.
- Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- Any other change that materially alters the project from that proposed at the time this report was prepared.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Imperial County at the time the report was prepared. No express or implied warranties are made in connection with our services.

Findings and professional opinions in this report are based on selected points of field exploration, geologic literature, limited laboratory testing, and our understanding of the proposed project. Our analysis of data and professional opinions presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. The nature and extend of such variations may not become evident until, during or after construction. If variations are detected, we should immediately be notified as these conditions may require additional studies, consultation, and possible design revisions.

Environmental or hazardous materials evaluations were not performed by Landmark for this project. Landmark will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

The client has responsibility to see that all parties to the project including designer, contractor, and subcontractor are made aware of this entire report within a reasonable time from its issuance. This report should be considered invalid for periods after two years from the date of report issuance without a review of the validity of the findings and professional opinions by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice. This report is based upon government regulations in effect at the time of preparation of this report. Future changes or modifications to these regulations may require modification of this report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify Landmark of such intended use. Based on the intended use of the report, Landmark may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Landmark from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Landmark harmless from any claim or liability associated with such unauthorized use or non-compliance.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded is such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 Plan Review

Landmark Consultants, Inc. should be retained during development of design and construction documents to check that the geotechnical professional opinions are appropriate for the proposed project and that the geotechnical professional opinions are properly interpreted and incorporated into the documents. Landmark should have the opportunity to review the final design plans and specifications for the project prior to the issuance of such for bidding.

Governmental agencies may require review of the plans by the geotechnical engineer of record for compliance to the geotechnical report.

5.3 Additional Services

We recommend that Landmark Consultant be retained to provide the tests and observations services during construction. *The geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

Landmark Consultants, Inc. professional opinions for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the findings and professional opinions in this report are made contingent upon the opportunity for Landmark Consultants to observe grading operations and foundation excavations for the proposed construction.

If parties other than Landmark Consultants, Inc. are engaged to provide observation and testing services during construction, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the professional opinions in this report and/or by providing alternative professional guidance.

Additional information concerning the scope and cost of these services can be obtained from our office.

Section 6
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TABLES

Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Unnamed 1*	4.9	7.9			
Superstition Hills	5.4	8.6	6.6	23 ± 2	4 ± 2
Superstition Mountain	6.4	10.2	6.6	24 ± 2	5 ± 3
Yuha*	6.9	11.1			
Unnamed 2*	7.8	12.5			
Shell Beds	8.1	13.0			
Yuha Well *	8.3	13.2			
Imperial	11.2	17.9	7	62 ± 6	20 ± 5
Laguna Salada	11.4	18.2	7	67 ± 7	3.5 ± 1.5
Vista de Anza*	11.6	18.5			
Painted Gorge Wash*	13.3	21.2			
Brawley *	13.4	21.4			
Ocotillo*	15.8	25.2			
Borrego (Mexico)*	16.6	26.5			
Rico *	17.4	27.8			
Elmore Ranch	18.5	29.6	6.6	29 ± 3	1 ± 0.5
Elsinore - Coyote Mountain	19.2	30.7	6.8	39 ± 4	4 ± 2
San Jacinto - Borrego	22.9	36.6	6.6	29 ± 3	4 ± 2
Pescadores (Mexico)*	24.0	38.4			
Cerro Prieto *	24.6	39.3			
Cucapah (Mexico)*	26.1	41.8			
San Andreas - Coachella	38.5	61.6	7.2	96 ± 10	25 ± 5

* Note: Faults not included in CGS database.

Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters

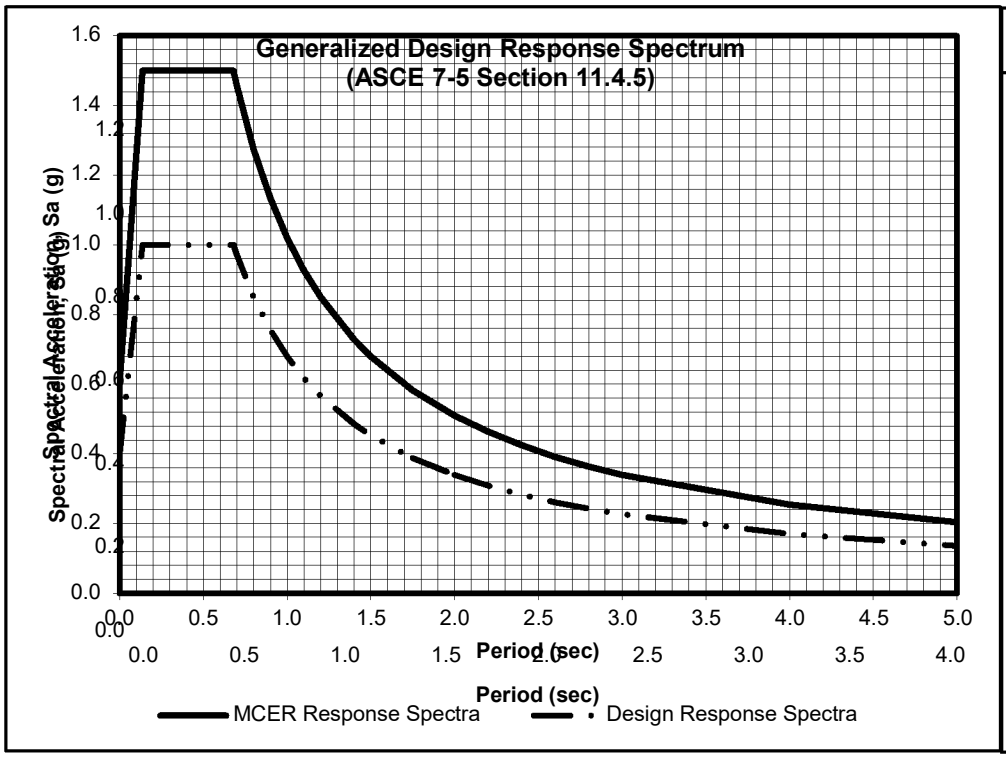
			ASCE 7-16 Reference
Soil Site Class:	**D**		Table 20.3-1
Latitude:	32.7934	N	
Longitude:	-115.7001	W	
Risk Category:	III		
Seismic Design Category:	D		

Maximum Considered Earthquake (MCE) Ground Motion

Mapped MCE_R Short Period Spectral Response	S_s	1.500 g	ASCE Figure 22-1	
Mapped MCE_R 1 second Spectral Response	S_1	0.600 g	ASCE Figure 22-2	
Short Period (0.2 s) Site Coefficient	F_a	1.00	ASCE Table 11.4-1	
Long Period (1.0 s) Site Coefficient	F_v	1.70	ASCE Table 11.4-2	
MCE_R Spectral Response Acceleration Parameter (0.2 s)	S_{MS}	1.500 g	= Fa * S_s	ASCE Equation 11.4-1
MCE_R Spectral Response Acceleration Parameter (1.0 s)	S_{M1}	1.020 g	= Fv * S_1	ASCE Equation 11.4-2

Design Earthquake Ground Motion

Design Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	1.000 g	= 2/3*S_{MS}	ASCE Equation 11.4-3
Design Spectral Response Acceleration Parameter (1.0 s)	S_{D1}	0.680 g	= 2/3*S_{M1}	ASCE Equation 11.4-4
Risk Coefficient at Short Periods (less than 0.2 s)	C_{RS}	0.968		ASCE Figure 22-17
Risk Coefficient at Long Periods (greater than 1.0 s)	C_{R1}	0.937		ASCE Figure 22-18
	T_L	8.00 sec		ASCE Figure 22-12
	T_O	0.14 sec	=0.2*S_{D1}/S_{DS}	
	T_S	0.68 sec	=S_{D1}/S_{DS}	
Peak Ground Acceleration	PGA_M	0.65 g		ASCE Equation 11.8-1



Period T (sec)	Sa (g)	MCE_R Sa (g)
0.00	0.40	0.60
0.14	1.00	1.50
0.68	1.00	1.50
0.70	0.97	1.46
0.80	0.85	1.28
0.90	0.76	1.13
1.00	0.68	1.02
1.10	0.62	0.93
1.20	0.57	0.85
1.20	0.57	0.85
1.40	0.49	0.73
1.50	0.45	0.68
1.75	0.39	0.58
2.00	0.34	0.51
2.20	0.31	0.46
2.40	0.28	0.43
2.60	0.26	0.39
2.80	0.24	0.36
3.00	0.23	0.34
4.00	0.17	0.26
5.00	0.14	0.20

FIGURES



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists **Project No.: LE21017**	**Regional Fault Map**	**Figure 1**



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists Project No.: LE21017	Map of Local Faults	Figure 2

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lekes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

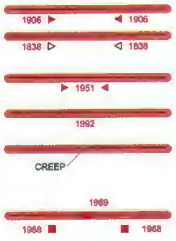
FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompenying earthquakes.

(c) displaced survey lines.



A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200		? ? ?	Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700		? ? ?	Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000		?	Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

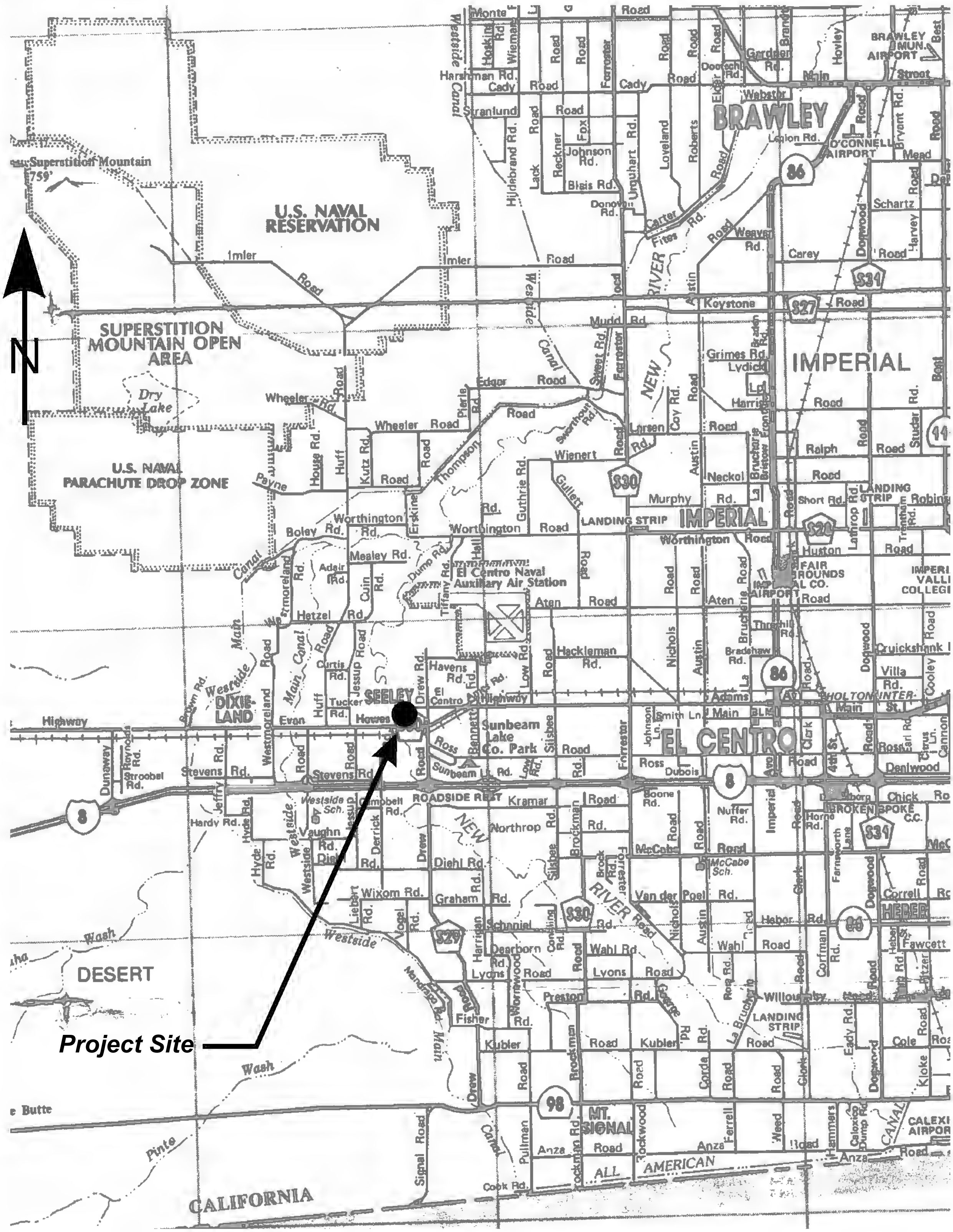
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Fault Map Legend

Figure 3

APPENDIX A



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Vicinity Map

Plate A-1

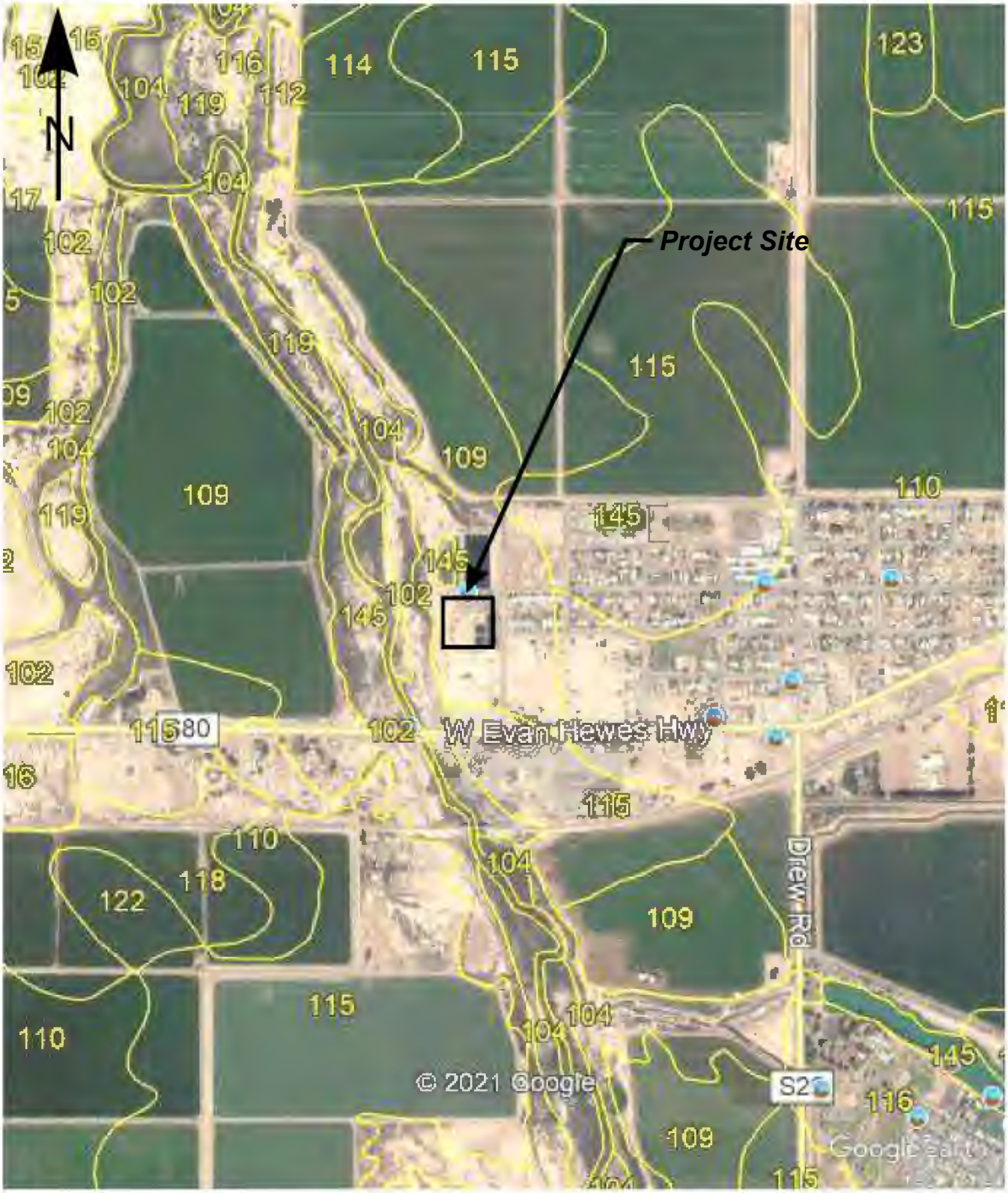


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Site and Exploration Map

Plate
A-2



LANDMARK
Geo-Engineers and Geologists

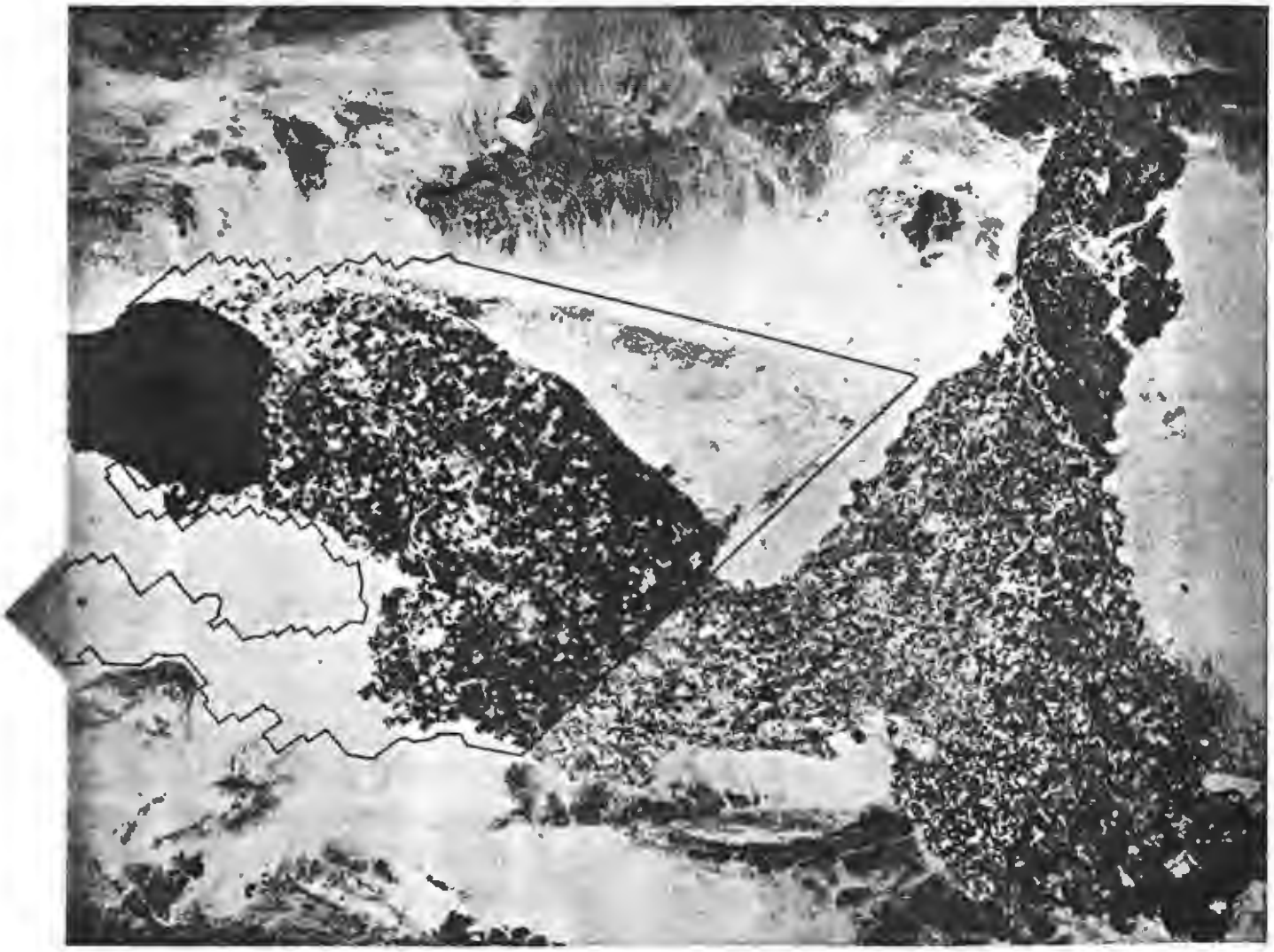
Project No.: LE21017

Soil Survey Map

Plate A-3

Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100---------- Antho	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho----------	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition------	0-6	Fine sand-------	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103---------- Carsitas	0-10	Gravelly sand---	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105---------- Glenbar	0-13	Clay loam-------	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106---------- Glenbar	0-13	Clay loam-------	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107*---------- Glenbar	0-13	Loam----------	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108---------- Holtville	0-14	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109---------- Holtville	0-17	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110---------- Holtville	0-17	Silty clay------	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*:											
Holtville	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Indio	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*	0-12	Loam	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
Laveen	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

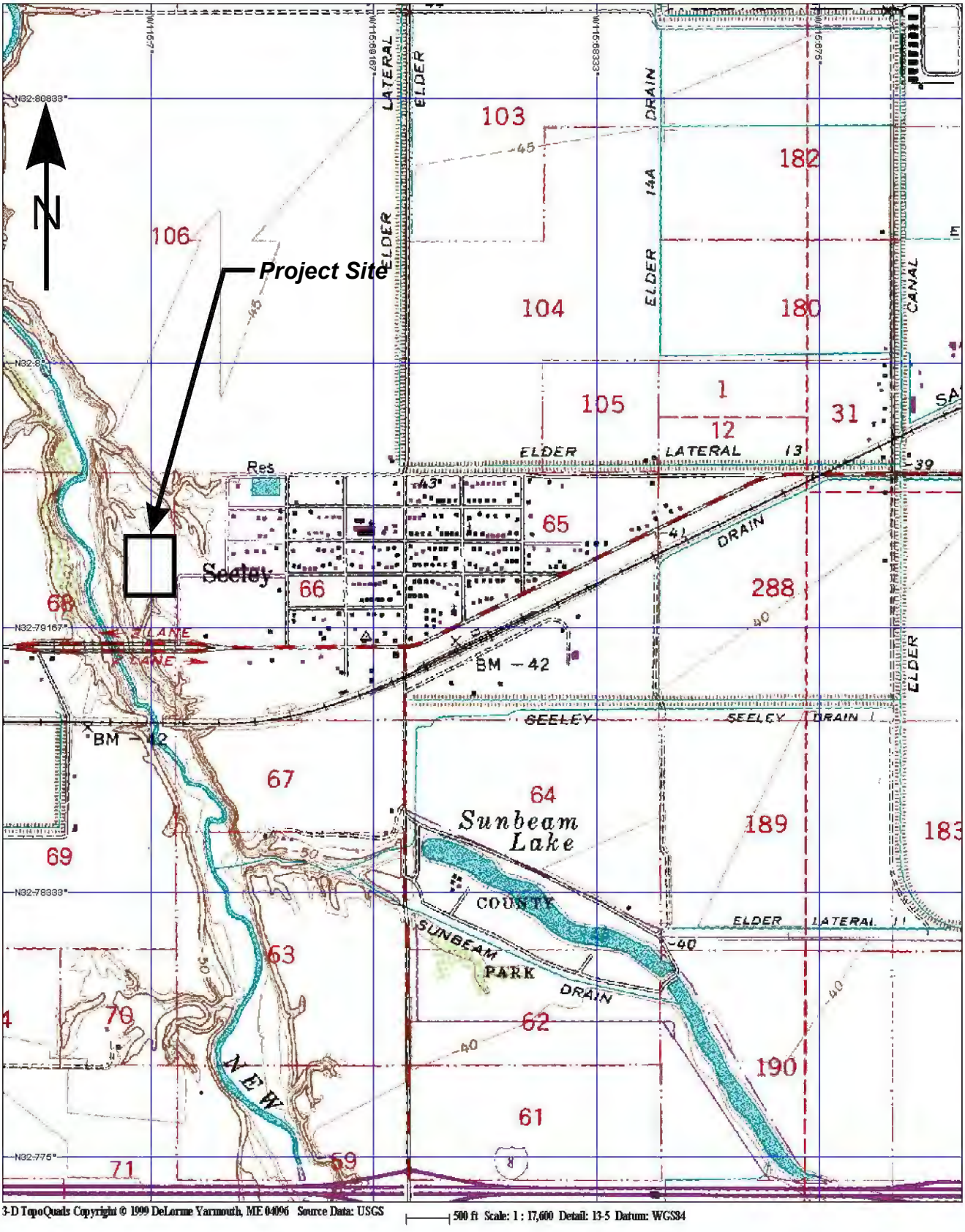
Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
121---------- Meloland	0-12	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122---------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*:											
Meloland----------	0-12	Loam----------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125---------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126---------- Niland	0-23	Fine sand-------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127---------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*:											
Niland----------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131---------- Rositas	0-27	Sand----------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133, 134, 135-Rositas	0-9	Fine sand-------	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
Rositas	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137----------	0-12	Silt loam-------	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
Rositas	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139----------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
Superstition	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142----------	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
Vint	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143----------	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
Vint	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint----------	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio----------	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.



LANDMARK
Geo-Engineers and Geologists

Project No.: LE21017

Topographic Map

Plate A-4

APPENDIX B

LOG OF BORING No. B-1

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SILTY CLAY/CLAYEY SILT (CL-ML): Brown, dry to moist, stiff, low to medium plasticity			LL=27% PI=6%
5			12		SILTY SAND (SM): Light brown, very moist, medium dense to dense, very fine grained sand.		5.3	Passing #200 = 30.7%
10			45			97.6	7.6	c=0.27 tsf Φ=26° % passing #200 = 14.9%
15			8	2.5	SILTY CLAY/CLAY (CL-CH): Reddish brown, very moist, stiff, medium to high plasticity			
20			17	1.0		95.3	28.9	c=0.66 tsf
25			9	1.5			31.2	LL=52% PI=32%
30			12	2.0		91.0	32.6	c=0.69 tsf
35			12	2.5				
40			12	2.0				
45			9	2.5				
50			10	1.5	Some very fine grained sand			
55					Groundwater measured at 40.5 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
60								

DATE DRILLED: 2/16/21 | TOTAL DEPTH: 51.5 Feet | DEPTH TO WATER: 40.5 ft.

LOGGED BY: J. Avalos | TYPE OF BIT: Hollow Stem Auger | DIAMETER: 8 in.

SURFACE ELEVATION: Approximately -45' | HAMMER WT.: 140 lbs. | DROP: 30 in.

PROJECT No. LE21017

LANDMARK Geo-Engineers and Geologists

PLATE B-1

LOG OF BORING No. B-2

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SILTY CLAY/CLAYEY SILT (CL-ML): Brown, dry to moist, stiff, low to medium plasticity			LL=24% PI=4%
5			32		SANDY SILT/SILTY SAND (SM-ML): Light brown, moist, medium dense, very fine grained sand.		4.5	Passing #200 = 31.3%
10			11		Saturated		29.3	% passing #200 = 52.3%
15			15	1.5	SILTY CLAY/CLAY (CL-CH): Reddish brown, very moist, medium stiff to stiff, medium to high plasticity	91.8	31.2	c=0.63 tsf
20			8	2.0			29.8	LL=38% PI=22%
25			21	2.5				
30			6	2.5				
35			22	1.5				
40			10	2.0	Some very fine grained sand ▼			
45			9	2.5				
50			10	2.5				
55					Groundwater measured at 41.7 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
60								

DATE DRILLED: 2/16/21 | TOTAL DEPTH: 51.5 Feet | DEPTH TO WATER: 41.7 ft.

LOGGED BY: J. Avalos | TYPE OF BIT: Hollow Stem Auger | DIAMETER: 8 in.

SURFACE ELEVATION: Approximately -45' | HAMMER WT.: 140 lbs. | DROP: 30 in.

PROJECT No. LE21017

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PLATE B-2

DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS	
Coarse grained soils More than half of material is larger that No. 200 sieve	**Gravels**	Clean gravels (less than 5% fines)		**GW**	Well graded gravels, gravel-sand mixtures, little or no fines
	More than half of coarse fraction is larger than No. 4 sieve			**GP**	Poorly graded gravels, or gravel-sand mixtures, little or no fines
		Gravel with fines		**GM**	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
				**GC**	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	Sands	Clean sands (less than 5% fines)		**SW**	Well graded sands, gravelly sands, little or no fines
	More than half of coarse fraction is smaller than No. 4 sieve			**SP**	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines		**SM**	Silty sands, sand-silt mixtures, non-plastic fines
				**SC**	Clayey sands, sand-clay mixtures, plastic fines
Fine grained soils More than half of material is smaller than No. 200 sieve	**Silts and clays**			**ML**	Inorganic silts, clayey silts with slight plasticity
	Liquid limit is less than 50%			**CL**	Inorganic clays of low to medium plasticity, gravely, sandy, or lean clays
				**OL**	Organic silts and organic clays of low plasticity
	Silts and clays			**MH**	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts
	Liquid limit is more than 50%			**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

GRAIN SIZES

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		
200	40	10	4	3/4"	3"	12"	

US Standard Series Sieve — Clear Square Openings

Sands, Gravels, etc.	Blows/ft. *
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Clays & Plastic Silts	Strength **	Blows/ft. *
Very Soft	0-0.25	0-2
Soft	0.25-0.5	2-4
Firm	0.5-1.0	4-8
Stiff	1.0-2.0	8-16
Very Stiff	2.0-4.0	16-32
Hard	Over 4.0	Over 32

* Number of blows of 140 lb. hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 in. I.D.) split spoon (ASTM D1586).

** Unconfined compressive strength in tons/s.f. as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D1586), Pocket Penetrometer, Torvane, or visual observation.

Type of Samples:

Ring Sample — Standard Penetration Test — Shelby Tube — Bulk (Bag) Sample

Drilling Notes:

1. Sampling and Blow Counts
   - Ring Sampler - Number of blows per foot of a 140 lb. hammer falling 30 inches.
   - Standard Penetration Test - Number of blows per foot.
   - Shelby Tube - Three (3) inch nominal diameter tube hydraulically pushed.
2. P. P. = Pocket Penetrometer (tons/s.f.).
3. NR = No recovery.
4. GWT ▼ = Ground Water Table observed @ specified time.

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Key to Logs

Plate B-3

APPENDIX C

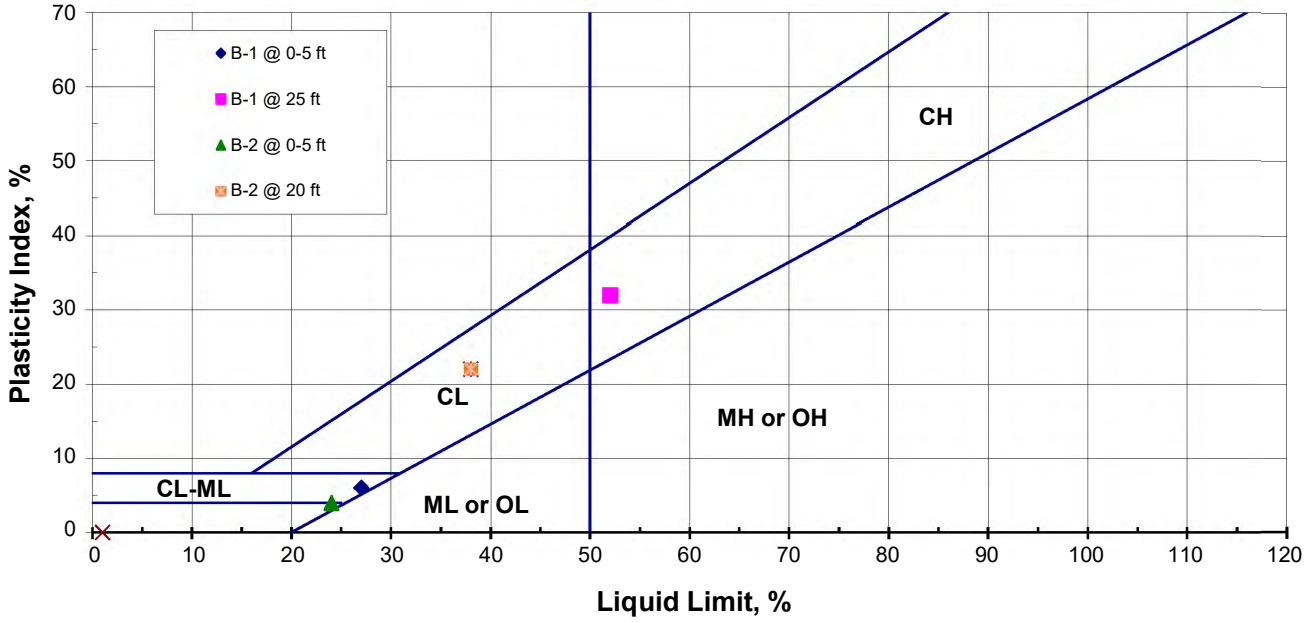
LANDMARK CONSULTANTS, INC.

CLIENT: Hazen & Sawyer
PROJECT: Seeley WWTP Improvements
JOB No.: LE21017
DATE: 02/23/21

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classification
B-1	0-5	27	21	6	CL
B-1	25	52	20	32	CH
B-2	0-5	24	20	4	CL
B-2	10	NL	NP	NLL-NPL	ML
B-2	20	38	16	22	CL

PLASTICITY CHART



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Atterberg Limits Test Results

Plate C-1

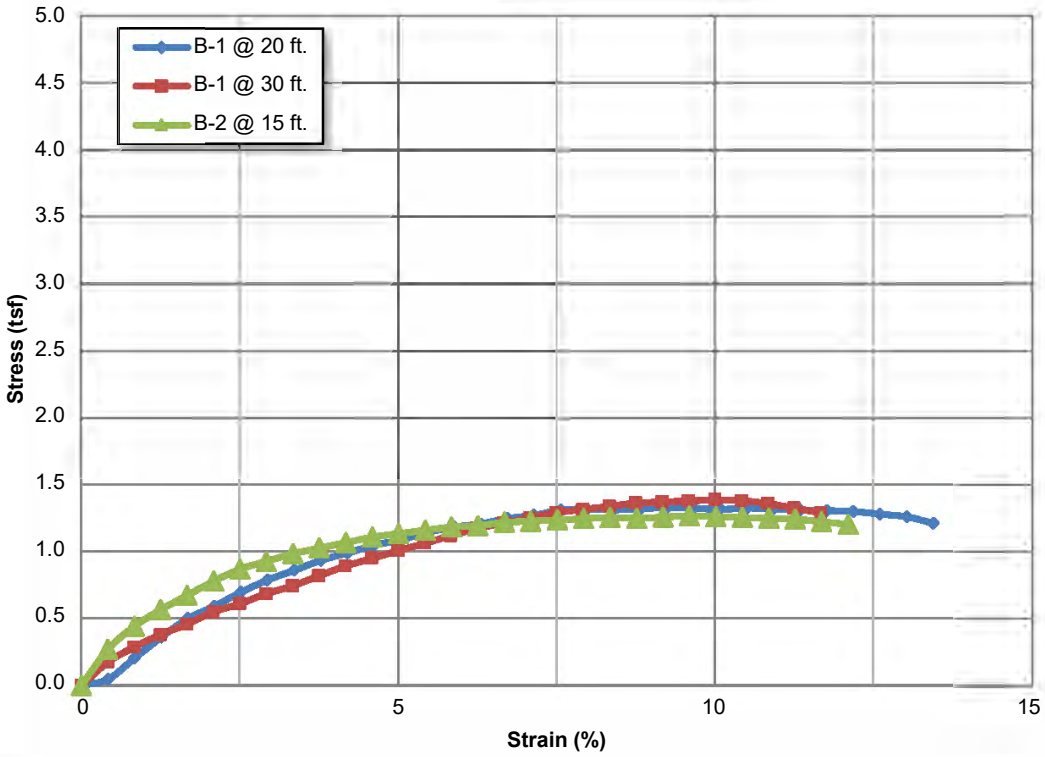
LANDMARK CONSULTANTS, INC.

CLIENT: Hazen and Sawyer
PROJECT: Seeley WWTP Improvements - Seeley, CA
JOB NO: LE21017
DATE: 2/22/2021

UNCONFINED COMPRESSION TEST (ASTM D2166)

Boring No.	Sample Depth (ft)	Natural Moisture Content (%)	Unit Dry Weight (pcf)	Maximum Compressive Strength (tsf)	Cohesion (tsf)	Failure Strain (%)
B-1	20	28.9	95.3	1.33	0.66	9.2
B-1	30	32.6	91.0	1.39	0.69	10.0
B-2	15	31.2	91.8	1.27	0.63	9.6

Stress - Strain Plot



LANDMARK Geo-Engineers and Geologists

Project No.: LE21017

Unconfined Compression Test Results

Plate C-2

LANDMARK CONSULTANTS, INC.

CLIENT: Hazen and Sawyer
PROJECT: Seeley WWTP Improvements
PROJECT No: LE21017 **DATE:** 2/22/2021

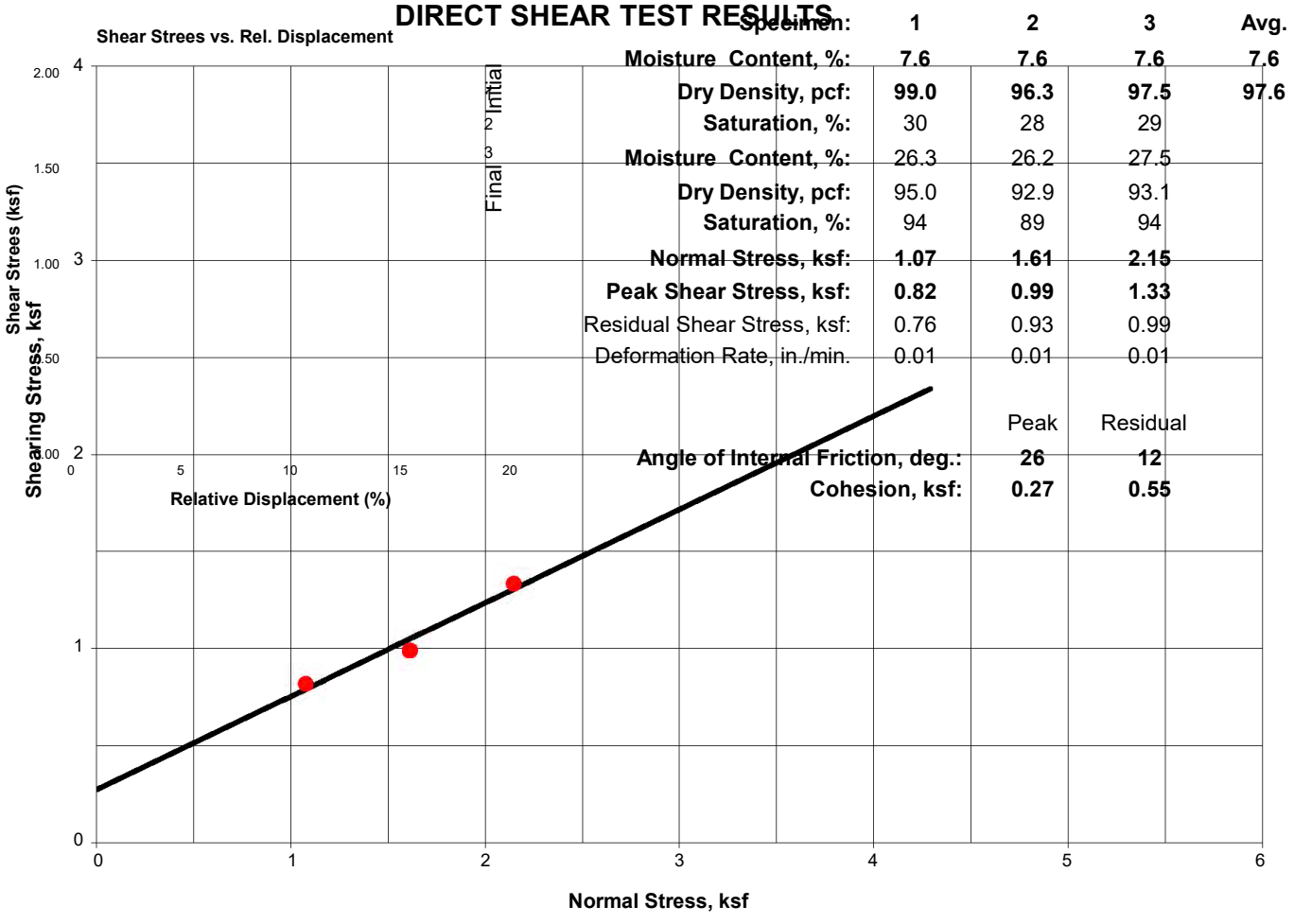
DIRECT SHEAR TEST - INSITU (ASTM D3080)

SAMPLE LOCATION: B-1 @ 10 ft
SAMPLE DESCRIPTION: Silty Sand (SM)

Angle of Internal Friction: 26º
Cohesion: 0.27 ksf
Initial Dry Density: 97.6 pcf
Initial Moisture Content: 7.6%

DIRECT SHEAR TEST RESULTS

Specimen:	1	2	3	Avg.
Moisture Content, %:	**7.6**	**7.6**	**7.6**	**7.6**
Dry Density, pcf:	**99.0**	**96.3**	**97.5**	**97.6**
Saturation, %:	30	28	29	
Moisture Content, %:	26.3	26.2	27.5	
Dry Density, pcf:	95.0	92.9	93.1	
Saturation, %:	94	89	94	
Normal Stress, ksf:	**1.07**	**1.61**	**2.15**	
Peak Shear Stress, ksf:	**0.82**	**0.99**	**1.33**	
Residual Shear Stress, ksf:	0.76	0.93	0.99	
Deformation Rate, in./min.	0.01	0.01	0.01	
		Peak	Residual	
Angle of Internal Friction, deg.:		**26**	**12**	
Cohesion, ksf:		**0.27**	**0.55**	



LANDMARK Geo-Engineers and Geologists	Direct Shear Test Results	Plate C-3
PROJECT No: LE21017		

LANDMARK CONSULTANTS, INC.

CLIENT: Hazen & Sawyer
PROJECT: Seeley WWTP Improvements
JOB No.: LE21017
DATE: 02/23/21

CHEMICAL ANALYSIS

	Boring:	B-1	B-2	Caltrans Method
	Sample Depth, ft:	0-5	0-5	
pH:		7.83	8.01	643
Electrical Conductivity (mmhos):		---	---	424
Resistivity (ohm-cm):		310	530	643
Chloride (Cl), ppm:		1,240	1,180	422
Sulfate (SO4), ppm:		804	1,500	417

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Range of Values	Degree of Corrosivity
Concrete	Soluble Sulfates (ppm)	0 - 1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides (ppm)	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity (ohm-cm)	1 - 1,000	Very Severe
		1,000 - 2,000	Severe
		2,000 - 10,000	Moderate
		> 10,000	Low

LANDMARK
Geo-Engineers and Geologists

Project No.: LE21017

Selected Chemical Test Results

Plate C-4

APPENDIX D

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Improvement - Seeley, CA
Project No.: LE21017
Location: B-1

Maximum Credible Earthquake	7.4		**Borehole Diameter**	8	in.
Design Ground Motion	0.65	g	**Rod Length**	3	ft.
Total Unit Weight,	110	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	85		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data						Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer
Depth		Blow Counts		Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence
(ft)	(m)	SPT	Mod. Cal.	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)
5	1.52	12		1	26.33	1	12	1.42	1.15	0.75	1.0	1.70	25	60	30.53	0.45		10.00	0.00
10	3.05		45	1	52.64	1	45	1.42	1.15	0.80	1.0	1.11	65	15	68.54	10.00	0.57	10.00	0.00
15	4.57	8		0	64.03	1	8	1.42	1.15	0.85	1.0	1.26	14	90	19.43	0.17	0.47	0.37	0.00
20	6.10		17	0	75.43	1	17	1.42	1.15	0.95	1.0	1.11	29	90	34.84	0.93	0.50	1.87	0.00
25	7.62	9		0	86.82	1	9	1.42	1.15	0.95	1.0	1.08	15	90	20.53	0.18	0.57	0.32	0.00
30	9.14		12	0	98.22	1	12	1.42	1.15	1.00	1.0	1.01	20	90	25.34	0.26	0.60	0.43	0.00
35	10.67	12		0	109.62	1	12	1.42	1.15	1.00	1.0	0.97	19	90	24.38	0.24	0.62	0.39	0.00
40	12.19		12	0	121.01	1	12	1.42	1.15	1.00	1.0	0.92	18	90	23.54	0.22	0.63	0.35	0.00
45	13.72	9		0	132.41	1	9	1.42	1.15	1.00	1.0	0.87	13	90	18.31	0.16	0.64	0.25	0.00
50	15.24	10		0	143.80	1	10	1.42	1.15	1.00	1.0	0.84	14	90	19.19	0.17	0.65	0.26	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils*, Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) **0.00**

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Improvement - Seeley, CA
Project No.: LE21017
Location: B-2

Maximum Credible Earthquake	7.4		**Borehole Diameter**	8	in.
Design Ground Motion	0.65	g	**Rod Length**	3	ft.
Total Unit Weight,	110	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	85		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data						Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer
Depth		Blow Counts		Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence
(ft)	(m)	SPT	Mod. Cal.	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)
5	1.52		32	1	26.33	1	32	1.42	1.15	0.75	1.0	1.35	53	60	58.56	10.00		10.00	0.00
10	3.05	11		1	52.64	1	11	1.42	1.15	0.80	1.0	1.34	19	30	24.58	0.24	0.37	0.66	0.99
15	4.57		15	0	64.03	1	15	1.42	1.15	0.85	1.0	1.20	25	90	30.48	0.45	0.44	1.01	0.00
20	6.10	8		0	75.43	1	8	1.42	1.15	0.95	1.0	1.16	14	90	19.84	0.18	0.53	0.33	0.00
25	7.62		21	0	86.82	1	21	1.42	1.15	0.95	1.0	1.05	34	90	39.74	3.29	0.54	6.04	0.00
30	9.14	6		0	98.22	1	6	1.42	1.15	1.00	1.0	1.02	10	90	15.46	0.14	0.60	0.23	0.00
35	10.67		22	0	109.62	1	22	1.42	1.15	1.00	1.0	0.97	35	90	40.44	4.13	0.62	6.72	0.00
40	12.19	10		0	121.01	1	10	1.42	1.15	1.00	1.0	0.92	15	90	20.46	0.18	0.63	0.29	0.00
45	13.72		9	0	132.41	1	9	1.42	1.15	1.00	1.0	0.87	13	90	18.31	0.16	0.64	0.25	0.00
50	15.24	10		0	143.80	1	10	1.42	1.15	1.00	1.0	0.84	14	90	19.19	0.17	0.65	0.26	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils*, Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) **0.99**

Preliminary Draft
Environmental Package – State Water Resources Control Board
Division of Financial Assistance

Seeley County Water District Wastewater Treatment Plant Improvements
October 2021

Attachment 2: Preliminary Engineering Report

Hazen *Technical Memorandum*

December 31, 2020

To: Miriam Rosales, Seeley County Water District

Aaron Garcia, Seeley County Water District

From: Gregg Cummings, PE; Brad Reisinger, PE; Hallie Thornburrow, EIT; Wyatt Dressler, PE: Danny Loza, EIT; Michael Burba, EIT

Reviewed by: Kevin Alexander, PE; Alan Mlakar, PE; Sean DuPuis, PE, Joe Rohrbacher, PE, Derya Dursun, PhD, PE

Re: Seeley County Water District WWTP Draft PER

Seeley County Water District Wastewater Treatment Plant Improvements Preliminary Engineering Report (DRAFT)

Introduction

The Seeley County Water District (District) operates a 0.25 million gallon per day design capacity Wastewater Treatment Plant (WWTP) located in Seeley, Imperial County, California. The WWTP is being improved to address effluent permit violations which resulted in notices of noncompliance, including an Administrative Civil Liability Complaint and Time Schedule Order. Seeley has received a Clean Water Small Community Planning Loan from the State Clean Water Revolving Fund with 100% Principal Forgiveness if they comply with the requirements of the Loan. This Preliminary Engineering Report (Draft) is to comply with the loan submittal requirements and summarizes the proposed improvements to the WWTP.

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Appendix A – NPDES Permit

Appendix B – MBR: Information from Vendor

Appendix C – Biolac®: Information from Vendor

Appendix D – Cost Estimate

Appendix E – Preliminary Treatment Alternative Layout Figures

1. Introduction

The Seeley County Water District (District) provides water and wastewater services to the residents of Seeley, California, located in Imperial County near El Centro, **Figure 1-1**. The District collects and treats mostly residential wastewater from the town of Seeley with a population of approximately 2,100. The wastewater treatment plant is designed for a treatment capacity of 0.25 million gallons per day (mgd) with current average daily flows of 0.11 mgd. The plant consists of an influent lift station, an aerated pond treatment system with a primary pond (Pond 2) with surface aerators followed by five Clemson ponds with surface aerators, effluent pumping, pre-disinfection pressure sand filters, and an ultraviolet (UV) disinfection system prior to discharge to the New River, **Figures 1-2** and **1-3**.

A septage receiving facility is located to the influent lift station and discharges into the sewer prior to entering the wastewater treatment plant. Improvements to the septage receiving station are being completed under a separate project, however, improvements and effects on the WWTP Improvements Project are described herein.



Figure 1-1: Location Map

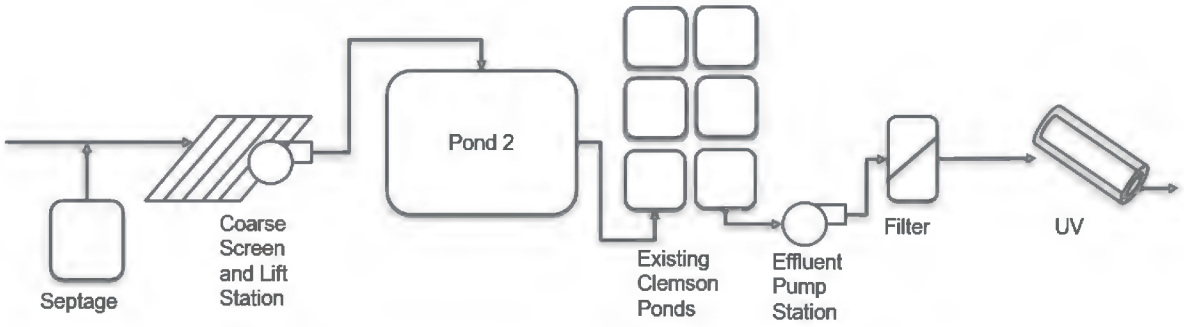


Figure 1-2: Existing Process Flow Diagram

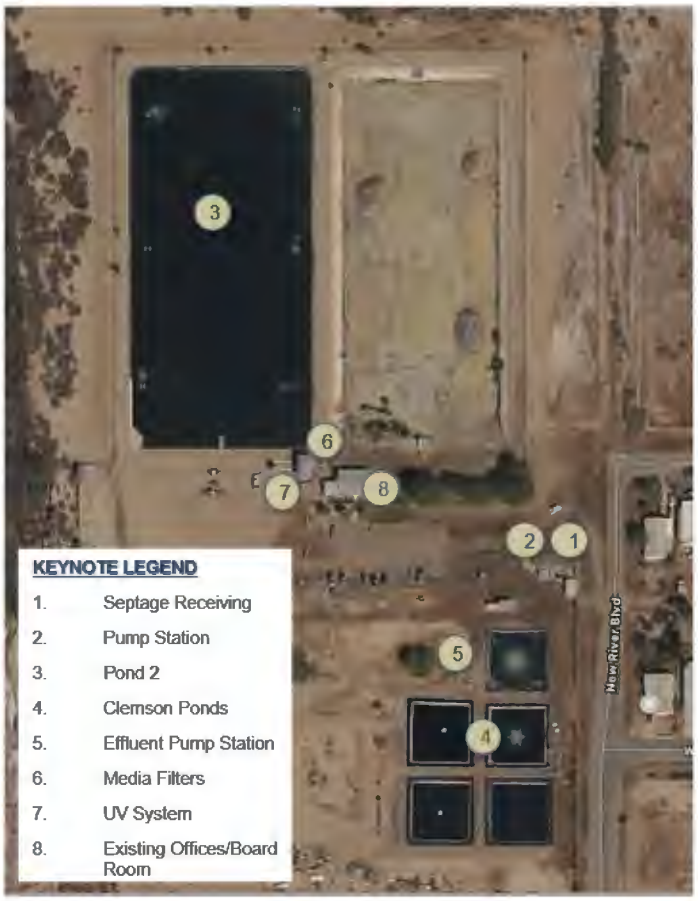


Figure 1-3: Existing Site Layout

The Clemson process facilities (comprised of Clemson ponds, or reaction basins) were constructed and put into operation in 2004. In 2014, one of the original 2.4-acre upstream lagoons (Pond 2, or the west pond) was retrofitted with a liner and modifications to a primary oxidation pond upstream of the Clemson

facilities. Wastewater currently enters the primary oxidation pond before overflowing and being directed through the Clemson ponds and eventually discharged through an outfall to the New River.

The Colorado River Basin Regional Water Quality Control Board (RWQCB) issued several notices of noncompliance to the District on August 8, 2017. The RWQCB identified a failure to comply with the effluent requirements in the District's permit for free cyanide, biochemical oxygen demand (5-day @ 20ºC, BOD_5), enterococci, and fecal coliforms for December 2016. Additionally, the plant exceeded the limits for BOD_5 during January 2017. Copper effluent requirements were added to the latest National Pollutant Discharge Elimination System (NPDES) permit, which was adopted in 2017; copper violations were reported when the permit was first adopted, however no copper violated have been reported in recent years. A copy of the current NPDES Permit is included in **Appendix A**.

The following improvements to improve treatment performance and increase reliability of the Seeley Wastewater Treatment Plant (WWTP) were discussed with JHK Consulting and the District:

- Upgrade the secondary treatment system with one of two options:
  - Alternative 1 – install a membrane bioreactor (MBR) **Figures 1-4** and **1-5**.
  - Alternative 2 – install a new Biolac® process, **Figures 1-6** and **1-7**.
- Install a new Operations Building to house some laboratory and office space.
- Sludge handling via drying beds.
- Electrical improvements, including improvements to the 480V service by increasing the 225 A service to a 400A service. Addition of 75kW or more of generator capacity above the existing 125 kW generator installed in 2009 to accommodate the new secondary treatment. Add another automatic transfer switch and distribution panel, direct bury duct banks, resupply existing building, office/lab, Ultraviolet (UV) and Pond 2 Aerators.
- Instrumentation and controls for the new secondary treatment process.

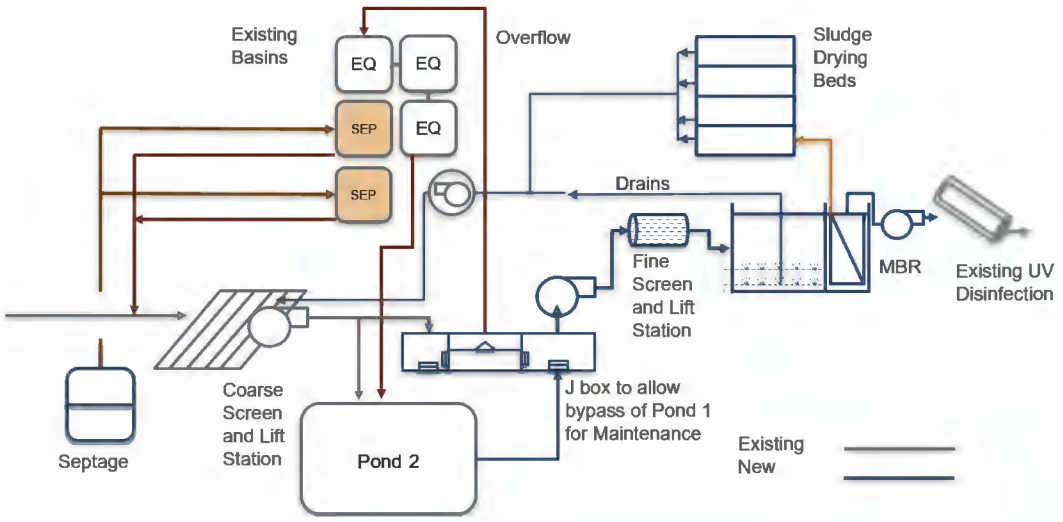


Figure 1-4: Alternative 1 Preliminary Process Flow Diagram – MBR



Figure 1-5: Alternative 1 Preliminary Site Layout – MBR

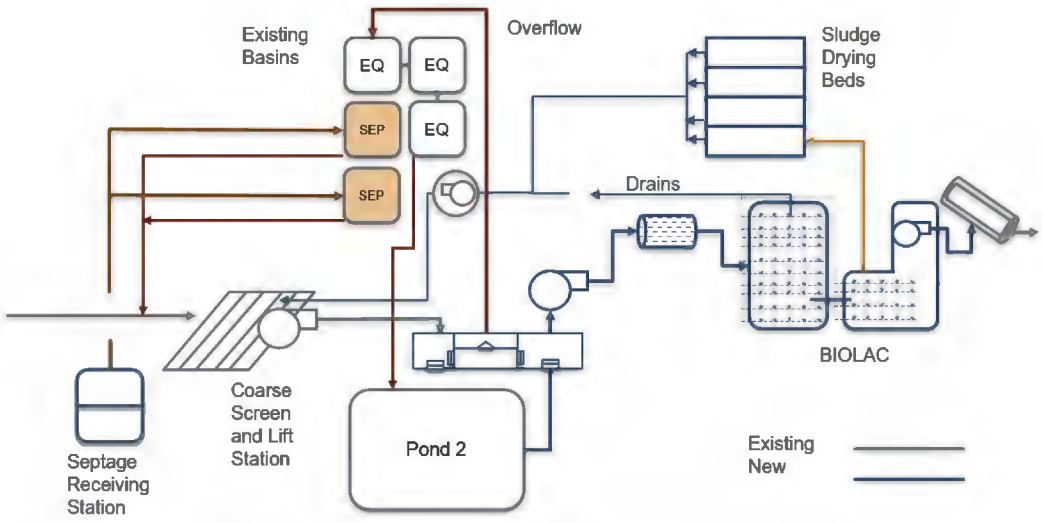


Figure 1-6: Alternative 2 Preliminary Process Flow Diagram – Biolac®



Figure 1-7: Alternative 2 Preliminary Site Layout – Biolac®

An agreement (Fiscal Agreement SWRCB D1901022) was executed between the District and the California State Water Resources Control Board (SWRCB) on August 5, 2020 to provide the District with a Planning Loan to help implement the WWTP improvements. This Preliminary Engineering Report summarizes the proposed project for addressing effluent permit violations for free cyanide, BOD_5, enterococci, fecal coliforms, and copper.

2. Site Investigations

As part of the design process, three site investigations will be conducted as described below. The results of these investigations will be included in the final PER submission.

2.1 Topographic Survey

Fuscoe Engineering, Inc. will be retained to conduct a topographic survey for the site. The survey scope of work consists of field survey data collection of topographic and planimetric information and field survey control of the area indicated on **Figure 2-1**. The survey will be conducted using aerial drone and field surveying, with the requirement that the final product will be certified by the Professional Land Surveyor with direct oversight of the work as to the required level of accuracy noted below. The area to be surveyed is generally within the deeded boundary of the Seeley WWTP.



Figure 2-1: Limits of Survey

The survey data collected will be located and identified in the submitted Survey Drawing(s) including the location, dimension, and materials of all structures, foundations, roadways, sidewalks, fences, and other

above-ground structures / construction within the proposed survey limits. The survey shall also include the species and location of existing trees with a diameter at breast height (DBH) greater than or equal to 4 inches. The survey shall include the location, size, material, rim, and invert elevation of existing storm drainage piping, structures, and outfalls, and sanitary sewer piping and manholes within the survey area. Limits and elevation of 100-year floodplain and floodway within area of survey, if applicable, shall be provided. Any existing natural drainage features, streams, creeks, rivers, ponds, or lakes shall be generally located. Any areas of observed surface water ponding on site shall be noted. Survey shall include locations of all boring locations and staked stream and/or wetlands delineation flagging as may be present within the limits of survey.

2.2 Geotechnical Investigation

LandMark Geo-Engineers and Geologists will be retained to conduct a geotechnical investigation, generally within the same limits as the topographic survey (see **Figure 2-1**). The geotechnical scope of work will consist of reviewing existing information, conducting a field investigation, and preparing a geotechnical report:

1. Review available previous geotechnical investigations performed for the WWTP site and determine if this information can be used for the existing design. Hazen will coordinate with the District to obtain existing geotechnical information.

2. Conduct a geotechnical investigation for the site:
    a. Work with Hazen to identify two locations for exploratory borings. Hazen will then confirm these locations with the District.
    b. Coordinate underground utilities locating for the two exploratory boring sites, based on a review of existing information provided by the District. Include budget for one day of utility locating services.
    c. Obtain a permit for the drilling from Imperial County.
    d. Obtain clearance form Underground Service Alert (USA) and the private locator.
    e. Confirm locations of boring with District, and drill, log, and sample two 4-inch to 6-inch exploratory borings to depths of 40 to 45 feet, or to competent bedrock whichever is encountered first. Borings shall be extended a few feet into bedrock for evaluation of rock excavation potential. Backfill the borings with grout in accordance with Imperial County requirements
    f. Collect samples at 5-foot intervals in the borings by driving either a split-spoon sampler or a modified California sampler. The former will be used to collect samples of the surficial fill (granular soil) and bedrock (i.e., disturbed samples) in plastic bags. The latter will be used to collect undisturbed samples of the native soil in stainless-steel tube liners. Transport the samples to laboratory for classification and analysis of selected representative samples.
    g. Characterize bedrock (e.g., rock type, fracturing, hardness) based on observations of nearby visible cut slopes, if possible.
    h. Conduct laboratory analyses of selected representative samples obtained from the borings including the following tests:
        i. Classification and index tests such as sieve analysis and Atterberg Limits determinations. Granular soils obtained from the borings shall be tested for

gradation for use in liquefaction evaluation if applicable.
   ii. Moisture content and dry density determinations to aid in the qualitative evaluation of the soil types encountered and their strength characteristics.
   iii. Strength tests to provide data for bearing capacity and slope stability.
   iv. Consolidation tests to determine the soil compressibility in consideration to settlement evaluation.
   v. Corrosivity test for determination of corrosion potential of the subsurface materials for use in determining corrosion protection measures for pipes and equipment, as well as reaction with proposed structure foundations.

i. Develop geotechnical conclusions and recommendations, including those for excavation, earthwork, foundations, walkways, pavements, pipelines, underground vaults, retaining walls, and seismic design criteria.
j. Prepare a report summarizing the investigation, findings, conclusions, and recommendations, including but not limited to the following:
   i. Description of the physical properties, general site conditions, and characteristic of the subsurface soils including groundwater level and possible seasonal variations in the level. The logs of the exploratory boreholes will present the depth of various soil layers.
   ii. General stie geology, seismicity, and liquefaction potential with a summary of California Building Code (CBC) 2017 and International Building Code (IBC) 2017 site parameters.
   iii. Recommendations for excavation and site earthwork including procedures for subgrade preparation for foundation, slab-on-grade, pavement, buried pipelines, and underground vault structures.
   iv. Estimation of expected total and differential settlements in consideration to design of building foundations, pipelines, underground vaults, slab-on-grade structures, and pavements.
   v. Foundation design recommendations including allowable bearing pressures for shallow foundation, retaining walls, and underground vaults, allowable uplift resistance, allowable passive resistance soil against the foundations and coefficient of friction between the soil and foundations for lateral resistance calculations including wind and seismic.
   vi. Recommendations for construction procedures and practices related to earthwork including excavation, trenching, bedding, backfill, compaction, subgrade preparation, temporary shoring, excavation dewatering, and evaluation of existing excavated materials and suitability for project use as fill materials, grading, foundation and pavements.
   vii. Recommendations for the design and construction of asphalt concrete (AC) and Portland cement concrete (PCC) pavement sections.

2.3 Utility Research

Hazen will conduct utility research by reviewing available record drawings, conducting site visits, and meeting with District staff. If additional information is required, then a potholer and/or utility locator will be retained to obtain additional data.

3. Existing Wastewater Treatment Plant Documents and Influent Water Quality Data

3.1 Design Flow Criteria

Seeley County Water District provided approximately three and a half years of monthly influent data from January 2017 through July 2020. The monthly average flow, maximum daily flow, and minimum daily flow were provided for each month during this time period.

Wastewater flows can fluctuate greatly depending on the time of day or time of year. The provided values were analyzed in order to produce peaking factors that were used to appropriately size the treatment alternatives that are being evaluated. **Table 3-1** below includes a summary of the flows and peaking factors and a brief description of how each condition was determined. **Figure 3-1** shows a graphical summary of the available data which used for this analysis.

Table 3-1: Current Flows and Peaking Factors

Parameter	Flow (mgd)	Peaking Factor	Basis of Flow Rate
Average Day	0.114	1	Average of the monthly average data
Maximum Month	0.133	1.17	99th percentile of the monthly average data
Maximum Day	0.155	1.36	Max peak flow per day divided by the average of monthly flow rates.
Minimum Day	0.03	0.27	Min daily flow reported divided by the average of monthly average flow rates.
Peak Hour	0.454	4.00	From published reference, assuming a population of 2,000 people (Metcalf and Eddy's Wastewater Engineering Treatment and Reuse, 4th edition)..

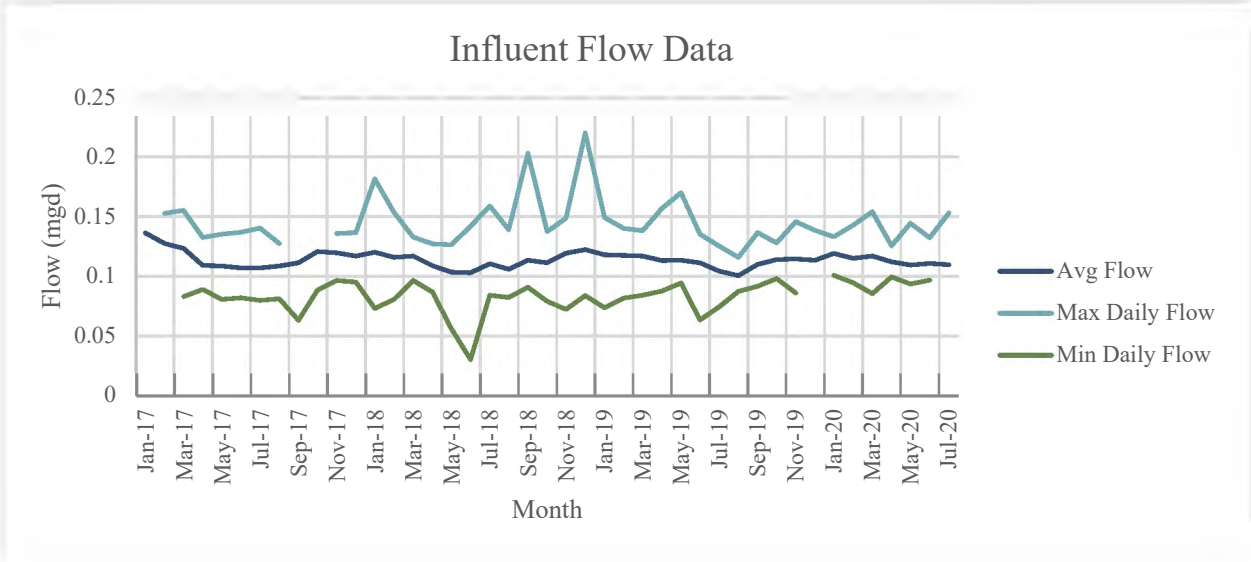


Figure 3-1 Influent Flow Data

The current data and population growth historic data and assumptions were used to project the flow out to year 2040. These calculations assumed a population growth of 3.8 percent over 10 years (U.S. Census Bureau, Population Division) in addition to the population increase from the new Coyne Ranch home development, which is planned for the near future. An additional 662 new homes are anticipated to be constructed as part of this development according to Fuscoe Engineering's *Water Supply Assessment Study for Coyne Ranch (*2016). An average value of 3.6 persons per household was taken from GEI Consultant's *Imperial Integrated Regional Water Management Plan* (2012) and used to calculate the estimated population growth from the new development. The natural population growth (not attributed to the new development) was assumed to be exponential and used the 3.8 percent value compounded every 10 years. These calculations assume that the average flow to the Seeley WWTP will be over double by the year 2040. A summary of the predicted future flows is included below in **Table 3-2**. It should be noted that the peaking factors for the current data, presented in **Table 3-1,** were used to calculate the maximum, minimum and peak future flows.

Table 3-2: Projected 2040 Flows

Parameter	Flow (mgd)
Average Day	0.25
Maximum Month	0.29
Maximum Day	0.33
Minimum Day	0.07
Peak Hour	0.98

3.2 Influent Wastewater Characteristics

Seeley County Water District provided approximately three and a half years of weekly average influent data from January 2017 through July 2020 for total suspended solids (TSS) and BOD_5. Weekly data was used to generate the average concentration and loadings, which are shown below in **Table 3-3. Figure 3-2** shows a graphical summary of the available data which used for this analysis.

Table 3-3: Average BOD_5 and TSS Concentrations and Loads

Parameter	Average Influent Concentration (mg/L)	Average Influent Load (lbs./day)
BOD_5	455	430
TSS	310	293

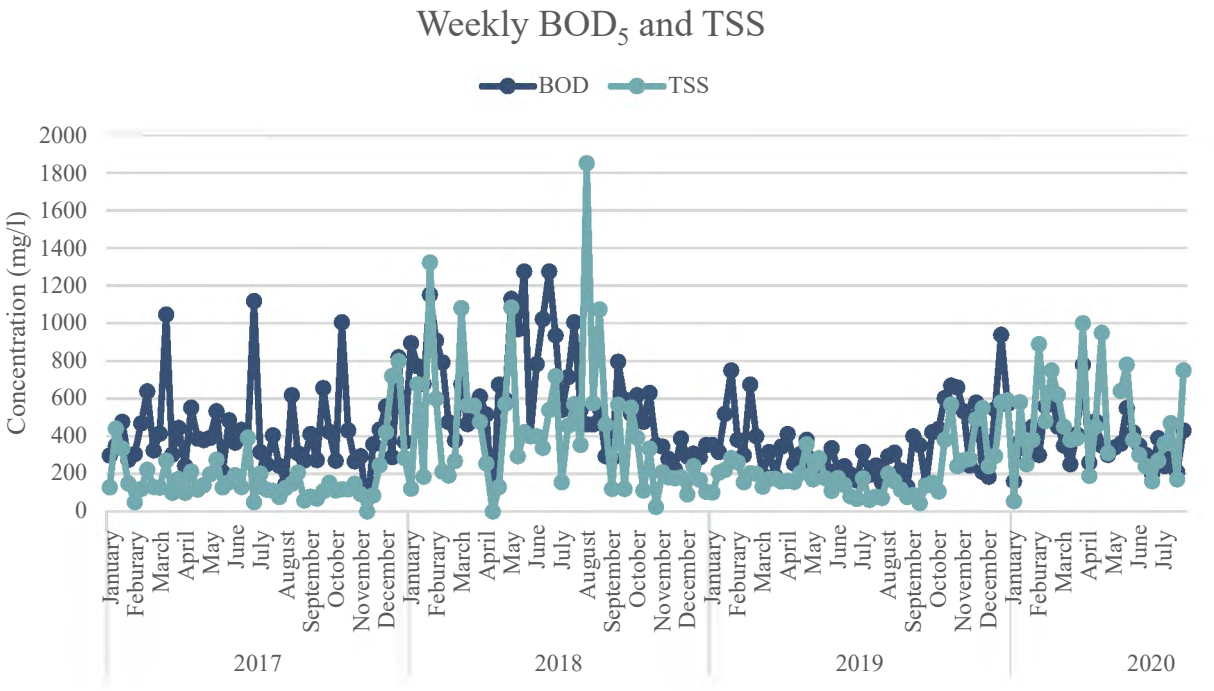


Figure 3-1 Influent Water Quality Data

Table 3-4 below summarizes the peaking factors calculated for BOD_5 and TSS in the plant influent. According to the Water Environment Federation (WEF) *Introduction to Water Resource Recovery Facility Design*, 2nd Edition (2015), typical values for maximum day and maximum month peaking factors are 1.6 and 1.3, respectively for BOD_5 and 1.9 and 1.3 respectfully. The calculated peaking factors based on historical data presented below in Table 3-4. The high peaking factors could be explained by large slugs of septage being dumped at once, additionally the lack of daily data may have an impact on the higher numbers. Note that the proposed modifications to the septage receiving station mentioned in Section 1 (which is not included in the scope of this project) are anticipated to help reduce the loading peaks, however these changes were not taken into account for this analysis.

Table 3-4: Calculated BOD_5 and TSS Peaking Factors

Parameter		Concentration (mg/L)	Peaking Factor	Basis of Flow Rate
BOD_5	Maximum Month	978.7	2.15	99th percentile of the monthly average concentration average data for the three-year data set
	Maximum Week	1044.9	2.3	97th percentile of the weekly average data for the three-year data set
	Minimum Week	144.2	0.32	1st percentile of the weekly average data for the three-year data set
TSS	Maximum Month	862.3	2.78	99th percentile of the monthly average concentration average data for the three-year data set
	Maximum Week	998	3.21	97th percentile of the weekly average data for the three-year data set
	Minimum Week	47.4	0.15	1st percentile of the weekly average data for the three-year data set

Table 3-5 presents the projected 2040 BOD_5 and TSS loads. It is assumed that the BOD_5 and TSS concentrations will remain constant; the increase in loading will be attributed to the increase in flows. The projected loads were calculated by multiplying the projected flow increase and the average influent concentration for each parameter. The load peaking factors established in **Table 3-5** were then used to predict the maximum month, maximum week and minimum week flows from the average loads.

Table 3-5: Future BOD_5 and TSS loads

Parameter	Influent Loads (lbs./day)	
	BOD5	TSS
Average Day	925	630
Maximum Month	2,000	1,750
Maximum Week	2,130	2,020
Minimum Week	300	95

Weekly influent cyanide and copper samples were collected throughout 2019. The ranges of these results are summarized in **Table 3-6**. This data did not provide enough sampling points to perform a peaking factor analysis.

Table 3-6: Copper and Cyanide Concentrations

Parameter	2019 Average (µg/l)
Copper	4 to 150
Cyanide	5 to 48

3.3 Effluent Requirements

The effluent requirements are defined by the NPDES permit Order R7-2107-0016 CA0105023. The full permit is included in **Appendix A**. The effluent exits the plant from the north end and ultimately discharges into the New River via an unnamed tributary. **Table 3-7** summarizes the effluent requirements.

Table 3-7: NPDES Effluent Requirements

Parameter	Units	Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Escherichia Coli (E. coli)	MPN/100 ml	126[3]		400[4]		
Enterococci	MPN/100 ml	33[3]		100[4]		
Fecal coliform	MPN/100 ml	200[3]		400[5]		
Flow	mgd	0.25	---	---		
pH	Standard Units	---	---	---	6.0	9.0
BOD_5	mg/L	45	65	---	---	---
	lbs./day[1]	94	140	---	---	---
TSS	mg/L	45	65	---	---	---
	lbs./day[1]	94	140	---	---	---
Oil and Grease, Total[2]	mg/L	---	---	25	---	---
	lbs./day[1]	---	---	52	---	---
Copper, Total Recoverable	µg/L	25	---	50	---	---
	lbs./day[1]	0.052	---	0.104	---	---
Mercury, Total Recoverable	µg/L	0.051	---	0.102	---	---
	lbs./day[1]	0.0001	---	0.0002	---	---
Cyanide Free	µg/L	4.3	---	8.5	---	---
	lbs./day[1]	0.009	---	0.018	---	---
Bis (2-ethylhexyl) Phthalate	µg/L	5.9	---	12	---	---
	lbs./day[1]	0.012	---	0.025	---	---

1. The mass-based effluent limitations are based on a design capacity of 0.25 mgd
2. Total oil and grease shall include the polar and non-polar fraction of oil great materials
3. This effluent limitation is expressed as a geometric (or log) mean, based on a minimum of not less than five equally spaced samples collected for any 30-day period
4. This effluent limitation is expressed as a maximum single sample value
5. No more than ten percent of the fecal coliform samples collected during any 30-day period shall exceed a MPN of 400 per 1000 milliliter

As previously noted in **Section 1**, effluent permit violations have been reported in the last five years for free cyanide, BOD_5, enterococci, fecal coliforms, and copper, which have resulted in notices of noncompliance, including an Administrative Civil Liability Complaint and Time Schedule Order.

Since these violations, operational changes have been made at the plant to attempt to reduce the concentrations of these parameters in the effluent concentrations. The volume received at the septage vault has been decreased in addition to the use of copper sulfate to control algae growth in the ponds the plant has been discontinued. Additionally, prior to 2016 the plant testing methods for cyanide were not sensitive enough to satisfy permit requirements for cyanide. The testing method has been changed to a more precise method, so the plant can react accordingly when the levels start to become a concern.

The current discharge permit does not include any specific solids requirements. Solids generated by the plant must meet Class B requirements. Under current operating procedures, solids build up in the ponds. When the solids need to be removed, the pond will be drained, and the sludge and debris will be hauled off to a landfill.

4. Treatment Alternatives Evaluation

Two treatment alternatives, membrane bioreactor (MBR) and Biolac®, are being evaluated for the Seeley WWTP wastewater treatment plant improvements project as discussed herein. There is a range of secondary treatment technologies that are available to treat flows and loads similar to what are experienced at Seeley. This report focuses on two technologies that have been or are implemented at agencies in the surrounding area near Seeley. The two technologies will provide treatment that would allow Seeley to meet the NPDES permit requirements, however, the MBR technology will provide superior water quality benefits as compared to the Biolac and would provide Seeley the ability to meet future nutrient regulations and potentially take beneficial use of the water for reuse in the community. Both discussed alternatives will include dewatering. Sludge drying beds were selected as the preferred alternative due to the low operator input requirements, this is described in more detail in **Section 5.1.3**.

4.1 Preliminary Evaluation Criteria

Table 4-1 summarizes the influent flow assumptions and peaking factors that were applied to the preliminary MBR and Biolac® sizing. The average day flow provided to the treatment vendors was increased from the calculated average value of 0.11 mgd that was presented in **Section 3.1** to match the average annual effluent flow from the Seeley County Water District NPDES permit adopted in November 2017. This increased value, provides extra conservatism while giving the vendors a round number. The peaking factors used to calculate the other flow conditions are based on the analysis described in **Section 3.1.** This preliminary evaluation uses current flow values, the treatment system will need to be doubled to accommodate future flows.

Table 4-1: Evaluated Influent Flow Rates

Influent Flow	Flow Rate (mgd)	Peaking Factor
Average Day	0.125	1.00
Maximum Month	0.146	1.17
Maximum Day	0.171	1.36
Peak Hour	0.500	4.00

Table 4-2 summarizes the influent water quality assumptions applied to the preliminary MBR and Biolac® sizing. The influent water quality criteria were derived from historic data influent recorded between January 2017 through August 2020, which was previously summarized in **Section 3.2**. It was assumed that a portion of the influent BOD_5 and TSS would be removed via the Oxidation Pond process which is directly downstream of the headworks and would be upstream of the proposed treatment alternatives once installed. The removal was assumed to be on the low end of standard industry values to be conservative. These values were taken from the Water Environment Federation's *Design of Municipal Wastewater Treatment Plants-Manual Practice No. 8,* 5th Edition (MOP-8) and were assumed 50% removal of TSS and 25% removal of BOD_5. Seeley staff are compiling additional information from previous testing to verify the water quality of the influent and effluent of the oxidation pond. That information will be added once reviewed and confirmed.

The copper and cyanide values are the average of the weekly influent sampling data taken throughout 2019. Values above three standard deviations above the average are not included in the average. The hardness number was taken from the 2018 Water Quality Report for Imperial County..

Table 4-2: Evaluated Influent Water Quality

Constituent	Unit	Value
Temperature	°C	15 to 18 (winter) 33 to 34 (summer)
TSS	mg/L	182
BOD_5	mg/L	376
Cyanide	ug/L	12
Copper	ug/L	43c
Hardness	mg/L	340

4.2 Membrane Bioreactor

4.2.1 Membrane Bioreactor Fundamentals

MBRs incorporate a membrane separation step that replaces the secondary clarifier in the activated sludge process. They offer several advantages including:

- A higher level of filtration separation, resulting in very low turbidity effluent and verifiable levels of microbial removal that is suitable for many reuse applications.
- The filtration process is integrated within the biological process, supporting a reduction in overall plant footprint.
- Biological floc no longer needs to be optimized for gravity settling and consequently Mixed Liquor Suspended Solids (MLSS) concentrations can be higher than conventional systems, resulting in a more compact overall plant footprint.
- Primary and secondary clarification are not required, further reducing plant footprint.
- Can be designed or retrofitted to meet more stringent future discharge requirements, i.e., nutrient removal such as nitrogen and phosphorus.

MBRs do not require primary or secondary clarification but the influent raw wastewater does require a higher level of screening to protect against clogging and damage to the membranes. The associated activated sludge process can be arranged in a number of configurations based on water quality and specifically nutrient removal targets. As secondary clarification is not used as the separation step, the concentration of MLSS can be significantly higher (up to 15,000 mg/L as compared to 4,000 mg/L for conventional clarifiers), which allows a reduces biological tank volume. **Figure 4-1** shows schematically the fundamental differences between conventional activated sludge and MBR treatment.

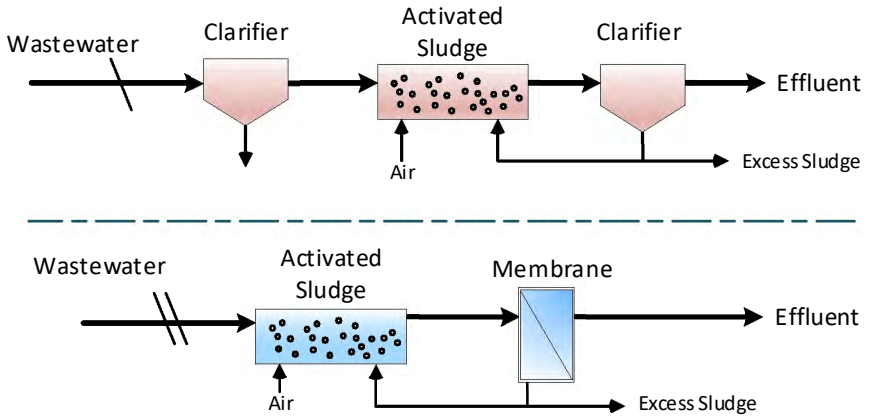


Figure 4-1: Conventional Activated Sludge/MBR Comparison

4.2.2 Biological design considerations

The biological process design for MBR systems is fundamentally the same as for conventional activated sludge, with the exception that it operates at higher MLSS concentrations and shorter hydraulic retention times (HRT). It should be noted that MBR systems are typically designed to fully nitrify to achieve a stable biological process and minimize fouling and optimize membrane filterability.

Other considerations include:

- While early MBR systems were designed with relatively long solid retention times (SRT) (greater than 25 days) systems are now more typically designed consistently with conventional activated sludge processes and specific to the wastewater conditions and treatment objectives. Aerobic SRT is most often selected to provide complete nitrification for the reasons noted previously.
- Return activated sludge (RAS) recirculation rates for MBR systems are higher than conventional (4 to 5 Q as compared to 0.5 to 1 Q), where Q is equal to the feed flow. This is to avoid accumulation of solids in the membrane basin.
- Care should be taken to minimize foaming from filamentous organisms as these can cause fouling of membranes as well as a general plant nuisance. Similar management approaches can be applied as for conventional activated sludge; however, in the case of using anti-foaming agents, compatibility with the membrane material should be verified.
- MLSS concentrations are higher than conventional activated sludge and operate typically in the 8,000 to 12,000 mg/L range. While this has advantages for plant footprint, it should be noted that higher concentrations of MLSS require additional aeration to deliver the same amount of oxygen. Aeration is typically provided by fine bubble diffusers.

4.2.3 Membrane Design Considerations

The membrane design parameters of MBR are developed with close support from membrane vendors.

- The selection of membrane flux (flow per unit area of membrane) determines the amount of membrane area (and hence modules/cassettes) required to achieve production. The selection of flux should be determined on review of operating experience of a particular membrane material and model in similar applications. Flow, temperature and MLSS concentration are minimum requirements for flux selection.

- Fouling control is managed by a range of operational strategies including:

    - Membrane air scouring –Coarse bubble aeration removes solids by agitation of the membranes and scouring action at the membrane surface. This is a high energy consumer. Recent developments with hollow fiber membrane systems have significantly improved air scour techniques and reduced energy consumption.

    - Production cycling –The membranes are either periodically relaxed (in which permeation ceases and the solids material at the membrane surface mix back into the bulk MLSS) and/or a liquid backwash in which permeate is pumped in the reverse direction through the membranes.

    - Chemical cleaning –Includes short duration (0.5 to 2 hours) maintenance cleans in which chemicals (typically chlorine) is introduced from the inside to the outside of the membranes, or recovery cleaning where higher concentrations and longer duration of cleaning chemicals are used. A recovery clean may utilize organic cleans as well as chlorine. In the case of maintenance cleaning, the chlorine is usually consumed in the biomass. For recovery cleans, the spent chemical must be disposed of.

    - Mechanical cleaning –Consists of cleaning membranes by hand using low pressure water and spraying to remove difficult foulants or matted material. This is often done in response to a pretreatment failure in.

- Membrane integrity is typically monitored by reviewing the permeate turbidity of the MBR system. An increase in turbidity indicates a membrane breach or leak in piping. The specific location of the membrane leak can be determined using air pressure hold test methods where low-pressure air is introduced to the permeate side of the membrane and the location of bubbles identifies the leaking area (for hollow fiber membranes only). Membrane integrity testing to determine log removal of microorganisms can be conducted by some vendors although is not currently widely applied.

4.2.4 MBR Package

The MBR systems considered for the District is a complete packaged system to be supplied by a single supplier. In general, the package MBR system will contain the influent fine screens, biological treatment system including pre-anoxic and aeration zones, internal recycle pumps, mixed liquor pumps, membrane chamber with membranes, permeate pumps, process and air scour blowers, chemical feed pumps and the

control system. A copy of the vendor proposal is included in **Appendix B.** The associated tankage will be prefabricated steel tanks manufactured off site and shipped and installed at the project site. **Figure 4-2** shows a typical package MBR system. A copy of the vendor quote is included in **Appendix B.** The MBR system evaluated assumes and average assumes design flow as outlined in **Table 4-1**, i.e., an average daily flow of 0.125 mgd. The MBR system would need to be expanded by adding a second identical package MBR to treat the future flow of 0.25 mgd. Additionally, due to the regional climate, air conditioning units and enclosures will need to be provided for all control equipment to avoid overheating. These are not currently included in the vendor quote.



Figure 4-2: Typical Package MBR Installation (Courtesy Cloacina)

Table 4-3 summarizes the preliminary MBR equipment sizing.

Table 4-3: MBR Equipment Summary

Description	Process	Size	HP	Quantity
Tank Volume	Aeration Process	78,840 gal	-	1
Influent Screen	Screen Platform	350 gpm	0.75	1
Aeration Blower	Aeration Process	350 scfm	20	2
RAS Pump	Aeration Process	465 gpm	20	2
Permeate Pump	MBR Process	200 gpm	7.5	2
Membrane Blower	MBR Process	300 scfm	10	2
WAS Pump	MBR Process	20 gpm	1.0	1

Table 4-4 summarizes the preliminary MBR membrane sizing. The system is based on providing two cassettes and limiting membrane flux to acceptable ranges with one cassette in service.

Table 4-4: MBR Process Summary

Description	One Cassette in Service	Two Cassettes in Service
Membrane Cassettes	1	2
Membrane Area (ft^2)	16,280	32,560
Flux at AAF (gal/ft^2day)	7.7	3.8
Flux at MDF (gal/ft^2day)	10.4	5.2
Flux at PDF (gal/ft^2day)	15.4	7.7
Flow (gpm)	185	93
Air Flow (scfm)	166	331
Production Time (min/day)	1,348	

4.2.5 Projected MBR Treated Water Quality

MBR systems are known for consistently producing high quality treated effluent. The effluent has low suspended solids concentration because the membrane filtration step is a positive barrier. Typical MBR effluent turbidities are less than 0.2 Nephelometric Turbidity Units (NTU). **Table 4-5** summarizes projected MBR effluent water quality from the MBR package proposal. Note, the values in **Table 4-5** are very conservative. MBR treatment will typically achieve BOD_5/TSS < 1 to 2 mg/L, for fully nitrifying systems NH3-N < 1 and TKN < 1.5. In addition to the projected effluent water quality presented in **Table 4-5**, the MBR process has shown to be effective at the uptake of metals such as copper and zinc in the biomass at pilot tests observed at Hayward, California. Although the process is not designed specifically for this uptake, the higher solids retention time and solids uptake potential could be a benefit to Seeley.

Table 4-5: Projected Treated Effluent Water Quality

Constituent	Unit	Value
TSS	mg/L	< 10
BOD_5	mg/L	< 10
TKN	mg/L	< 10
NH3	mg/L	< 5
P	mg/L	< 5

Figure 4-3 below shows a proposed package MBR system layout.

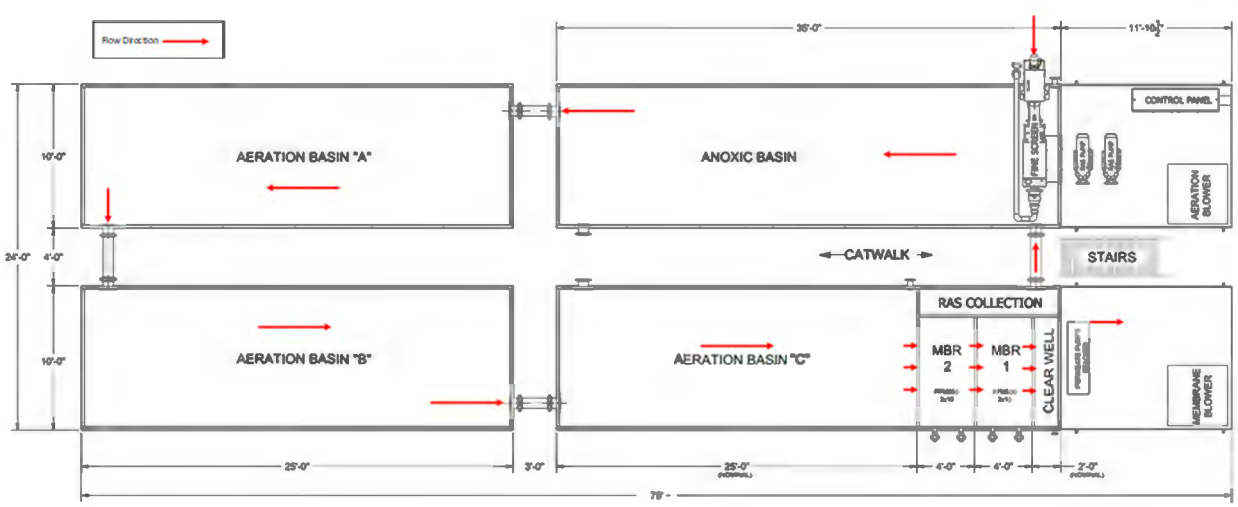


Figure 4-3: Package MBR Footprint (Courtesy Cloacina)

4.3 Biolac®

4.3.1 Biolac® Fundamentals

The Biolac® Wastewater treatment process is a proprietary system which is developed, licensed and marketed by the Parkson Corporation. The name stands for **Biol**ogical **A**eration **C**hains. The system is an extended aeration process that uses floated air distribution and suspended tube diffusers instead of mechanical aeration or fixed, floor mounted diffusers. The Biolac® wastewater treatment systems are considered a viable, costs effective alternative to conventional extended aeration or flow through lagoon processes. The process uses mobile floating aeration chains dispersed across the surface of the lagoons for treatment of wastewaters. **Figure 4-4** shows how the air tubes extend from the chains on the surface to suspend fine bubble diffusers above the floor of the basin. The force of emitting the fine bubble causes the oscillation of the aeration chains along the surface, providing sufficient oxygen across the entire basin to keep the mixed liquor suspended solids in suspension without mechanical equipment.

The Biolac®-R system model is being considered for the Seeley Wastewater Treatment Plant Improvement Project and will be referred to as Biolac® herein . The Biolac® system is intended for domestic and or industrial wastewater with organic loadings between 300 to 30,000 pounds of BOD_5 a day. **Figure 4-5** shows a typical process flow schematic for the Biolac® system, which includes an integral clarifier at the end of the first stage lagoon. The typical Biolac® system uses integral clarifiers with a common wall between the clarifiers and is separated from the aeration lagoon by either a floating wall or concrete wall. The intention of the integral clarifier design is to minimize costs and make the most efficient use of the available footprint. However, reports from local operators of the integral clarifier systems indicate that the clarifier design is challenging to operate. Conventional, independent clarifiers can be used in place of the integral clarifiers increasing the space required and the construction costs.

Figure 4-6 shows a typical integral clarifier section schematic with the main components identified. **Figure 4-7** is a photo of an integral clarifier portion of the Biolac® system prior to startup, the effluent

overflow is shown on the left wall, the flocculating rake mechanism is shown on the far side of the clarifier. Flow enters the clarifiers via under the shared wall at the end of the lagoon, effluent is overflowed from these clarifiers and the sludge is either recycled to the influent of the primary lagoon via gravity or wasted to the solids processing facility.

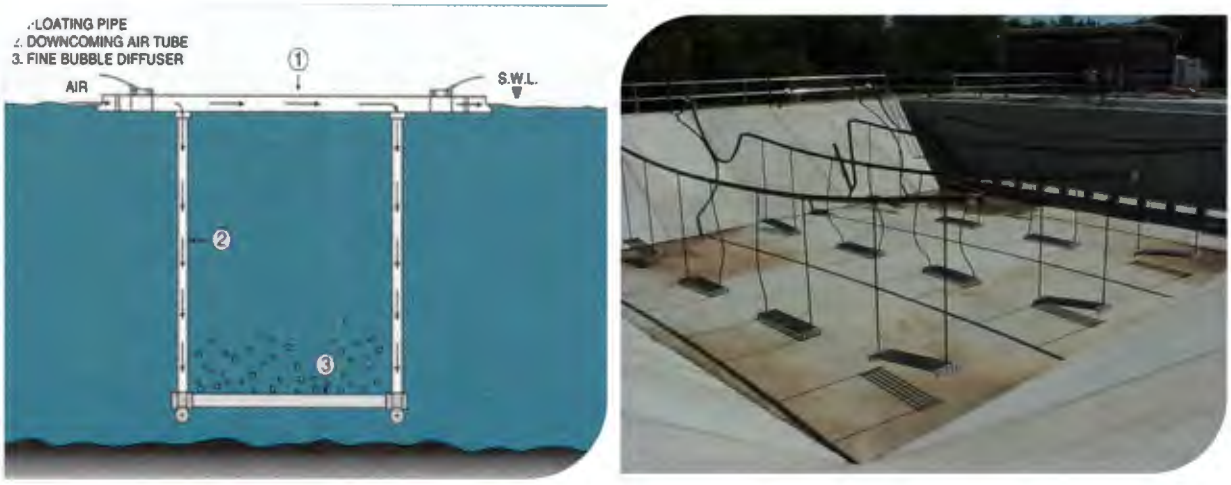


Figure 4-4: Moving Aeration Chain System (Source: Biolac® Preliminary Cost Proposal, 2020)

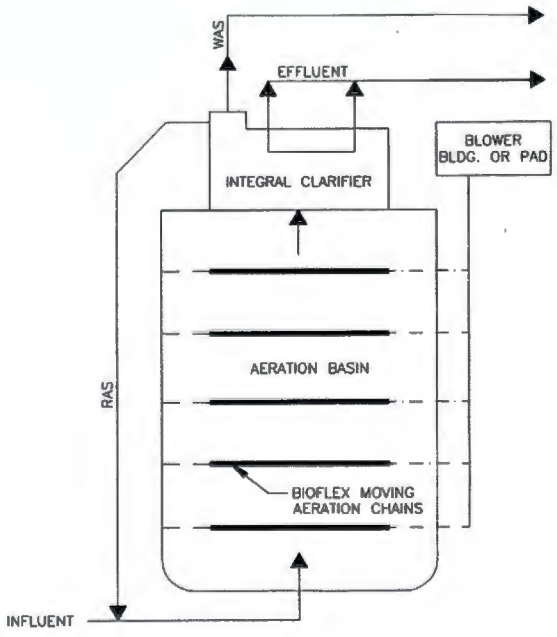


Figure 4-5: Typical Biolac® Process Flow Schematic (Source: Biolac® Preliminary Cost Proposal, 2020)

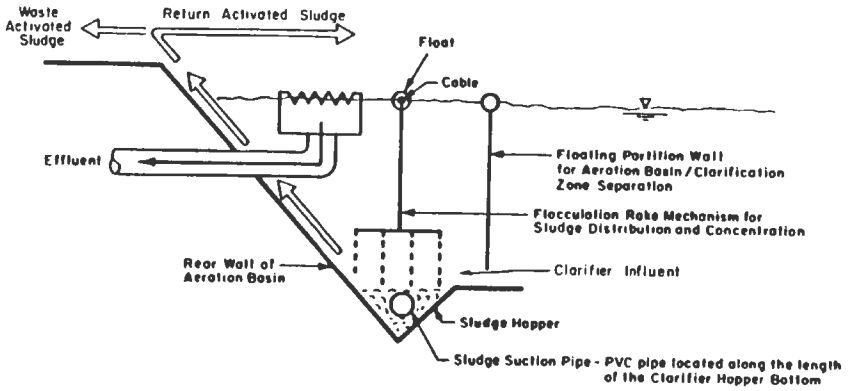


Figure 4-6: Integral Biolac® System Clarifier Schematic (Source: EPA, 1990)



Figure 4-7 Photo of Integral Clarifier Prior to Startup (Courtesy of Parkson Corporation)

4.3.2 Biolac® Design Considerations

Table 4-6 compares typical design criteria for Biolac® systems, to conventional extended aeration systems. Biolac® systems are designed at low food to microorganism ratios (F/M) and MLSS concentrations. The Biolac® aeration sizing is based on the assumption that full nitrification will be accomplished. The typical aeration chain spacing for is eight to 30 feet. The design overflow rates for the integral clarifiers range between 200 and 800 gpd/ft^2.

Table 4-6: Typical Design Parameters – Conventional Extended Aeration System verses Biolac® (Source: EPA, 1990)

Parameter	Unit	Extended Aeration	Biolac®-R
Hydraulic Residence Time	Hours	18 to 36	24 to 48
Solids Retention Time	Days	20 to 30	30 to 70
F/M	lbs. BOD_5/d*lbs. MLVSS	0.05 to 0.15	0.03 to 0.1
Volumetric Loading	lbs. BOD_5/d*1000ft3	10 to 25	6 to 18
MLSS	mg/L	3,000 to 6,000	1,500 to 5,000

Table 4-7 summarizes the design criteria for the proposed Biolac® system for the Seeley WWTP Improvements.

Table 4-7: Proposed Seeley Biolac® Design Criteria (Source: Biolac® Preliminary Cost Proposal, 2020)

Parameter	Unit	Value
Number of Basins	---	1
Approximate Dimensions at Grade	ft	111x75
Approximate Bottom Dimensions	ft	91 x 36
Side Slope	---	1.5X 1
Sidewater Depth	Ft	10
Basin Volume	MG	0.4
Integral Clarifier Size	Ft	30 x 11
No. of Clarifiers	---	2
F/M Ratio	lb BOD_5/d- lb MLVSS	0.05
MLSS	mg/L	3,000
HRT	hours	63
SRT	Days	65-85
Clarifier Design Surface Overflow Rate	gpd/ft2	220
Estimated Standard Oxidation Requirement	lbs./hr.	80
Estimated Airflow	scfm	470

4.3.3 Biolac® Treatment Alternative

The Biolac® alternative includes additional process elements ancillary to the Biolac® secondary process. This section is broken out into the Biolac® package and other supporting elements.

4.3.3.1 Biolac® Package

Table 4-8 provides a summary of the Biolac® Package provided by Parkson. **Appendix C** includes the vendor proposal for the Biolac® Package. The basin and clarifier structures, anchor posts and air conveyance equipment (hoses and any other fittings) between the butterfly valve at the header and the blower will be provided by others and is not included in the vendor quote.

Table 4-8: Biolac Package –Description of Major Elements

Parameter	Unit	Value
# of Diffusers	---	120
# of Biofuser	---	30
# of Bioflex Headers	---	6
Number of Blowers	---	3 (2 duty/standby)
Blower Size	HP	10
Remote Mounted Control System	---	1

Although the vendor proposal recommends using the integral clarifier system, results from discussions with other local operators regarding their experience with this technology have not been positive. As a result, the evaluation and costs presented in subsequent sections includes the Biolac® system with two external 20 ft clarifiers instead of the integral clarifiers included above.

4.3.3.2 Auxiliary Equipment

Table 4-9 summarizes the preliminary criteria for the auxiliary equipment associated with the Biolac® Alternative. Additionally, due to the regional climate, air conditioning units and enclosures will need to be provided for all control equipment to avoid overheating. These criteria will be refined in the next stage of design. The configuration of this equipment is shown in **Section 7**.

Table 4-9: Alternative 2: Supplemental Process Equipment

Design Element	Value
Pre-Treatment Pump Station	
Pump Type	Constant Speed Submersible
Number of Units	2 (lead/lag)

Design Element	Value
Unit Capacity	140 gpm
Fine Screens	
Type	Mechanical
Number of Units	2 (duty/standby)
Bar Openings	3 mm
Unit Capacity	350 gpm
WAS Pumps	
Type	Progressive Cavity
Number of Units	1
Capacity	2 gpm
Power	1 hp
Effluent Pump Station	
Pump Type	Constant Speed Submersible
Number of Units	2 (lead/lag)
Unit Capacity	140 gpm

4.3.4 Projected Biolac® Treated Water Quality

Parkson was provided with the influent parameters discussed in Section 4.1 and the NPDES permit and the effluent requirements for TSS and BOD_5. Parkson's representative stated that there would be no issue meeting these requirements, however they did not specifically provide anticipated effluent quality. BOD_5 removal for Biolac plants has been reported to be over 90% with TSS removal greater than 86%. **Table 4-10** summarizes the effluent quality that was guaranteed by the vendor.

Table 4-10: Biolac® Treated Water Quality Parameters

Constituent	Unit	Value
TSS	mg/L	< 45
BOD_5	mg/L	< 45

With regards to the cyanide and copper requirements, Parkson does not claim removal of either of these components in the biological processes. Some adsorption of these materials to the MLSS is expected,

which would be wasted to biosolids dewatering and drying, but the extent of removal was not quantified. There would also be limited process control parameters to impact removal efficiency.

The current design does not include denitrification. Although the Seeley WWTP does not have any nitrogen or phosphorus effluents limits in the effluent, there is potential that these limits could be enforced in the near future. It is claimed that the Biolac® system can achieve denitrification by implementing the Wave-Oxidation process. Modifying the flow distribution to the Biolac®'s moving aeration chains varies the basin dissolved oxygen content by creating a unique moving wave of multiple oxic and anoxic zones, shown in **Figure 4-8**. This repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping or additional external basins. This optimized process operation can achieve up to 80% denitrification. If nitrogen restraints are implemented in the future, this process capability can be added to the system.

It should be highlighted that Hazen's experience with the Biolac® Wave Oxidation process has shown that it does not provide reliable biological phosphorus removal. Extended air in general, is a poor candidate to meet effluent phosphorus limits due to endogenous decay and re-solubilization of phosphorus..

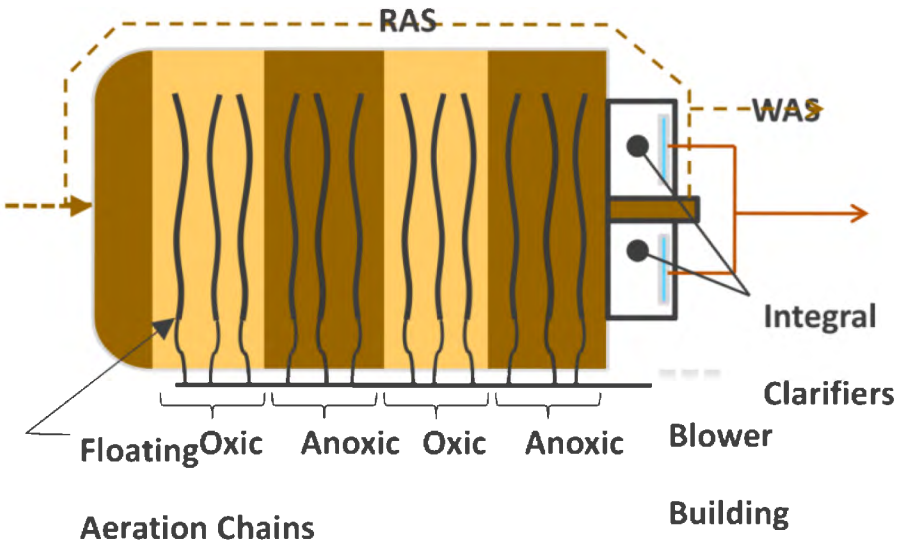


Figure 4-8: Biolac® Wave-Ox Process Modification to provide Denitrification

4.4 Consolidation Evaluation to Nearby Systems

4.4.1 MBR

Membrane Bioreactor technology is a is a proven treatment process in California and over the past 15 or more years it has proven to be very reliable and robust in wastewater treatment applications with countless installations across the nation. The technology is being considered at very large installations with capacities above 70 mgd at the Los Angeles Hyperion Water Reclamation Plant and at 150 mgd at

the County Sanitation District of Los Angeles/Metropolitan Water District Regional Recycled Water Plant Project.

There are some MBR installations near the Imperial Valley as summarized in **Table 4-11**

Table 4-11: MBR Plants near Seeley the WWTP

Location	Plant Capacity	Comments
Yucca Valley, CA	1.65 mgd	Hi-Desert Water District incorporates MBR technology to achieve consistent high-quality effluent
San Diego County	2.64 mgd	Valley Center Municipal Water District, Lower Moosa Canyon Reclamation Facility incorporates MBR to achieve Title 22 effluent standards
	0.28 mgd	Woods Valley Ranch Reclamation Facility incorporates MBR to achieve Title 22 effluent standards
Victor Valley Wastewater Reclamation Authority	1.0 mgd	Apple Valley Subregional Water Recycling facility incorporates MBR to achieve Title 22 effluent standards
Victor Valley Wastewater Reclamation Authority	1.0 mgd	Hesperia Subregional Water Recycling facility incorporates MBR to achieve Title 22 effluent standards

4.4.2 Biolac®

Biolac® systems are marketed upgrade existing lagoon systems to activated sludge and may have lower initial costs than conventional activated sludge or MBR since the system can be installed in existing lagoon with limited construction of new structures. However, Hazen's experience with these systems indicates several operation and maintenance challenges, safety considerations, and potentially increased operations and energy costs compared to conventional systems.

It is recommended that a complete inspection of the Biolac® system be performed once a month. This inspection process should include lifting each diffuser assembly to perform a visual condition assessment in addition to flexing each diffuser to dislodge any foulants on the membrane. The flexing process generally involves shutting the air off in the chain, depressurizing the diffusers by bleeding the air and causing the diffusers to collapse, the air is then turned back on, and the diffuser is expanded to its regular active size. Diffuser replacement is recommended every seven years. Experience with similar systems has suggested that the flexing maintenance may need to performed more frequently. Since there is only one proposed basin under the Biolac alternative, it cannot be dewatered to access and maintain this equipment. Other plants have reported having to use a small boat to float in the lagoon to lift the diffusers for maintenance, which has significant health and safety risks.

The tubular fine bubble diffusers that are used in the Biolac® system are less efficient than membrane disc or panel diffusers typically used in conventional systems., at the time of installation. The shallow proposed Biolac basin depth further reduces aeration efficiency. Difficulty accessing the diffusers leads to deferred diffuser maintenance. Off-gas diffuser testing performed by Hazen at a Biolac plant indicated extremely fouled and torn diffusers resulting in substantial solids accumulation between the diffuser membrane and tube. The testing indicated that the installed diffusers were substantially less efficient than would be expected for an aged membrane diffuser.

The large volume of the Biolac basin relative to conventional activated sludge or MBR also presents challenges. The Biolac aeration chains provide mixing as well as oxygen distribution, and the mixing requirements to keep solids in suspension can exceed the process oxygen demand, especially during low loading periods, further diminishing the efficiency of this system. . Additionally, the long SRT associated with the large volume results in low F:M rations, which present challenges with MLSS settleability. The inability to tailor the online volume to the load coming into the plant reduces the operational flexibility of the system to adapt to changing conditions and requirements.

Several nearby WWTP's were contacted to discuss their experiences with the two technologies evaluated. **Table 4-12** summarizes the Biolac® installations in the Imperial Valley

Table 4-12: Biolac® Plants near the Seeley WWTP

Location	Plant Capacity	Comments
Imperial Wastewater Treatment Plant	1 mgd	Biolac® plant with integral (common wall) clarifiers
Holtville Wastewater Treatment Plant	0.75 mgd	Biolac® system with external (circular) clarifiers. This alternative is more costly to build the clarifiers plus it's adds in a RAS pump station that doesn't existing with the integral clarifiers
Brawley Wastewater Treatment Plant	5.9 mgd	Biolac® system with three basins.
Calexico Wastewater Treatment Plant	2.9 mgd	Biolac® system identified as the preferred WWTP upgrade due to its low estimated capital costs, in a 2018 study which compared an activated sludge system, oxidation ditch system and Biolac® system. The Biolac® system will be installed in the near future.

4.5 Evaluation and Recommendations

Table 4-13 summarizes the estimated annual operation & maintenance costs developed for the two alternatives.

Table 4-13: O&M Annual Cost Comparison Summary

Description	MBR	Biolac®
Equipment Consumables & Spare Parts	$3,100	$1,500

Description	MBR	Biolac®
Equipment Replacement	$46,000	$25,000
Power	$54,000	$24,000
Labor	$35,000	$24,000
Chemicals	$8,900	NA
Total Annual O&M Estimate	**$147,000**	**$75,000**

Table 4-14 summarizes the assumptions used to develop the O&M estimate.

Table 4-14: O&M Cost Assumption Summary

Parameter	Unit	Value	Reference
Power	$/KWH	0.10	Industrial Rate per electricitylocal.com
Labor	$/hour	25.00	Average rate provided by plant operator
Sodium Hypochlorite[1]	$/gal	2.87	Provided by vendor
Citric Acid[1]	$/gal	10.95	Provided by vendor

1. Used for MBR Cleaning

Table 4-15 summarizes the estimated capital costs developed for the two alternatives. The cost estimate is based on the Association for the Advancement of Cost Engineering (AACE) class 4 cost estimate. Refer to **Section 10** and/or **Appendix D** for more detail of the cost estimate.

Table 4-15: Capital Cost Comparison Summary

Description	MBR	Biolac®
Treatment Alternative	$4,800,000	$5,500,000
Sludge Drying Beds[1]	$4,900,000	$2,100,000
Electrical and I&C Infrastructure	$1,400,000	$1,500,000
Sub Total	**$11,100,000**	**$9,100,000**
Support Upgrades[2]	$2,600,000	$2,600,000
Total	**$13,700,000**	**$11,700,000**

1. Mechanical dewatering options discussed in section 5.1.4
2. Support upgrades outlined is section 10.1

After developing the two alternatives discussed above, Hazen used its Converge tool to further compare the alternatives in terms of weighted criteria and assigned scores. Hazen Converge is an in-house developed spread sheet tool which normalizes weighted alternatives to create comparable scores. The tool also generates graphical representations of the evaluation results. Hazen decided upon the Criteria and scoring in order to accurately assess alternatives. **Table 4-16** describes the criteria that were used.

Table 4-16: Evaluation criteria and definitions

Criterion	Description
Effluent Water Quality	Ability of the treatment process to produce a consistent high quality effluent water with low turbidity
Cyanide/Copper Reduction	Ability of the treatment process to uptake copper and cyanide, i.e., overall reduction
Footprint	Estimated site square footage needed for process
O&M Effort / Cost	Intensity of, and skill level required for, operations and maintenance activities associated with the treatment process and the corresponding costs of operating and maintaining the process.
Ease of Construction	Ability to deliver equipment to the site, level of skilled labor required versus availability for the area, length of construction period, impact of weather on construction.
Future Expansions	Ability for process to easily expand for future flows
Regulatory Flexibility	Ability for process to easily be expanded or retrofitted to meet more stringent future regulatory standards such as nutrient removal
Capital Cost	Estimated cost of construction of the process

Each criterion may have different importance for the District. For example, “Future Expansions” may be more important than “Regulatory Flexibility”. Therefore, a weighting factor for each criterion has been assigned. It is recommended the District review the weighting factors presented to properly capture the relative importance of each criterion.

Scoring by Hazen of the treatment system alternatives and the resulting weighted scores are presented in **Table 4-17**. A score of five denotes that the alternative is very favorable with regards to the specified criteria, while a score of one means the alternative offers is disadvantageous for that criteria.

Table 4-17: Total Scoring of each Alternative

Criteria	Weight	Alternative 1: MBR		Alternative 2: Biolac®	
		Direct Score	Weighted Score*	Direct Score	Weighted Score*
Effluent Water Quality	10	5	50	3	30
Cyanide/Copper Reduction	10	4	40	2	20
Footprint	10	2	20	4	40
O&M Effort / Cost	15	2	30	3	45
Ease of Construction	10	4	40	2	20
Future Expansions	10	5	50	3	30
Regulatory Flexibility	15	5	75	2	30
Capital Cost	20	1	20	4	80
Total Score	**100**	**28**	**325**	**23**	**295**

Table 4-18 summarizes advantages and disadvantage of each treatment alternative.

Table 4-18 Alternative Comparison

Alternative	Advantage	Disadvantage
Alternative 1: MBR	• Results in a high treated water quality. • Ability to meet future discharge requirements (i.e., nutrient removal) • The MBR filtration process produces low solids in treated effluent • Covered basins for better odor control. • Better suited for future regulatory compliance • Requires a much smaller footprint for the future expansion	• More complex, will require more operator input. • More expensive to operate. • Higher capital cost
Alternative 2: Biolac®	• Low operator input • Low operating costs compared to MBR. • Low solids production	• Difficult to maintain. • Current design offers no redundancy. • Future expansion requires large additional footprint.

5. Design Criteria

5.1 Treatment System

The subsequent subsections describe the treatment process at the plant. **Sections 5.1.1** and **5.1.2** describe the existing conditions for septage receiving process and treatment process, respectively. **Sections 5.1.3** and **5.1.4** describe the proposed dewatering systems. The intention for the final report is for this section to include the proposed design criteria for the chosen alternative.

5.1.1 Septage Receiving

The existing septage receiving area includes a screen and grit vault which includes a manual 3-feet x 3-feet bar with 1-inch openings. The screen and grit vault has dimensions of 5-feet long x 6-feet wide x 3.5-feet deep. The screen and grit vault are surrounded by a 24-feet long x 13-feet wide concrete slab and curb. This area is for the trash dumpster that the haulers use for the grit and screenings. The haulers are responsible for manually cleaning the screen and removing the grit into the dumpster. This curbed area is to protect against overflows caused by the haulers while unloading. Trucks are equipped with their own 3-inch or 4-inch diameter hoses to dump into the dump station. Septage that is screened and degritted is routed to the influent sewer where it is blended with the domestic wastewater prior to entering the headworks pumping station. The pump station is 22-feet deep with a submersible solid handling pump that discharges to the main lagoon. **Figure 5-1** shows a birds eye view of this area.



Figure 5-1 Existing Septage Receiving System Layout

5.1.2 Treatment Plant

Flow enters the plant via gravity line and enters into the influent pump station where it is comingled with any septage. From the influent pump station, the flow is pumped to the north end of the oxidation pond 2. After about eight to 20 days, the flow exits the south end of the pond and flows to the Clemson Ponds via gravity. Flow typically enters the Clemson Pond system through the inlet at pond 1 and circulates through the ponds sequentially by number, however Clemson ponds are connected via a system of pipes and valves and any pond can be bypassed if needed. A small recycle pump station can recirculate flow from the Clemson Ponds back to the inlet of the lagoon. However, typical operation is for the Clemson pond effluent to be pumped back to the pressure filter and UV building via the Effluent pump station. From the UV filer the effluent is conveyed to the north end of the plant for discharge into the new river. **Table 5-2** includes the existing design criteria.

Table 5-2: Existing Treatment Plant Design Criteria

Design Element	Value
Influent Pump Station	
Pump Type	Constant Speed Submersible
Number of Units	2
Unit Capacity	140 gpm
Aeration Lagoon	
Volume	3.75 MG
Detention Time	8-20 days
Freeboard	2 ft
Aerators	6 Aspirating Floating Aerator Units
Clemson Ponds	
Pond 1 & 2	Complete Mix – 5 HP 69 ft x 69 ft
Pond 3 to 5	Sedimentation 1 HP 74 ft x 74 ft
Effluent Pump Station	
Pump Type	Constant Speed Submersible
Number of Units	2 (duty/standby)
Unit Capacity	140 gpm
Power	1.5 hp
Pressure Filter	(old/new)
Number of Filters	2 / 1

Design Element	Value
Operating Pressure	100 psi / 100 psi
Design Treatment Flow (per unit)	70 gpm / 220 gpm
Backwash Flow	272 gpm / 666 gpm
UV disinfection System	
Capacity	170 gpm (min)
Minimum UV transmittance	65%
Maximum TSS	12 mg/L
Minimum UV dosage	30 mJ/cm2
Recycle Pump Station	
Power	0.5 hp

5.1.3 Dewatering System

Sludge drying beds were selected as the dewatering method for this alternatives analysis. Drying beds were chosen to take advantage of both the high wind and temperatures at the plant location, in addition to the low operating costs. In this process the sludge is distributed across the drying bed, the dewatering of the sludge occurs via drainage and evaporation. Ultimate bed sizing is a function of evaporation, application depth and applied solids concentration.

Two options were evaluated for the reduction of water after the MBR and Biolac® treatment options. Option 1 assumes the waste activated sludge (WAS) from each treatment process is sent directly to sludge drying beds for dewatering, and Option 2 assumes the WAS is first mechanically dewatered before sending the solids to sludge drying beds. See **Table 5-3** for the assumptions used to size the sludge drying beds. In general, conservative assumptions were used due to drying beds typically being undersized in practice compared to design in areas of similar evaporation rates.

Table 5-3: Drying Bed Calculations – Assumptions

Design Element	Assumed Value	Source
Evaporation Rate, in/yr.	42.5	CA Dept. of Water Resources
Precipitation Rate, in/yr.	4.3	US Climate Data for El Centro
Sludge Bed Depth, ft	1	Typ. 8-12 in. 10 State Standards, ADEQ Manual
Solids After Mechanical Dewatering (Option 2 only), %	12%	Typ. 12-20% Metcalf &Eddy, Wastewater Engineering Treatment and Reuse
Water Removed by Sludge Bed Drain, %	10%	Designer Assumption

The evaporation and precipitation rates were selected for winter months (October – March) to size the beds conservatively for the months with lowest of evaporation rates, approximately 60% lower than in the summer months. It should be noted the sludge drying beds were sized based on summer WAS production for only MBR treatment with Option 1. Due to elevated summertime water temperatures resulting in more efficient nitrification, during the summer months it was assumed that the MBR treatment produces double the WAS volumes than during the winter months, requiring more drying bed area if the sludge is not mechanically dewatered. The percent solids after mechanical dewatering value was based on belt press or screw press-type dewatering options (**Table 5-3**).

See **Table 5-4** for the area required for each of the four options.

Table 5-4: Acres Required for Sludge Beds

	Assumed WAS characteristics[1]	Condition	Required Sludge Drying Bed Acreage	
			Average Day	Build-out Capacity
MBR	**Dry Solids Production:** Average Day – 378 lbs./day Build-Out Flows – 756 lbs./day **Percent Solids:** 1%	Option 1 – No additional dewatering	1.41	2.82
		Option 2 – Receiving sludge has been mechanically dewatered	0.10	0.20
Biolac®	**Dry Solids Production:** Average Day – 152 lbs./day Build-Out Flows – 317 lbs./day **Percent Solids:** 0.75%	Option 1 - No additional dewatering	0.62	1.29
		Option 2 - Receiving sludge has been mechanically dewatered	0.04	0.08

Notes: WAS characteristics for each alternative were provided by the vendor

The average day drying bed acreage requirements with no additional dewatering were used to generate the cost estimate and site layout.

5.1.4 Optional Mechanical Dewatering

The estimated cost and size of the sludge drying beds significantly exceeded the original preliminary estimates. Therefore, for decision purposes the project will likely utilize mechanical dewatering. This

will reduce the capitol cost significantly. The installed cost for a mechanical dewatering system will be approximately $800,000 for either treatment alternative. This would require sludge drying bed options 2 as outlined in **Table 5-4,** with associated construction costs of about $400,000 to $200,000 respectively.

5.2 Civil Requirements

This project will be constructed at the existing Seeley WWTP, which is located north of the W. Evan Hewes Highway and west of New River Blvd. The New River is located to the west of the WWTP, and New River is shown as part of a Zone A Flood Zone on the Federal Emergency Management Agency (FEMA) map. The WWTP is located with FEMA Zone A within an area of minimal flood hazard. Because all new construction will be located within the current WWTP boundaries, it is not anticipated that any new land acquisition will be required.

The WWTP site is a relatively flat site. Site access will continue to be from New River Blvd. As much as possible, the existing grading, paving, and drainage will be designed to match existing conditions. During the final PER a topographic survey and geotechnical investigation will be conducted for the site.

Proposed utilities will be located within the WWTP boundaries and will generally be between processes. New utilities will be coordinated with existing utilities during design. There are no anticipated modifications to existing site security, such as fencing.

5.3 Odor Control

The existing WWTP consists of processes, such as ponds, that are open to the atmosphere and do not currently have odor control. It is not anticipated that any new odor control facilities will be installed as part of this project, but new processes will be designed with the ability to add odor control systems in the future if needed.

5.4 Structural and Architectural

Materials and construction will be designed in accordance with the governing code and supplementary design codes. The governing code used for the proposed design is the 2019 California Building Code, based on the 2018 International Building Code as adopted and amended by the State of California. Design loads and design criteria will be as noted on the general structural notes drawing and applied in accordance with the governing code. Dead loads, live loads, wind and seismic will be determined in accordance with the California Building Code and ASCE 7. Process area operating floors are designed for either 300 pounds per square foot (psf) on the entire floor area, with no additional load from equipment included, or 150 psf on the areas not directly under equipment, plus actual equipment loads.

5.5 Instrumentation and Controls

The existing WWTP consists of a variety of local control panels and one influent and one effluent flow meter. The control panels are field mounted, utilize relay logic and require manual input from operators

for equipment to operate as intended. The influent and effluent flow meters are installed in flow vaults and operators record flow values manually.

Depending on the technology selected, the equipment vendor will provide a control panel to be used as the Master Control Panel (MCP) for the WWTP. The MCP will be outfitted with redundant programable logic controllers (PLC), a robust cooling system and an operator interface terminal (OIT) with sun protection. The MCP will be networked to a new computer in the Operations Building where the field OIT screens will be mirrored at the computer. This computer will act as a server and store the HMI code and data historian. Hazen will coordinate the integration of existing signals to the master control panel and the development of OIT screens with the chosen vendor.

In addition to the new vendor package controls, the MCP a new control panel will be required to control and monitor the existing influent lift station, a new lift station to feed the secondary process, the Clemson pond effluent lift station and the existing pressure filter and UV system. The signals for the existing equipment will be routed to the new MCP in new conduit from the respective areas.

Communication will likely be ethernet network wiring but further evaluation is required to confirm communication required between the existing system, vendor package system, and lift stations. A network diagram and functional control description outlining the modified controls associated with the upgraded WWTP will be developed further during design.

6. Hydraulic Evaluation

A preliminary hydraulic evaluation was performed for each alternative in disassociated areas throughout the treatment process. The purpose of these calculations are to validate whether certain existing equipment would be sized appropriately to accommodate the design changes proposed changes associated with the treatment alternatives. Additionally, calculations were performed to predict where the treatment flows could be conveyed by gravity and where an additional pump would be needed. The results of this analysis are also used to appropriately size the proposed piping. The selected piping sizes were sized large enough to convey the total required flow and minimize head loss, while not oversizing so the design is an economic as possible.

The results of these preliminary analysis suggest that the influent and effluent pump stations can be used for both alternatives. A new lift stations will be required upstream of the proposed treatment alternatives to generate enough head to convey flow through the fine screens. Additionally, the effluent from the treatment process for both alternatives will need to be pumped to the existing UV treatment building. As a result, a new lift station is proposed for the Biolac® alternative, the MBR vendor quite includes a permeate pump to convey the effluent.

It should be noted that not all information that is needed to confirm the hydraulic design criteria is available at this time, therefore the conclusions made during this analysis are just preliminary. Site survey information which include topography, survey of inverts existing manholes will be required to confirm these results. Additionally, a site investigation will be required to verify the make, model and condition of certain pumps and equipment.

A full hydraulic profile will be generated for the selected alternative for the final version of this report.

7. Preliminary Layout Schematics

Preliminary Process flow diagrams and site schematics have been generated for each alternative, see **Appendix E** for preliminary drawings.

8. Electrical Preliminary Design

The Seeley Water District Wastewater Treatment Plant has two separate electrical utility services on site. The serving electrical utility for this facility is the Imperial Irrigation District (IID).

Based on available record drawings, one utility which is located near the existing small ponds supplies the south end of the site with a 480/277VAC service routed via an automatic transfer switch for connection to an existing standby generator. From the load terminals of the transfer switch the connection is made to a distribution section. The Distribution Board (MDB-1) includes the transfer switch, distribution section, and utility meter. This Distribution Board (MBD-1) is a 480/277VAC, 225A, 3-phase, 4-wire, 42kAIC system. The current size of the existing standby generator is 125kW.

The south side of the existing WWTP includes the following facilities fed by the 480V service and are backed up by a 125 kW generator:

1. Influent lift station
2. Clemson pond aerators (5)
3. Existing recycle flow lift station
4. Clemson pond effluent lift station

Based on available record drawings, the second utility located near the main office which supplies the north end of site with a 240/120VAC service to a Panelboard (SES) that includes a utility meter. The Panelboard (SES) is a 240/120VAC, 225A, 3-phase, 4-wire, 10kAIC system.

The 240V service feeds the UV system, the existing pressure filters and pressure filter backwash pump station, and the existing operations building. The 240 V service is not supplied with backup power from the existing generator. The Distribution Board (MDB-1) will serve as the main distribution. For the Biolac® option, as described in **Section 4.4.2** – Biolac, the facility may need to have an upgraded utility service of 400A installed to serve the new loads but further evaluation will be required before making final determination. For the MBR option, as described in **Section 4.4.1** – MBR, the facility may need to have an upgraded electrical utility service of 400A installed to serve the existing loads in addition to the new loads. The standby generator may need to be upgraded because it may not be adequately sized to provide standby power for either the Biolac® or MBR option.

Table 8.1 below identifies existing load information based on record drawings at MDB-1 and new proposed equipment load for the Biolac® and MBR option.

Table 8-1: Existing and Proposed Equipment Load List

Description	HP	KW	KVA	FLA
MDB-1 (EXISTING)	24.0	2.4	31.0	81.0
BIOLAC® SYSTEM (NEW)	36.5	0.0	0.0	56.1
MBR SYSTEM (NEW)	73.3	70.7	0.0	200.0

9. Operations and Laboratory Building Structural Design Criteria

The basis of the structural design used for the prefabricated metal building, the prefabricated metal canopy structures, and the foundations for both building and non-building structures that comprise the Seeley Wastewater Treatment Plant Improvements are presented in **Section 5.4** and in this section.

The Operations/Aeration Blowers Building will be a pre-engineered metal building frame consistent with conventional pre-engineered metal building construction using non-prismatic sections to span the entire extents of the structure. The column bases will be pinned with all forces transferred to the conventionally reinforced concrete foundation mat slab. The mat slab will have a 24-inch thick lug footing around the perimeter of the slab to resist the building column reaction loads.

The canopies over the MBR Trains/Chemical Feed System and the Fine Screens will be either a pre-engineered metal building frame consistent with conventional pre-engineered metal building construction using non-prismatic sections to span the entire extents of the structure or a structure with interior columns. The structure with the interior columns will use standard pre-engineered I-beam construction with a standard mat foundation. The non-prismatic framing system would allow the deletion of the interior columns around the equipment. The column bases will be pinned with all forces transferred to the conventionally reinforced concrete foundation mat slab. The mat slab will have a 24-inch thick lug footing around the perimeter of the slab to resist the canopy column reaction loads. The Canopy will be furnished with a corrugated metal fascia skirt provided by the metal building manufacturer.

Several exterior reinforced concrete equipment support pads will be constructed. These pads will support various types of equipment and will be supported directly on grade.

A geotechnical investigation will be performed during the detailed design phase to determine design parameters and foundation requirements for structural design. Foundation requirements will likely consist of mat slab foundations for the building and canopy structures supported at grade. This assumption will need to be verified by a geotechnical investigation conducted by a qualified geotechnical consultant. The geotechnical investigation will also address issues including impact of groundwater on design and

construction, excavation support and backfill recommendations, potential soil corrosivity, potential for soil liquefaction, and anticipated soil static and dynamic settlement.

9.1 Architectural

The building and canopies will be constructed in accordance with the current California Building Code. The Operations / Aeration Blower Building will be designed to accommodate accessibility requirements of the California Building Code and the Building Energy Efficiency Standards. The building will be considered a Business Occupancy and the canopy considered a Utility occupancy.

Both structures will be designed with pre-engineered metal building structural systems classified as Type IIB construction by the Building Code. The structures will be utilizing typical pre-engineered metal building roof and wall panels with Kynar finish. The canopy wall system will begin about 11-feet above grade. The canopy walls and roof will remain uninsulated. The building wall and roof systems will be insulated with R-30 insulation in the roof system and R-15 insulation in the wall system. Exterior doors shall be insulated hollow metal doors and windows shall be aluminum framed with double pane Low-E glass. Interior finishes of the building will include an exposed ceiling system with hung lighting, painted gypsum wall board and troweled concrete with clear sealant floor system with rubber base. The toilet room will be a unisex toilet and designed to accessibility standards. A single toilet is allowed by the California Plumbing code Paragraph 4.22.2 exception 3 as the building will be classified as a B occupancy and has an occupant load of less than 50.

10. Class 4 Opinion of Probable Construction Costs and Preliminary Construction Schedule

10.1 Opinion of Probable Cost Summary

The project costs are broken out into three different elements, the costs that are unique to the MBR alternative, the costs that are unique to the Biolac® alternative and support upgrade costs that are included in both alternatives. The costs that are included in both alternatives include, the pre-treatment junction box/lift station, the septage receiving station, the Operations building and the yard piping. A summary of the costs for each alternative has been previously included in **Section 4.5**, a summary of all costs is included below in **Table 10-1**. To calculate the complete costs for each alternative, add the cost for the alternative to the supporting costs.

The estimate serves for budget authorization and alternative analysis and is considered to be an AACE Class 4 level. Class 4 has a typical accuracy range of -30% on the low side and +50% on the high side. A 35% design contingency has been added to the estimate based on current status of the design documents, the nature of the project and the estimate classification.

Table 10-1: Probable Costs

	Support Upgrades Probable Project Cost ($M)	Biolac® Probable Project Cost ($M)	MBR Probable Project Cost ($M)
Probable Project Cost	**$2.60**	**$9.10**	**$11.10**
High Probable Cost per AACE Class 4 Estimate Classification (-30%)	$3.90	$13.65	$16.65
Low Probable Cost per AACE Class 4 Estimate Classification (+50%)	$1.82	$6.37	$7.77

The probable project costs presented are conservative. The next phase of this report will investigate multiple value engineering approaches to reduce the cost presenting above. These approaches include, but are not limited to, using investigating a mechanical dewaterer to reduce the construction costs of the drying beds and reusing existing abandoned infrastructure to replace proposed junction boxes and conveyance piping.

There are several facility upgrades required for both the MBR and Biolac® treatment options. These are summarized in **Table 10-2**.

Table 10-2: Treatment Support Summary

Description
Yard Piping
Lagoon Lift Station
Office Building
Site Improvements

Table 10-3 includes a summary of cost adders. These factors are generally in-line with recent estimated projects in this location and of this size and conform to the AACE Class 4 of each scope.

Table 10-3: Below the Line Cost Adders Summary

Below the Line Adders	
Item	**%**
General Conditions (Div01)	10
% Work performed by Subcontractor	20
Subcontractor Overhead and Profit	25
Contractor Mark-up on Subcontractor	5
Contractor Overhead	10
Contractor Profit	10
Escalation to mid-point of construction	5
Insurance and Bonding	3
Project Costs (Eng/CM/Legal/Admin)	30
Contingency	35
MBR Contingency[1]	20

1. Applied to MBR option only.

The full draft cost estimate and associated memo is included in Appendix D.

10.2 Preliminary Construction Schedule

Table 10-4 summarizes the anticipated project milestones for the design and construction phases. A preliminary construction schedule will be developed for the final report.

Table 10-4: Anticipated Project Milestones

Milestone	Anticipated Date
Construction Load Application	March 31, 2020
60% Design Submittal	September 30, 2021
90% Design Submittal	December 31, 2021
100% Design Submittal	January 31, 2022
Project Bid	February 2022
Project Construction Complete	February 2023

11. Operational Procedure Plan

The Operational Procedure Plan is a general description of the operations during construction and then after construction.

During construction, the facility will maintain operation of the facility to meet existing permit requirements. The contractor will be required to maintain the ability for the plant to operate throughout construction and will coordinate all plans to temporary flows and shutdowns during the project. The existing Operations Plan will therefore stay in place until the new plant starts operating.

After construction, the following operations procedures are anticipated. Further development of the Operations Procedure Plans will be refined once final selection of the secondary treatment technology is determined.

Influent Lift Station will continue as currently operated. In the event oxidation pond 2 is removed from service for cleaning and maintenance, the lift station will send flow via an existing bypass to the secondary process feed pump station at the effluent box of Pond 2.

Oxidation Pond 2 will operate with aerators as it is currently operated to achieve BOD_5 and TSS removal. The pond will be modified to allow the top 1 ft of depth to be equalization for peak hour events. The pond overflow will remain routed to 3 of the existing Clemson ponds to use as additional equalization when the feed to the MBR is at maximum flow of 2Q. The remaining flow will be equalized and then fed through the treatment process when peak flows recede.

Secondary Process Lift Station will be provided to lift flow to fine screens prior to flowing through the secondary treatment process. The lift station will be controlled to maintain flow to the MBR or Biolac systems.

The secondary process will be operated to achieve water quality as indicated in section 3.3 above.

Pressure filter lift station for Biolac Effluent will be operated to send flow through the pressure filters and the UV system to the river. Control of the pumps will be based on level in the Biolac system.

UV system control will remain similar to existing operations to achieve disinfection for both the MBR and Biolac effluent.

12. Permitting Requirements

12.1 Permitting Overview

The project site is currently a WWTP and this use will not be changing. Therefore, permits required for this project are anticipated to be typical permits required for modifying a WWTP and for general construction.

12.2 Imperial County Permits and Approvals

Seeley is an unincorporated town located within Imperial County and so is governed by Imperial County Regulations. The Imperial County Division of Building and Safety (Building), which is part of the Imperial County Planning and Development Services Department (Planning), will be responsible for reviewing building permit applications and issuing building permits. The 2019 California Building Codes and 2018 International Codes are used for Imperial County projects. According to the Imperial County website, the following permits are anticipated to be required for this project:

- Building
- Electrical
- Mechanical
- Plumbing
- Grading
- Demolition

These permits will require the following approvals prior to issuance:

- Zoning (by Imperial County Planning)
- Right-Of-Way (by Imperial County Public Works)
- Encroachment (by Imperial County Public Works)
- Workers Compensation Insurance (by Imperial County Building Department)
- Fire Mitigation Fee Review (by Imperial County Building Department)
- School Review (by Imperial County School Department)

The Building Permit will typically be applied for and issued to the construction contractor. However, during 60% design Hazen will contact the Imperial County Building Department to discuss the permit

requirements and determine if drawings and specifications can be submitted for review prior to bidding the project.

12.3 National Pollutant Discharge Elimination System (NPDES) 2017 Construction General Permit

The National Pollutant Discharge Elimination System (NPDES) Construction General Permit Program is managed by the SWRCB. The SWRCB requires that contractors who disturb more than one acre of soil prepare a Strom Water Pollution Prevention Plan (SWPPP), prepared by a California Qualified SWPPP Developer (QSD) in order to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-009-DWQ. It is likely that this project will disturb more than one acre and so it is anticipated that a SWPPP will be required for this project.

12.4 Air Quality Program

This project is within the area governed by the Imperial County Air Pollution Control District (Imperial County APCD), which is part of the California Air Resources Board. Imperial County APCD would be responsible for issuing any required air permits. However, it is assumed that there will be no emissions generated by day-to-day operation and there are no anticipated modifications to any generator operation, so it is anticipated that a new air permit will not be required for this project.

12.5 Regional Water Quality Control Board

The WWTP operates under Waste Discharge Requirements (WDR) as contained in Order R7-2-17-0016 NPDES CA0105023, issued by the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB). This permit was issued on November 9, 2017 and is set to expire on September 30, 2022. The permit limits effluent flow to 0.25 MGD. Other permit requirements are discussed in Section 3. It is anticipated that the plant improvements will trigger the need to revise this permit. This will be discussed with the CRBRWQCB during 60% design.

12.6 State Water Resources Control Board

As discussed in **Section 12.3,** the SWRCB is responsible for stormwater permitting during construction. In addition, the SWRCB and the District executed Fiscal Agreement SWRCB D1901022. This agreement requires specific deliverables be submitted for SWRCB review, including this PER. In addition, there are other agreement requirements such as meetings and conducting an alternatives analysis.

12.7 Applicable Permits

Table 12-1 summarizes the anticipated required permits for this project.

Table 12-1: Permit Summary

Permitting Agency	Required Permit or Approval	Application Requirements	Responsible Party
Imperial County Planning	Building Permit	Site plans, facades	Hazen / Contractor
SWRCB	General Permit Coverage (stormwater)	SWPPP	Hazen / Contractor
Imperial County APCD	None Anticipated	n/a	n/a
RWQCB	Updated Discharge Permit	Revised WDR	Hazen
SWRCB	Fiscal Agreement	PER, drawings, meetings	Hazen

13. 30% (Thirty Percent) Drawings

Table 13-1 is a preliminary list of drawings for this project, with the shaded ones planned for the 30% Drawings Submittal. This submittal will be included with the final PER submittal. This drawing list is based on the MBR option and will be updated once the treatment system is selected.

Table 13-1: Preliminary Drawing List

Sheet No.	Dwg. No	Title
1	G-1	Cover Sheet
2	G-2	Drawing Index
3	G-3	General Notes and Abbreviations
4	G-4	Legends and Symbol
5	G-5	Hydraulic Profile
6	G-6	Process Flow Diagram
7	D-1	Demolition Site Plan
8	D-2	Demolition Details
9	C-1	Key Site Plan, Contractor Access, and Staging Plan
10	C-2	Site Grading and Paving Plan
11	C-3	Site Yard Piping and Drainage Plan
12	C-4	Civil General Details I
13	C-5	Civil General Details II
14	M-1	Mechanical Notes and Legend
15	M-2	Mechanical Plan
16	M-3	Screenings Plan and Section

Sheet No.	Dwg. No	Title
17	M-4	Chemical Area Plan and Section
18	M-5	MBR Plan
19	M-6	MBR Section
20	M-7	Drying Bed Plan and Details
21	M-8	Mechanical Sections II
22	M-9	Mechanical Details I
23	M-10	Mechanical Details II
24	S-1	Structural Notes and Inspection Notes
25	S-2	Structural Site Plan
26	S-2	Screening Structural Plan and Details
27	S-3	Chemical Area Structural Plan
28	S-2	MBR Foundation Plan
29	S-3	Operations Building Foundation Plan
30	S-4	Operations Building Structural Plan
31	S-5	Operations Building Sections
32	S-4	Operation Building Details
33	S-5	Drying Bed Structural Details
34	S-6	Structural Details II
35	S-7	Structural Details II
36	A-01	Architectural Notes
37	A-02	Architectural Code
38	A-03	Operations Building Plan
39	A-04	Operations Building Elevations
40	A-07	Screening Enclosure
41	A-08	Equipment Enclosure Plans and Elevations
42	A-09	Equipment Enclosure Sections and Details
43	E-01	Symbols and Legends
44	E-02	Abbreviations
45	E-03	Site Plan
46	E-04	Area Classification Plan
47	E-05	MBR Area Plan
48	E-06	Detail Plans - Influent/LS Plan, Recycle Water PS
49	E-07	Operations Building Power Plan and Lighting Plan
50	E-08	Power Single Lines
51	E-09	Riser Diagrams
52	E-10	Conduit and Cable Schedule
53	E-11	Electrical Details 1
54	I-1	Symbols and Legends
55	I-2	Network Diagram
56	I-3	Influent Lift Station P&ID
57	I-4	Treatment System P&ID 1 (through Aeration tank w/RAS WAS)

Sheet No.	Dwg. No	Title
58	I-5	Treatment System P&ID 2 (MBR, Air Scour, Permeate)
59	I-6	Chemical Cleaning P&ID
60	I-7	UV and Recycled Water Storage and PS P&ID
61	I-8	Solids Drying Bed P&ID
62	I-9	Standard Instrumentation Details I

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Appendix A: NPDES Permit

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260
Phone: (760) 346-7491 • Fax: (760) 341-6820
http://www.waterboards.ca.gov/coloradoriver

ORDER R7-2017-0016
NPDES CA0105023

WASTE DISCHARGE REQUIREMENTS FOR SEELEY COUNTY WATER DISTRICT, SEELEY COUNTY WASTEWATER TREATMENT PLANT

The following Discharger is subject to waste discharge requirements (WDRs) set forth in this Order:

Table 1. Discharger Information

Discharger	Seeley County Water District
Name of Facility	Seeley County Wastewater Treatment Plant
Facility Address	1898 West Main Street
	Seeley, CA 92273
	Imperial County

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude (North)	Discharge Point Longitude (West)	Receiving Water
001	Equivalent to secondary treated Wastewater	32º, 47', 45.9"	115º, 42', 0.2"	New River (via an unnamed tributary)

Table 3. Administrative Information

This Order was adopted on:	November 9, 2017
This Order shall become effective on:	November 9, 2017
This Order shall expire on:	September 30, 2022
The Discharger shall file a Report of Waste Discharge as an application for reissuance of WDRs in accordance with title 23, California Code of Regulations, and an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	**April 3, 2022**, or as soon as possible if planned changes meet the Notice Requirement under 40 C.F.R. 122.41(l) (1).
The U.S. Environmental Protection Agency (U.S. EPA) and the California Regional Water Quality Control Board, Colorado River Basin Region classified this discharge as follows:	Minor

I, Jose Angel, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on **the date indicated above**.

Jose L. Angel

Jose L. Angel, P.E.
Executive Officer

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I. FACILITY INFORMATION

Information describing the Seeley County Water District Wastewater Treatment Plant (Facility) is summarized in Table 1 and in sections I and II of the Fact Sheet (Attachment F). Section I of the Fact Sheet also includes information regarding the Facility's permit application.

II. FINDINGS

A. Legal Authorities. This Order serves as WDRs pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this Facility to surface waters.

B. Background and Rationale for Requirements. The Colorado River Basin Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the requirements in this Order, is hereby incorporated into and constitutes Findings for this Order. Attachments A through E and G are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. The provisions/requirements in IV.G, IV.C, and V.B of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA (33 U.S.C. § 1251 et seq.); consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

D. Notification of Interested Parties. The Colorado River Basin Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of the notification are provided in the Fact Sheet.

E. Consideration of Public Comment. The Colorado River Basin Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet.

THEREFORE, IT IS HEREBY ORDERED that this Order supersedes Order R7-2012-0011, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the Colorado River Basin Water Board from taking enforcement action for violations of the previous Order.

III. DISCHARGE PROHIBITIONS

A. The discharge of waste to land is prohibited unless authorized in a separate discharge permit.

B. Discharge of treated wastewater at a location or in a manner different from that described in this Order is prohibited.

C. The discharge of trash from the Facility to the New River (via an unnamed tributary) is prohibited.

D. The bypass or overflow of untreated wastewater or wastes to the New River (via an unnamed tributary) is prohibited, except as allowed under section I.G of Attachment D, Standard Provisions.

E. The discharge of waste in excess of the design treatment or disposal capacity of the system is prohibited.

F. The discharge of waste that causes degradation of any water supply is prohibited.

G. The discharge of waste that causes a pollution or nuisance as defined in Section 13050, subdivisions (l) and (m), respectively, of the California Water Code is prohibited.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations

1. Final Effluent Limitations – Discharge Point 001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program (MRP), Attachment E:

Table 4. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	MGD	0.25	--	--	--	--
pH	Standard Units	--	--	--	6.0	9.0
Biochemical Oxygen Demand (5-day @ 20°C; BOD_5)	mg/L	45	65	--	--	--
	lbs/day[1]	94	140	--	--	--
Suspended Solids, Total (TSS)	mg/L	45	65	--	--	--
	lbs/day[1]	94	140	--	--	--
Oil and Grease, Total[2]	mg/L	--	--	25	--	--
	lbs/day[1]	--	--	52	--	--
Copper, Total Recoverable	µg/L	25	--	50	--	--
	lbs/day[1]	0.052	--	0.104	--	--
Mercury, Total Recoverable	µg/L	0.051	--	0.102	--	--
	lbs/day[1]	0.0001	--	0.0002	--	--
Cyanide, Free	µg/L	4.3	--	8.5	--	--
	lbs/day[1]	0.009	--	0.018	--	--
Bis (2-ethylhexyl) Phthalate	µg/L	5.9	--	12	--	--
	lbs/day[1]	0.012	--	0.025	--	--

[1] The mass-based effluent limitations are based on a design capacity of 0.25 MGD.

[2] Total oil and grease shall include the polar and non-polar fraction of oil and grease materials.

a. **Percent Removal:** The average monthly percent removal of biochemical oxygen demand (5-day at 20°C; BOD_5) shall not be less than 65 percent.

b. **Toxicity:** There shall be no toxicity in the treatment plant effluent. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or toxicity tests of appropriate duration or other appropriate methods specified by the Colorado River Basin Water Board as set forth in section V of Attachment E, MRP.

c. **Bacteria:** The bacterial density in the wastewater effluent discharged to the receiving water shall not exceed the following values, as measured by the following bacterial indicator:

a. ***E. coli*:** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a Most Probable Number (MPN) of 126 per 100 milliliters, nor shall any sample exceed the maximum allowable bacterial density of a MPN of 400 per 100 milliliters.

b. **Enterococci.** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 33 per 100 milliliters, nor shall any sample exceed a MPN of 100 per 100 milliliters.

c. **Fecal Coliform.** The log mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 200 per 100 milliliters, nor shall more than ten percent of the total samples during any 30-day period exceed a MPN of 400 per 100 milliliters.

d. **Total Dissolved Solids:** Discharges of wastes or wastewater shall not increase the total dissolved solids content of receiving waters, unless it can be demonstrated to the satisfaction of the Colorado River Basin Water Board that such an increase in TDS does not adversely affect beneficial uses of receiving waters.

2. Interim Effluent Limitations – Not Applicable

B. Land Discharge Specifications – Not Applicable

C. Recycling Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge from the Facility shall not cause or contribute to the following in the New River (via an unnamed tributary):

1. The concentration of dissolved oxygen in the receiving water to fall below 5.0 mg/L. When dissolved oxygen in the receiving water is already below 5.0 mg/L, the discharge shall not cause any further depression.
2. The presence of oil, grease, floating material (liquids, solids, foam and scum) or suspended material in amounts that create a nuisance or adversely affect beneficial uses.
3. The discharge of pesticides or combination of pesticides detectable in concentrations that adversely affects beneficial uses.
4. Discoloration in the receiving water that adversely affects beneficial uses.
5. The discharge of bio-stimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
6. An increase of turbidity that adversely affects beneficial uses.
7. The normal ambient pH of the receiving water to fall below 6.0 or exceed 9.0 units.

8. Altering the natural receiving water temperature unless the Discharger can demonstrate to the satisfaction of the Colorado River Basin Water that the alternation in temperature does not adversely affect beneficial uses.
9. The deposition of material that causes nuisance or adversely affects beneficial uses.
10. The discharge of an individual chemical or combination of chemicals in concentrations that adversely affect beneficial uses.
11. Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
12. An increase in taste or odor-producing substances that adversely affect beneficial uses.
13. The concentration of TDS in New River to exceed an annual average concentration of 4,000 mg/l or a maximum daily concentration 4,500 mg/l.
14. The violation of any applicable water quality standard for receiving waters adopted by the Colorado River Basin Water Board or the State Water Resources Control Board (State Water Board) as required by the Federal CWA and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to CWA section 303 or amendments thereto, the Colorado River Basin Water Board will revise and modify this Permit in accordance with such more stringent standard.

B. Groundwater Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions**. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.
2. **Colorado River Basin Water Board Standard Provisions**. The Discharger shall comply with the following provisions. In the event that there is any conflict, duplication, or overlap between the federal standard provisions included in Attachment D and the Colorado River Basin Water Board's standard provisions, the more stringent provision shall apply:

    a. The Facility shall be protected from any washout or erosion of wastes or covering material, and from any inundation, which could occur as a result of floods having a predicted frequency of once in 100 years.

    b. The Discharger shall ensure that all site-operating personnel are familiar with the contents of this Order, and shall maintain a copy of this Order at the site.

    c. The Discharger shall immediately notify the Office of Emergency Services by phone at (800) 852-7550 to report any noncompliance that may endanger human health or the environment as soon as: (1) the Discharger has knowledge of the discharge, (2) notification is possible, and (3) notification can be provided without substantially impeding cleanup or other emergency measures.

    To carry out this objective, the following notification requirements are to be implemented:

        i. For any discharges of sewage that result in a discharge to a drainage channel or surface water, the Discharger shall, as soon as possible, but not later than two (2) hours after becoming aware of the discharge, notify the State Office of Emergency Services.

ii. As soon as possible, follow the notification, reporting, monitoring, and recordkeeping requirements under WQ 2013-0058-EXEC for the Statewide Waste Discharge Requirements for Sanitary Sewer Systems. (http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2013/wqo2013_0058exec.pdf).

d. The Discharger shall provide a report to the Colorado River Basin Water Board upon determining that the treatment plant's monthly average flow rate for any month exceeds 80 percent of the design treatment or disposal capacity. The report should indicate what steps, if any the Discharger intends to take to provide for the expected wastewater treatment capacity necessary when the plant reaches design capacity.

e. In the event of any changes in ownership or management of this operation, the Discharger shall notify the Colorado River Basin Water Board of such change in writing. This Discharger shall also notify the succeeding owner or operator by letter that the new owner or operator must apply for coverage under this Order prior to discharging. The Discharger shall forward a copy of this letter to the Colorado River Basin Water Board within 30 days.

f. Prior to any modifications in this Facility, which would result in material change in the quality or, quantity of wastewater treated or discharged, or any material change in the location of discharge, the Discharger shall report all pertinent information in writing to the Colorado River Basin Water Board and if required by the Colorado River Basin Water Board obtain revised requirements before any modifications are implemented.

g. This Order does not authorize violation of any federal, state, or local laws or regulations.

h. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this Facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

i. In the event the Discharger does not comply or will be unable to comply for any reason, the Discharger shall notify the Colorado River Basin Water Board as follows:

   i. Noncompliance with any prohibition, maximum daily, average weekly, average monthly, instantaneous maximum or instantaneous minimum, or receiving water limitation of this Order,

      (a) The Discharger shall notify the Colorado River Basin Water Board by email to RB7-coloradoriver@waterboards.ca.gov within 24 hours of having knowledge of such noncompliance.

      (b) The Discharger shall submit a written report within five days of noncompliance, unless the Colorado River Basin Water Board waives confirmation. The written report shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation.

   ii. All other forms of noncompliance

(a) The Discharger shall notify the Colorado River Basin Water Board at the time monitoring reports are submitted. The Discharger shall include a written report regarding noncompliance as described in VI.A.2.i.

j. In accordance with Section 1211 of the California Water Code, the Discharger shall obtain approval from the State Water Board's Division of Water Rights prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse.

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP and future revisions thereto, in Attachment E of this Order. This MRP may be modified by the Executive Officer at any time during the term of this Order, and may include an increase in the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected or minor clarifications on MRP requirements.

C. Special Provisions

1. Reopener Provisions

a. **Standard Revisions**. This Order may be modified, rescinded and reissued, for cause. The filing of a request by the Discharger for an Order modification, rescission and reissuance, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. Causes for modification include, but are not limited to, the promulgation of new regulations, modification of land application plans, or adoption of new regulations by the State Water Board or the Colorado River Basin Water Board, including revisions to the Basin Plan.

b. **Pretreatment Program**. The Colorado River Basin Water Board may modify, or terminate and reissue, the NPDES permit if a discharger must implement a pretreatment program approved in accordance with the procedures in 40 CFR 403.11.

c. **Chronic Toxicity.** In accordance with 40 C.F.R. parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity. This Order may also be modified to address changes to U.S.EPA or State Water Board policies or guidance regarding the Whole Effluent Toxicity (WET) requirements or reporting requirements for WET testing.

d. **303(d) Listed Pollutants.** If new or revised water quality objectives or Total Maximum Daily Loads (TMDLs) come into effect for the New River (discharge via an unnamed tributary), the effluent limitations in this Order may be modified as necessary to reflect any updated water quality objectives and TMDL wasteload allocations.

e. **Reasonable Potential.** This Order may be modified, or revoked and reissued, if present of future investigations demonstrate that the Discharger is causing or contributing to excursions above any applicable water quality standard, or adversely impacting water quality and/or the beneficial uses of receiving waters.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Toxicity Reduction Evaluation (TRE) Plan**

The Discharger has been updating the TRE Work Plan annually to the Colorado River Basin Water Board to comply with the requirements of Order No. R7-2012-

v. Public contact with undisinfected wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

vi. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal area.

vii. Ponds shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, ancillary inflow, and infiltration. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

b. **Facility and Treatment Operation**

i. The Discharger shall, at all times, properly operate and maintain all systems and components of collection, treatment and control which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance includes effective performance, adequate process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of this Order. All systems, both in-service and reserved, shall be inspected and maintained on a regular basis. Records shall be kept of the inspection results and maintenance performed and made available to the Colorado River Basin Water Board upon demand.

ii. Temporary power or adequate storage capacity shall be provided to maintain the plant in operation in the event of commercial power failure.

iii. Adequate measures shall be taken to assure that unauthorized persons are effectively excluded from contact with the wastewater disposal facilities.

iv. The Discharger shall implement acceptable operation and maintenance at the Facility so that needed repair and maintenance are performed in a timely manner.

c. **Anti-degradation Analysis and Engineering Report for Significant Expansion**

If discharges from a new or an existing facility will undergo significant expansion[1] within the next 5 years, the Discharger shall submit an anti-degradation analysis report to the Colorado River Basin Water Board's Executive Officer for review and approval. The anti-degradation analysis report must be developed in accordance with the State Anti-degradation Policy (Resolution No. 68-16) and the Federal Anti-degradation Policy (40 C.F.R. section 131.12). The report shall consider any potential impacts the discharge may have on the receiving water quality and the receiving water body's designated beneficial uses, as defined in the Basin Plan. In addition, the report shall include information on the quality of the proposed discharge and evaluate the potential impacts of the discharge; provide CEQA documentation for the proposed project; a summary that identifies whether the proposed discharge will result in degradation of water quality. In addition, the report shall include as an attachment any CEQA documentation for the proposed project.

d. **Spill Response Plan**

[1] Significant expansion means an increase in permitted design flow of greater than 10% or changes to the Facility and/or changes in the nature and character of the discharge that may result in an incremental increase in pollutants discharged to the receiving water body of greater than 10% of the permitted discharge rates. When a new or existing facility undergoes significant expansion, the discharge shall be evaluated on a pollutant by pollutant basis.

The Discharger developed and submitted to the Colorado River Basin Water Board a Spill Response Plan (SRP) to comply with the requirements of Order R7-2012-0011. The Discharger shall review and update the existing SRP on an annual basis. The Discharger shall submit the updated SRP with each Annual Report. The Discharger shall make the SRP available for staff review during Colorado River Basin Water Board inspections. The Discharger shall ensure that all operating personnel are familiar with the contents of the SRP. A copy of the SRP shall be maintained at the site and shall be accessible to all operating personnel.

5. Special Provisions for Publicly-Owned Treatment Works (POTWs)

a. **Pretreatment**

i. In the event that (i) the Facility has a treatment capacity greater than 5 MGD and Industrial Users [40 C.F.R. § 403.3(j)] are discharging pollutants which Pass Through [40 C.F.R. § 403.3(p)] or Interfere [40 C.F.R. § 403.3(k)] with the operation of the wastewater treatment facility or are otherwise subject to National Pretreatment Standards [40 C.F.R. § 403.3(l)], (ii), Section 2233 of title 23 of the CCRs requires the Facility to have and enforce an adequate pretreatment program, or (iii) the Colorado River Basin Water Board or its Executive Officer determines that other circumstances warrant in order to prevent Interference with the wastewater treatment facility or Pass Through, then:

(a) The Discharger shall be responsible for the compliance with all pretreatment requirements contained in 40 C.F.R part 403, and shall be subject to enforcement actions, penalties, and other remedies by the U.S. EPA, or the Colorado River Basin Water Board, as provided in the CWA.

(b) Within one year of notification that a pretreatment program in required, the Discharger shall submit a formal Pretreatment Program for approval by the Colorado River Basin Water Board.

(c) The Discharger must seek approval of its Pretreatment Program from the Colorado River Basin Water Board in accordance with the procedures in 40 CFR 403.11.

b. **Collection Systems**

i. **Collection System.** The Discharger is subject to the requirements of, and must comply with, State Water Board Order 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems as amended by State Water Board Order WQ 2013-0058-EXEC and any subsequent order. The Sanitary Sewer Order requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans and report all SSOs to the State Water Board's online SSO database. The WDID number is 7SSO11515.

6. Other Special Provisions

a. The Discharger may be required to submit technical reports as directed by the Colorado River Basin Water Board's Executive Officer.

b. The Discharger shall exclude from the wastewater treatment plant any liquid or solid waste that could adversely affect the plant operation or effluent quality. The excluded liquid or solid waste shall be disposed of in accordance with applicable regulations.

7. Compliance Schedules

a. **Deliverables and Due Dates.** The Discharger shall comply with the following schedule of Remedial Measures as summarized in Table 5:

Table 5. Schedule of Remedial Measures

Activity	Description	Due Date
Spill Response Plan VI.C.4.d.	The Discharger shall update the Spill Response Plan (SRP). The SRP shall be updated annually and available for inspection.	Annual updates submitted yearly to Colorado River Basin Water Board with Annual Report.
Toxicity Reduction Evaluation (TRE) Workplan VI.C.2.a.	The Discharger shall review and update the existing TRE Work Plan, and submit it to the Colorado River Basin Water Board. The Work Plan should include a description of steps the Discharger will take in the event toxicity is detected.	Within 90 days of the effective date of this Order.
TDS Study VI.C.2.c	Annual update on status of its programs and activities to reduce TDS discharges into the receiving water body.	Annual updates submitted yearly to Colorado River Basin Water Board with Annual Report, and submit a final summary report with renewal application.
Anti-degradation Analysis and Engineering Report for Significant Expansion VI.C.4.c	Discharges from a new or an existing facility that will undergo significant expansion within the next 5 years shall be required to submit an anti-degradation analysis report to the Colorado River Basin Water Board's Executive Officer for review and approval.	Prior to start of construction of significant changes to the treatment plant and to be submitted to Colorado River Basin Water Board's Executive Officer.
Pollutant Minimization Program (PMP) for Priority Pollutants, VI.C.3.a	The Discharger shall develop a PMP when there is evidence a priority pollutant is present in the effluent above an effluent limitation and either the sample result is reported as DNQ and the effluent limitation is less than the RL; or a sample result is reported as ND and the effluent limitation is less than the MDL.	Upon evidence of priority pollutant in effluent and to be submitted to Colorado River Basin Water Board.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined in the MRP and VII. of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the Reporting Level (RL).

B. Multiple Sample Data.

When determining compliance with an Average Monthly Effluent Limitation (AMEL), Average Weekly Effluent Limitation (AWEL) and Maximum Daily Effluent Limitation (MDEL) for pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

C. Average Monthly Effluent Limitation (AMEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month), where no data is available to show compliance. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

D. Average Weekly Effluent Limitation (AWEL).

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar week exceeds the AWEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance where no data is available to show compliance. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance for that calendar week. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week. The analytical result for comparison of the AWEL shall be reported on the ending Saturday of the calendar weeks within the reporting month.

For the beginning of the month, if samples are collected during the calendar week in the previous month and the ending Saturday is in the Calendar Month of reporting, the Discharger shall report the results of the samples collected in the previous week and report the analytical result on the ending Saturday of the Calendar Month of reporting.

For the end of the month, if the ending Saturday falls on the following month no analytical result for comparison of the AWEL is required, however, any samples collected during the last calendar week shall be reported.

E. Maximum Daily Effluent Limitation (MDEL).

If a daily discharge (or when applicable, the median determined by subsection B above for multiple sample data of a daily discharge) exceeds the MDEL for a given parameter, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

For multiple samples collected in a calendar day, the maximum daily value is the average of the samples collected in a calendar day, or when applicable, the median as determined by subsection B, above.

F. Instantaneous Minimum Effluent Limitation.

If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation). There are no mass limits are for instantaneous minimum effluent limitations.

G. Instantaneous Maximum Effluent Limitation.

If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation). There are no mass limits for instantaneous maximum effluent limitations.

H. Effect of Conducting a Pollutant Minimization Program (PMP).

If a sample result for a priority pollutant, or the arithmetic mean or median of multiple sample results is below the RL, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a PMP for the priority pollutant (as described in Provision VI.C.3.a.), the Discharger shall not be deemed out of compliance.

I. Compliance with Single Constituent Effluent Limitations.

Dischargers shall be deemed out of compliance with an effluent limitation if the concentration of a pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

J. Mass and Concentration Limitation

Compliance with mass and concentration effluent limitations for the same parameter shall be determined separately with their respective limitations. When the concentration of a constituent in an effluent sample is determined to be ND or DNQ, the corresponding mass emission rate (MER) determined from that sample concentration shall also be reported as ND or DNQ.

K. Percent Removal

Compliance with the secondary treatment standard for monthly average percent removal of biochemical oxygen demand and total suspended solids, pursuant to 40 C.F.R. part 133, shall be determined separately for each wastewater treatment facility discharging through an outfall. For each wastewater treatment facility, the monthly average percent removal is the average of the calculated daily discharge percent removals only for days on which the constituent concentrations is monitored in both the influent and effluent of the wastewater treatment facility at locations specified in the MRP (Attachment E) within a calendar month.

The percent removal for each day (Daily Percent Removal) shall be calculated according to the following equation:

$$\text{Daily Percent Removal} = \frac{(\text{Daily Influent Concentraton} - \text{Daily Effluent Concentraton})}{\text{Daily Influent Concentraton}} * 100$$

The percent removal for the month (Monthly Percent Removal) shall be calculated according to the following equation:

$$\text{Monthly Percent Removal} = \frac{(\text{Sum of the Daily Percent Removal})}{\text{Number of Daily Percent Removal Values}}$$

L. Chronic Toxicity Narrative Language.

Reasonable potential for toxicity for this discharge has not been determined, hence effluent chronic toxicity limit based on WET tests do not exist. However, compliance with narrative effluent limitations established in the Order comprises the determination of "Pass" or "Fail" from a chronic toxicity test using the Test of Significant Toxicity (TST) statistical t-test approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010). The Discharger must report either "Pass" or "Fail" and the Percent Effect as required in the Monitoring and Reporting Program, section V. If a result is reported as "Fail", the Discharger must follow the requirements in MRP, section V.A, Chronic Toxicity Testing, to initiate an accelerated monitoring schedule or conduct a TRE.

M. Bacterial Effluent Limitations.

Compliance with the bacterial effluent limitations established in section IV.A.5.a of this Order shall be determined as follows:

1. If the calculated geometric mean bacterial concentrations for Enterococci, *E. coli* or log mean for fecal Coliform exceed the 30-day geometric mean (or log mean for fecal coliform) effluent limitations summarized in the Effluent Limitations and Discharge Requirements section IV.A.1.c of this Order or more than ten percent of the bacterial concentrations for fecal coliform exceed 400 MPN per 100 milliliters, this will represent a single violation of the water quality-based effluent limitation for bacteria and the Discharger will be considered out of compliance for the month in which the samples were collected.
2. If the bacterial concentrations for Enterococci, *E. coli* or fecal Coliform exceed the maximum bacterial densities summarized in the Effluent Limitations and Discharge Requirements section IV.A.1.c of this Order, this will represent a single violation of the water quality-based effluent limitation for bacteria and the Discharger will be considered out of compliance for the day in which the sample(s) were collected.

N. Total Dissolved Solids (TDS)

Compliance with the narrative TDS effluent limitation shall be determined based on the receiving water TDS concentration. If the TDS concentration in effluent exceeds the highest TDS concentration in receiving water, New River (via an unnamed tributary), regardless of upstream or downstream of the receiving water, the Discharger will be considered out of compliance for that Quarter, unless the Discharger can demonstrate the increase did not adversely affect beneficial uses. The receiving water data used to determine compliance should be the sample collected within the same quarterly monitoring period. At all times, the TDS concentration in the effluent shall not cause the receiving water to exceed an annual average concentration of 4,000 mg/l or a maximum daily concentration of 4,500 mg/l.

O. Singles Operational Upset (SOU)

A Single Operational Upset[1] (SOU) that leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. For the purposes of CWC sections

[1] Section 13385(f) is the same as Clean Water Act section 309(c)(5) (33 U.S.C. section 1319(c)(5)), and must be interpreted consistent with federal law. U.S. EPA defines "single operational upset" as "an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one CWA effluent discharge pollutant parameter. Single operational upset does not include... noncompliance to the extent caused by improperly designed or inadequate treatment facilities" ("Issuance of Guidance Interpreting Single

(h) and (j), an SOU in a wastewater treatment unit that treats wastewater using a biological treatment process shall be treated as a single violation, even if the operational upset results in violations of more than one effluent limitation and the violations continue for a period of more than one day, if all the criteria at Water Code sections 13385(f)(2)(A)(i) and (ii) apply. (Water Code section 13385(f)(2)(A).).

Water Code section 13385(f)(2)(A) only applies to violations that occur during a period for which the Regional Water Board has determined that violations are unavoidable, but in no case may that period exceed 30 days. (Water Code section 13385(f)(2)(B).). The discharger has the burden of demonstrating a single operational upset occurred. A finding that a single operational upset has occurred is not a defense to liability, but may affect the number of violations.

P. Significant Figures

The Discharger shall report monitoring and calculation results with regard to significant figures consistent with tabulated values in Table 4 (Effluent Limitations).

Operational Upset" Memorandum from the Associate Enforcement Counsel, Water Division, U.S.EPA, September 27, 1989.). The EPA Guidance further defines an "exceptional" incident as a "non-routine malfunctioning of an otherwise generally compliant facility."

ATTACHMENT A – DEFINITIONS

Acute Toxicity Test
Acute toxicity test is a test to determine the concentration of effluent or ambient waters that causes an adverse effect (usually mortality) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). Acute toxicity is determined using statistical procedures (e.g., point estimates or a t-test).

Ambient Toxicity
Ambient toxicity is measured by a toxicity test on a sample collected from a receiving waterbody.

Annual Average Effluent Limitation
The highest allowable average of monthly discharges over a calendar year, calculated as the sum of all monthly discharges measured during a calendar year divided by the number of monthly discharges measured during that year.

Arithmetic Mean (μ)
Also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL)
The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

For the AMEL concentration limit, it is the sum of the measured sample values divided by the number of samples for the month.

For the AMEL mass loading limit, it is the sum of the product of the flow rate (MGD) x measured sample value (mg/L) x 8.34 divided by the number of samples for the month.

Average Weekly Effluent Limitation (AWEL)
The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Management Practices (BMPs)
BMPs are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and non-point discharges including storm water. BMPs include structural and non-structural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

Bioaccumulative
Those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Biosolids
Biosolids refer to non-hazardous sewage sludge as defined in 40 C.F.R. section 503.9.

Carcinogenic
Pollutants are substances that are known to cause cancer in living organisms.

Chronic Toxicity Tests
Chronic toxicity tests measure the sub-lethal effects of a discharge (e.g. reduced growth or reproduction). Certain chronic toxicity tests include an additional measurement of lethality.

Coefficient of Variation (CV)
CV is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Criteria Continuous Concentration (CCC)
Criteria Continuous Concentration equals the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (e.g., 4 days) without deleterious effects.

Criteria Maximum Concentration (CMC)
Criteria Maximum Concentration equals the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (e.g., 1 hour) without deleterious effects.

Daily Discharge
Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ)
DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

Dilution Credit
Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Domestic Sewage
Domestic Sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Effect Concentration (EC)
Effect concentration is a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g., mortality, fertilization). EC25 is a point estimate of the toxicant concentration that would cause observable 25% adverse effect as compared to the control test organisms.

Effluent Concentration Allowance (ECA)
ECA is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays
Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration
The estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries
Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Existing Discharger
Any Discharger that is not a new Discharger. An existing Discharger includes an "increasing Discharger" (i.e., an existing facility with treatment systems in place from its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after the effective date of the State Implementation Policy).

Geometric Mean
Geometric mean, is a measure of the central tendency of a data set that minimizes the effects of extreme values. The geometric mean used for determining compliance with bacterial standards is calculated with the following equation:

Geometric Mean = $(C_1 \times C_2 \times \ldots \times C_n)^{1/n}$ where n = the number of days samples were collected during the period, and C = the concentration of bacteria (CFU*/100 mL) found on each day of sampling.

*Effluent limitations for bacterial density are expressed in units of a Most Probable Number per 100 milliliters (MPN/100 ml). This calculation of geometric mean is also applicable and shall be used to determine compliance with bacterial effluent limitations.

Group I Pollutants
The list of pollutants is based on Appendix A to 40 C.F.R § 123.45. The State Water Board enforcement policy located at

http://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf provides the list in Appendix C: Group 1 Pollutants.

Group 2 Pollutants
The list of pollutants is based on Appendix A to 40 C.F.R § 123.45. The State Water Board enforcement policy located at http://www.waterboards.ca.gov/water_issues/programs/enforcement/docs/enf_policy_final111709.pdf provides the list in Appendix D: Group 2 Pollutants.

Hypothesis Testing
Hypothesis testing is a statistical approach (e.g., Dunnett's procedure) for determining whether a test concentration is statistically different from the control. Endpoints determined from hypothesis testing are no observed effect concentration (NOEC) and lowest observed effect concentration (LOEC).

Incompletely Mixed Discharge
A discharge that contributes to a condition that does not meet the meaning of a completely-mixed discharge condition.

Infeasible
Infeasible means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Inhibition Concentration
Inhibition concentration is a point estimate of the toxicant concentration that would cause a given, percent reduction in a non-lethal biological measurement (e.g., reproduction or growth), calculated from a continuous model (i.e., Interpolation Method). For example, IC25 is a point estimate of the toxicant concentration that would cause a 25 percent reduction in a non-lethal biological measurement.

Inland Surface Waters
All surface waters of the state that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation
The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation
The lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

In-Stream Waste Concentration
In-stream waste concentration (IWC) is the concentration of a toxicant or effluent in the receiving water after mixing. The IWC is the inverse of the dilution factor. It is sometimes referred to as the receiving water concentration (RWC

LC50
LC50 (lethal concentration, 50%) is the toxicant or effluent concentration that would cause death to 50 percent of the test organisms.

Load Allocation
The portion of a receiving water's total maximum daily load that is allocated to one of its non-point sources of pollution or to natural background sources.

Lowest Observed Effect Concentration

Lowest observed effect concentration (LOEC) is the lowest concentration of an effluent or toxicant that results in statistically significant adverse effects on the test organisms (i.e., where the values for the observed endpoints are statistically different from the control).

Maximum Daily Effluent Limitation (MDEL)
The highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median
The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1)/2}$ (i.e., the midpoint between the n/2 and n/2+1).

Method Detection Limit (MDL)
MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 C.F.R. part 136, Attachment B, revised as of May 18, 2012.

Minimum Level (ML)
ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Minimum Significant Difference (MSD)
Minimum significant difference is the magnitude of difference from control where the null hypothesis is rejected in a statistical test comparing a treatment with a control. MSD is based on the number of replicates, control performance, and power of the test.

Mixing Zone
The Colorado River Basin Water Board does not have a mixing zone policy in the Basin Plan. Therefore, in order for a mixing zone to be allowed in the Colorado River Basin Region, it would be only pursuant to a State policy. The State Implementation Policy (SIP) allows a mixing zone for priority pollutants and toxicity. Accordingly, a mixing zone applies to the Colorado River Basin Region under this State policy.

The SIP requires a mixing zone analysis be completed before any dilution credit is granted. Following completion of the mixing zone study, the Colorado River Basin Water Board must reconsider the receiving water limitations to ensure that they are as stringent as necessary to fully protect the receiving water.

Municipality
Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of CWA.

New Discharger

New Discharger includes any building, structure, facility, or installation from which there is, or may be, a discharge of pollutants, the construction of which commenced after the effective date of the State Implementation Policy.

No Observed Effect Concentration (NOEC)
No observed effect concentration is the highest tested concentration of an effluent or toxicant that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant at which the values for the observed responses are not statistically different from the control).

Not Detected (ND)
Sample results which are less than the laboratory's MDL.

Objectionable Bottom Deposits
Objectionable Bottom Deposits are an accumulation of materials or substances on or near the bottom of a water body, which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments and other conditions that result in harm to benthic organisms, production of food chain organisms, or fish egg development. The presence of such deposits shall be determined by Colorado River Basin Water Board(s) on a case-by-case basis.

Ocean Waters
Not Applicable.

Percent Effect
The percent effect represents the difference between the response of the species at the IWC (i.e., 100% effluent) and the response in the control sample, relative to the control sample, as a percentage. The percent effect at IWC can be calculated as follows:

$$\text{Percent Effect} = \frac{(\text{Control Mean Response} - \text{IWC Mean Response})}{\text{Control Mean Response}} * 100$$

Persistent Pollutants
Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

PET Tool
The PET tool is a Microsoft Excel file that allows you to configure your data into a format that CIWQS will understand and interpret correctly, which is the CIWQS Data Format, or CDR. You can open the PET Tool in Excel, configure it on the basis of your permit requirements, and then use the configured file as a template for entering data during the different reporting frequency and periods.

Pollutant Minimization Program (PMP)
PMP means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Colorado River Basin Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention
Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State Water Board or Colorado River Basin Water Board.

Potable Water
Water that is safe for drinking and cooking and is in compliance with the State Water Board Division of Drinking Water or local county health department regulations.

Public Entity
Public Entity includes the Federal government or a state, county, city and county, city, district, public authority, or public agency.

Publicly Owned Treatment Works (POTW)
POTW means a treatment works as defined in 40 C.F.R. 212, which is owned by a State or municipality. This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in 40 C.F.R. 502(4), which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works.

Quality Assurance (QA)
Quality assurance is a practice in toxicity testing that addresses all activities affecting the quality of the final effluent toxicity data. QA includes practices such as effluent sampling and handling, source and condition of test organisms, equipment condition, test conditions, instrument calibration, replication, use of reference toxicants, recordkeeping, and data evaluation.

Quality Control (QC)
Quality control is the set of more focused, routine, day-to-day activities carried out as part of the overall QA program.

Reference Toxicant Test
Reference toxicant test is a check of the sensitivity of the test organisms and the suitability of the test methodology. Reference toxicant data are part of a routine QA/QC program to evaluate the performance of laboratory personnel and the robustness and sensitivity of the test organisms.

Replicate
Replicate is two or more independent organism exposures of the same treatment (i.e., effluent concentration) within a whole effluent toxicity test. Replicates are typically separate test chambers with organisms, each having the same effluent concentration.

Report of Waste Discharge
For the purposes of this Individual Board Order, references to the Report of Waste Discharge (ROWD) shall include the California Form 200, U.S. EPA forms and any other application information submitted to the Colorado River Basin Water Board.

Reporting Level (RL)

The RL is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order, including an additional factor if applicable as discussed herein. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Colorado River Basin Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Sample
Sample is a representative portion of a specific environmental matrix that is used in toxicity testing.

Satellite Collection System
The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Serious Violation
For discharges of pollutants subject to the State Water Board's "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," or the "California Ocean Plan", where the effluent limitation for a pollutant is lower than the applicable Minimum Level, any discharge that: (1) equals or exceeds the Minimum Level; and (2) exceeds the effluent limitation by 40 percent or more for a Group 1 pollutant or by 20 percent or more for a Group 2 pollutant, is a serious violation for the purposes of California Water Code section 13385(h)(2).
For discharges of pollutants that are not subject to the State Water Board's "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," or the California Ocean Plan (e.g., pollutants that are not addressed by the applicable plan) where the effluent limitation for a pollutant is lower than the quantification limit specified or authorized in the applicable waste discharge requirements or monitoring requirements, any discharge that: (1) equals or exceeds the quantification limit; and (2) exceeds the effluent limitation by 40 percent or more for a Group 1 pollutant or by 20 percent or more for a Group 2 pollutant, is a serious violation for the purposes of California Water Code section 13385(h)(2).

Sewage Sludge
Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. Sewage sludge that has been classified as hazardous shall be disposed in accordance with 40 C.F.R. 261.

Sewage Sludge, Class A
Sewage Sludge to be classified Class A with respect to pathogens shall comply with the requirements in 40 C.F.R. 503.32(a)(2) and the requirements in either 40 C.F.R. 503.32(a)(3), (a)(4), (a)(5), (a)(6), (a)(7), or (a)(8).

Sewage Sludge, Class B
Sewage Sludge to be classified Class B with respect to pathogens shall comply with the requirements in either 40 C.F.R. 503.32(b)(2), (b)(3), or (b)(4).

Significant Difference
Significant difference is a statistically significant difference (e.g., 95 percent confidence level) in the means of two distributions of sampling results.

Significant Expansion

Significant expansion means an increase in permitted design flow of greater than 10% or changes to the Facility and/or changes in the nature and character of the discharge that may result in an incremental increase in pollutants discharged to the receiving water body of greater than 10% of the permitted discharge rates. When a new or existing facility undergoes significant expansion, the discharge shall be evaluated on a pollutant by pollutant basis.

Significant Figures
Significant figures of a number are those digits that carry meaning contributing to its precision. When adding or subtracting values with different degrees of precision, the last digit retained is determined by the least precise number (i.e., the answer should contain no digits farther to the right of the least precise number). For example:

$$\begin{array}{r} 37.24 \\ +10.3 \\ \hline 47.54 \end{array}$$ is rounded to 47.5

When multiplying or dividing values with different degrees of precision, the number of significant figures in the answer equals that of the quantity that has the smallest number of significant figures. For example:

$\overbrace{113.2}^{4} \times \overbrace{1.43}^{3} = \overbrace{161.876}^{6}$ is rounded to $\overbrace{162}^{3}$

1. Additional Information on significant figures.
   a. All nonzero digits are significant.
   b. Zeros between nonzero digits are significant (e.g., 1.005 mg has four significant figures.
   c. When a number ends in zeros to the right of a decimal point, they are significant (0.00500 has three significant figures).
   d. When a number ends in zeros that are not to the right of a decimal point, significant figures are indeterminable (e.g., 10300 kg).
   e. Only measurements have a limited number of significant figures. Given values, constants, etc. are assumed to have an infinite number of significant figures.
   f. In addition, 40 C.F.R. part 136 specifies for some analytical methods, the number of significant figures to which measurements are made. The Discharger shall ensure laboratory analytical results are consistent with the requirements contained in 40 C.F.R. part 136 with regard to significant figures.

Source of Drinking Water
Any water designated as municipal or domestic supply (MUN) in the Colorado River Basin Water Board's Basin Plan.

Standard Deviation (σ)
Standard Deviation is a measure of variability that is calculated as follows:

$$\sigma = (\Sigma[(x - \mu)^2]/(n - 1))^{0.5}$$

where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

State Implementation Policy (SIP)
The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Statistic
Statistic is a computed or estimated quantity such as the mean, standard deviation, or Coefficient of Variation.

Technology-Based Effluent Limitation
A technology-based effluent limitation is a permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration.

Teratogenic
Teratogenic pollutants are substances that are known to cause structural abnormalities or birth defects in living organisms.

Test Acceptability Criteria (TAC)
Test acceptability criteria are test method-specific criteria for determining whether toxicity test results are acceptable. The effluent and reference toxicant must meet specific criteria as defined in the test method (e.g., for the Ceriodaphnia dubia survival and reproduction test, the criteria are as follows: the test must achieve at least 80 percent survival and an average of 15 young per surviving female in the control and at least 60% of surviving organisms must have three broods).

Total Maximum Daily Load (TMDL)
A TMDL is the sum of the individual waste load allocations and load allocations for receiving water. A margin of safety is included with the two types of allocations so that any additional loading, regardless of source, would not produce a violation of water quality standards.

Total Solids
Total Solids are the materials that remain as residue when dried at 103 to 105 degrees Celsius.

Toxicity Reduction Evaluation (TRE)
TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of Facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Test
Toxicity test is a procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.

Treatment Works
Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

t-Test
t-Test (formally Student's t-Test) is a statistical analysis comparing two sets of replicate observations, in the case of WET, only two test concentrations (e.g., a control and IWC). The purpose of this test is to determine if the means of the two sets of observations are different (e.g., if the 100-percent effluent or ambient concentration differs from the control [i.e., the test passes or fails]). The statistical significance (i.e., pass/fail) of a two-sample test can be determined with either a standard t-test (if homogeneity of variance is achieved) or a modified t-test (if homogeneity of variance is not achieved) and where:

Type I Error (alpha α) is the error of rejecting the null hypothesis (Ho) that should have been accepted, and

Type II Error (beta β) is the error of accepting the null hypothesis (Ho) that should have been rejected.

Vector Attraction
Vector Attraction is the characteristic of a material that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Waste Load Allocation (WLA)
The portion of a receiving water's total maximum daily load that is allocated to one of its existing or future point sources of pollution.

Welch's t-Test
Welch's t-Test is an adaptation of the Student's t-test intended for use with two samples having unequal variances.

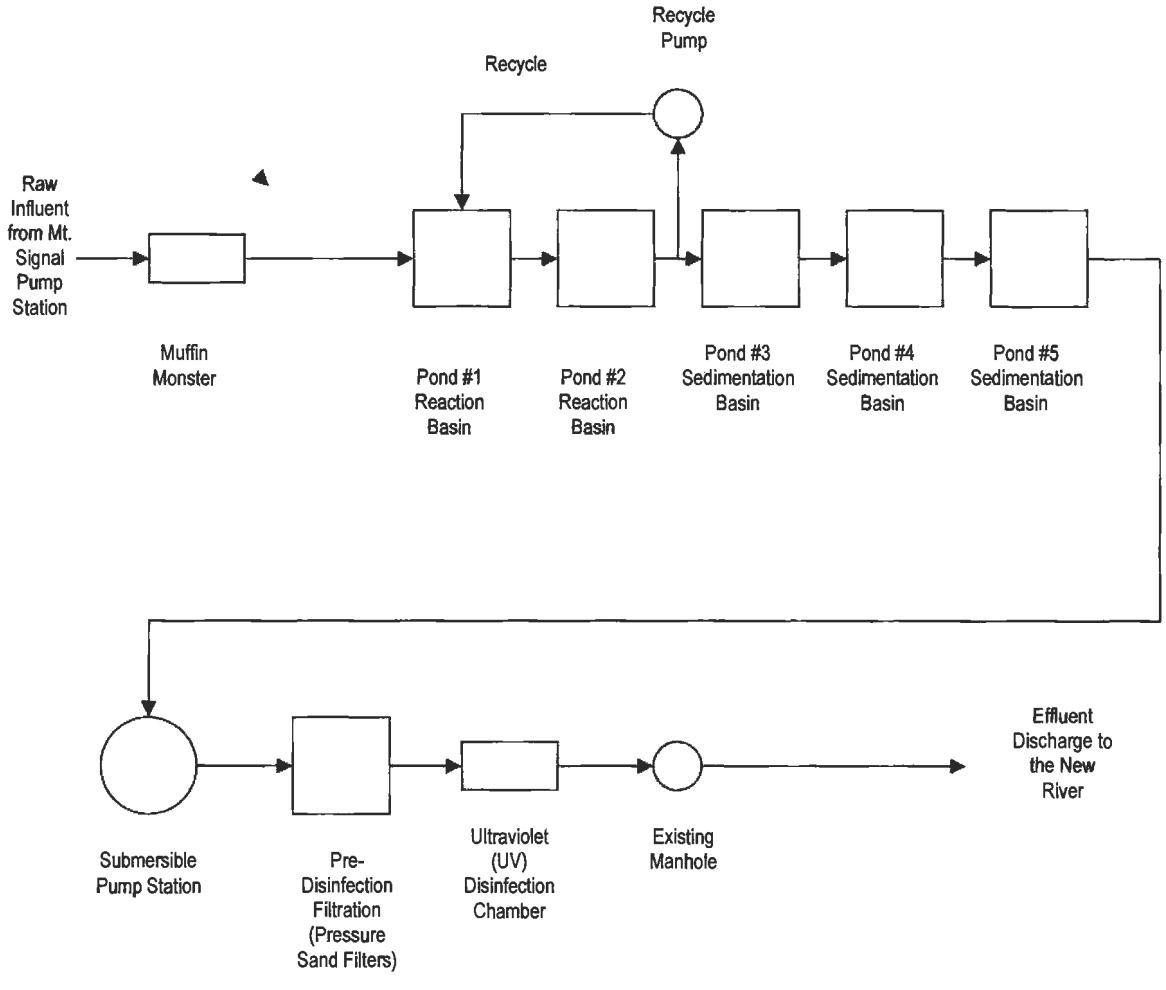
Whole Effluent Toxicity (WET)
The aggregate toxic effect of an effluent measured directly by a toxicity test.

ATTACHMENT B – MAP



SEELEY COUNTY WATER DISTRICT
SEELEY COUNTY WASTEWATER TREATMENT PLANT
Seeley - Imperial County
Facility Location – NE ¼ of the NW ¼ of Section 11, T16S, R12E, SBB&M
Discharge to New River - N32° 47' 45" W115° 42' 10"

ATTACHMENT C – FLOW SCHEMATIC



ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the terms, requirements, and conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; denial of a permit renewal application; or a combination thereof. (40 C.F.R. § 122.41(a); Wat. Code §§ 13261, 13263, 13265, 13268, 13000, 13001, 13304, 13350, 13385.)

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Colorado River Basin Water Board, State Water Board, U.S. EPA, and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i); Wat. Code, §§ 13267, 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (33 U.S.C. § 1318(a)(4)(B)(i); 40 C.F.R. § 122.41(i)(1); Wat. Code, §§ 13267, 13383);

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(2); Wat. Code, §§ 13267, 13383);

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(3); Wat. Code, §§ 13267, 13383); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i)(4); Wat. Code, §§ 13267, 13383.)

G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)

   b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 C.F.R. § 122.41(m)(1)(ii).)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Colorado River Basin Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):

   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(A));

   b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 C.F.R. § 122.41(m)(4)(i)(B)); and

   c. The Discharger submitted notice to the Colorado River Basin Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. §122.41(m)(4)(i)(C).)

4. The Colorado River Basin Water Board may approve an anticipated bypass, after considering its adverse effects, if the Colorado River Basin Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)

5. Notice

   a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. As

of December 21, 2020 all notices must be submitted electronically by the Discharger to the initial recipient, as defined in 40 C.F.R. section 127.2(b), in compliance with this section and 40 C.F.R. part 3 (including, in all cases, subpart D of part 3), section 122.22, and 40 C.F.R. part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the Discharger may be required to report electronically if specified by a particular permit or if required to do so by state law. (40 C.F.R. § 122.41(m)(3)(i).)

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). As of December 21, 2020 all notices must be submitted electronically by the Discharger to the initial recipient, as defined in 40 C.F.R. section 127.2(b), in compliance with this section and 40 C.F.R. part 3 (including, in all cases, subpart D of part 3), section 122.22, and 40 C.F.R. part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the Discharger may be required to report electronically if specified by a particular permit or if required to do so by state law. (40 C.F.R. § 122.41(m)(3)(ii).))

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 C.F.R. § 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 C.F.R. § 122.41(n)(2).)
2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 C.F.R. § 122.41(n)(3)):
   a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));
   b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));
   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and
   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a

notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Colorado River Basin Water Board. The Colorado River Basin Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § §122.41(l)(3); 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

B. Monitoring must be conducted according to test procedures approved under 40 C.F.R. part 136 for the analyses of pollutants unless another method is required under 40 C.F.R. subchapter N. Monitoring must be conducted according to sufficiently sensitive test methods approved under 40 C.F.R. part 136 for the analysis of pollutants or pollutant parameters or as required under 40 C.F.R. chapter 1, subchapter N or O. For the purposes of this paragraph, a method is sufficiently sensitive when:

1. The method minimum level (ML) is at or below the level of the most stringent effluent limitation established in the permit for the measured pollutant or pollutant parameter, and either the method ML is at or below the level of the most stringent applicable water quality criterion for the measured pollutant or pollutant parameter or the method ML is above the applicable water quality criterion but the amount of the pollutant or pollutant parameter in the facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or
2. The method has the lowest ML of the analytical methods approved under 40 C.F.R. part 136 or required under 40 C.F.R. chapter 1, subchapter N for the measured pollutant or pollutant parameter.

In the case of pollutants or pollutant parameters for which there are no approved methods under 40 C.F.R. part 136 or otherwise required under 40 C.F.R. chapter 1, subchapters N or O, monitoring must be conducted according to a test procedure specified in this Order for such pollutants or pollutant parameters. (40 C.F.R. §§ 122.21(e)(3), 122.41(j)(4), 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Colorado River Basin Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));
2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));
3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));
4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));
5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and
6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Colorado River Basin Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the Colorado River Basin Water Board, State Water Board, or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Colorado River Basin Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, §§ 13267, 13383.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Colorado River Basin Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)
2. All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 C.F.R. § 122.22(a)(3).).
3. All reports required by this Order and other information requested by the Colorado River Basin Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
   a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));
   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus

be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and

c. The written authorization is submitted to the Colorado River Basin Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Colorado River Basin Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

6. If documents described in Standard Provisions – V.B.1, V.B.2, or V.B.3 are submitted electronically by or on behalf of the NPDES-regulated facility, any person providing the electronic signature for such documents shall meet all relevant requirements of Standard Provisions – Reporting V.B, and shall ensure that all of the relevant requirements of 40 C.F.R. part 3 (including, in all cases, subpart D of part 3) (Cross-Media Electronic Reporting) and 40 C.F.R. part 127 (NPDES Electronic Reporting Requirements) are met for that submission. (40 C.F.R § 122.22(e).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.41(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Colorado River Basin Water Board or State Water Board. As of December 21, 2016 all reports and forms must be submitted electronically by the Discharger to the initial recipient, as defined in Standard Provisions – Reporting V.J, in compliance with this section and 40 C.F.R. part 3 (including, in all cases, subpart D of part 3), section 122.22, and 40 C.F.R. part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the Discharger may be required to report electronically if specified by the permit or if required to do so by state law. (40 C.F.R. § 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 C.F.R. part 136, or another method required for an industry-specific waste stream under 40 C.F.R. subchapter N, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or reporting form specified by the Colorado River Basin Water Board or State Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A report shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR § 122.41 (l)(6)(i).)

2. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events, these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflow structure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather. As of December 21, 2020 all reports related to combined sewer overflows, sanitary sewer overflows, or bypass events must be submitted electronically by the Discharger to the initial recipient, as defined in Standard Provisions – Reporting V.J, in compliance with this section and 40 C.F.R. part 3 (including in all cases, subpart D of part 3), section 122.22, and 40 C.F.R. part 127. Part 127 is not intended to undo existing requirements for electronic reporting. Prior to this date, and independent of part 127, the Discharger may be required to electronically submit reports related to combined sewer overflows, sanitary sewer overflows, or bypass events under this section by a particular permit or if required to do so by state law.

3. The flowing shall be included as information that must be reported within 24 hours under this paragraph (40 CFR § 122.41(l)(6)(ii):

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR § 122.41 (l)(6)(ii)(A).)

   b. Any upset that exceeds any effluent limitation in this Order. (40 CFR § 122.41 (l)(6)(ii)(B).)

4. The Colorado River Basin Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Colorado River Basin Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 C.F.R. § 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 C.F.R. § 122.41(l)(1)(ii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Colorado River Basin Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order's requirements. (40 C.F.R. § 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Colorado River Basin Water Board, State Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

J. Identification of the Initial Recipient for NPDES Electronic Reporting Data

The owner, operator, or the duly authorized representative of an NPDES-regulated entity is required to electronically submit the required NPDES information (as specified in appendix A to 40 C.F.R. part 127) to the appropriate initial recipient, as determined by U.S. EPA, and as defined in 40 C.F.R. section 127.2(b). U.S. EPA will identify and publish the list of initial recipients on its website and in the Federal Register, by state and by NPDES data group [see 40 C.F.R. section 127.2(c)]. U.S. EPA will update and maintain this listing. (40 C.F.R. § 122.41(l)(9).)

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Colorado River Basin Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13268, 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Colorado River Basin Water Board of the following (40 C.F.R. § 122.42(b)):

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants (40 C.F.R. § 122.42(b)(1));
2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order (40 C.F.R. § 122.42(b)(2)); and
3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 C.F.R. § 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

Section 308 of the federal Clean Water Act (CWA) and sections 122.41(h), (j)-(l), 122.44(i), and 122.48 of title 40 of the Code of Federal Regulations (40 C.F.R.) require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Colorado River Basin Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. This MRP establishes monitoring, reporting, and recordkeeping requirements that implement the federal and California laws and/or regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the Colorado River Basin Water Board.

B. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes.

C. All flow measurement devices shall be calibrated at least once per year or more frequently, to ensure continued accuracy of the devices.

D. Laboratories analyzing monitoring samples shall be certified by the State Water Board, in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.

E. The collection, preservation and holding times of all samples shall be in accordance with the test procedures under 40 C.F.R. part 136 (amended May 18, 2012) "*Guidelines Establishing Test Procedures for the Analysis of Pollutants*," promulgated by the United States Environmental Protection Agency (U.S. EPA), unless otherwise specified in this MRP. In addition, the Colorado River Basin Water Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 C.F.R part 136.

F. The Discharger must utilize analytical methods as follows:

1. A test procedure listed in 40 C.F.R. section 136.3; or
2. An alternative test procedure approved by EPA as provided in 40 C.F.R. sections 136.4 or 136.5; or;
3. A test procedure listed in 40 C.F.R. part 136, with modifications allowed by EPA as provided in 40 C.F.R. section 136.6.

Guidance on procedures for approval of alternative and new test procedures can be obtained from the following references: *Protocol for EPA Approval of Alternative Test Procedures for Organic and Inorganic Analytes in Wastewater and Drinking Water* (EPA 821-B-98-002, March 1999); *and Protocol for EPA Approval of New Methods for Organic and Inorganic Analytes in Wastewater and Drinking Water* (EPA 821-B-98-003, March 1999).

G. For priority pollutants, the Discharger shall require its testing laboratory to calibrate the analytical system down to the minimum levels (MLs) specified in 40 C.F.R. part 136, unless an alternative minimum level is approved by the Colorado River Basin Water Board's Executive Officer.

H. In conformance with federal regulations 40 C.F.R. section 122.45(c), analyses to determine compliance with the effluent limitations for metals shall be conducted using the total recoverable method. For Chromium (VI), the dissolved method in conformance with 40 C.F.R. part 136 shall be used to measure compliance with a Chromium (VI) effluent limitation.

For Cyanide[1], analytical test methods in conformance with 40 C.F.R. part 136 shall be used as acceptable methods to measure Cyanide[2].

I. In accordance with the test procedures under 40 C.F.R. part 136, samples shall be analyzed as soon as possible after collection. The Discharger shall develop and implement a written Quality Assurance Plan (QAP) for samples that are analyzed on-site. The QAP shall at a minimum address the following steps:

1. Provide a description of Standard Operating Procedures (SOPs);
2. Provide an overview of the task description and objectives;
3. Identify the sampling process, method and handling;
4. Identify the instrumentation/equipment testing, inspection and maintenance;
5. Identify the instrumentation/equipment calibration and frequency;
6. Identify the sample analysis methods and calibration range; and
7. Summarize the data review and validation procedures.

J. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. In the event that continuous monitoring equipment is out of service for period greater than 24-hours, the Discharger shall obtain representative grab samples each day the equipment is out of service. The Discharger shall correct the cause(s) of failure of the continuous monitoring equipment as soon as practicable. The Discharger shall report the period(s) during which the equipment was out of service and if the problem has not been corrected, shall identify the steps which the Discharger is taking or proposes to take to bring the equipment back into service and the schedule for these actions.

K. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

L. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.

M. If the Facility is not in operation, or there is no discharge during a required reporting period, the Discharger shall indicate that there has been no activity during the required reporting period in CIWQS.

N. The Discharger shall submit values in eSMR as required to determine compliance with the permit effluent limit requirements (e.g., AMEL, MDEL, % removals, geomeans, mass loadings, etc.) in the California Integrated Water Quality System (CIWQS) Program.

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1 The sample for cyanide measurement shall be collected as a grab sample. Various sample preservation and sample stabilizations procedures are available that may resolve analytical interferences associated with cyanide analysis of treated wastewater effluent, ASTM Standard Practice D7365-09a. Furthermore, any technique for removal or suppression of interferences may be employed, provided the laboratory demonstrates that it more accurately measures cyanide through quality control measures described in the analytical test method. Any removal or suppression technique not described in D7365-09a or the analytical test method must be documented with supporting data.

2 Federal Register, Vol. 77, No. 97, May 18, 2012. Cyanide exists in a variety of forms. It can be free or part of strong or weak complexes with other species. The analytical method employed determines what type of cyanide is measured. Types of cyanide measured include: Total, Available, Amenable to Chlorination, Weak Acid Dissociable, Free and others.

O. The Discharger shall submit the eSMR for reporting period November 2017 in the eSMR module for Order No. R7-2012-0011 in the CIWQS Program.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location[1] Name	Monitoring Location Description
--	INF-001	Wastewater influent to the treatment Facility. The sampling station shall be located upstream of any in-plant return flows where a representative influent sample to the treatment plant can be obtained.
001	EFF-001	Effluent discharged from the treatment facility into the unnamed tributary to the New River; Latitude 32°47' 45.9" N and Longitude 115° 42' 0.2" W.
---	RSW-001	Receiving water (New River) monitoring location not to exceed 100 feet upstream from the location where the effluent enters the New River; Latitude 32°47' 39.92" N and Longitude 115° 42' 8.69" W.
---	RSW-002	Receiving water (New River) monitoring location not to exceed 200 feet downstream from the location where the effluent enters the New River, at a point where a plume would be expected; Latitude 32°48' 7.3" N and Longitude 115° 42' 21.47" W.

[1] The North latitude and West longitude information in Table 1 are approximate for administrative purposes.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. The Discharger shall monitor influent at INF-001 as follows:

Table E-2. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Metered[1]	Continuous	See Section I.B of the MRP
Biochemical Oxygen Demand (BOD_5) (5 day @ 20 Deg. C)	mg/L	24-Hr. Composite	1x/Week	See Section I.E. of the MRP
	lbs/day	Calculated		
Suspended Solids, Total (TSS)	mg/L	24-Hr. Composite	1x/Week	"
	lbs/day	Calculated		

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor equivalent to secondary treated wastewater effluent at Monitoring Location EFF-001 as follows:

Table E-3. Effluent Monitoring at EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Flow Meter (Totalizer)	1x/Day[1]	See Section I.B of the MRP

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
		Reading/Calculation		
pH	Standard Units	Grab	1x/Week	See Section I.E and I.F of the MRP
Temperature	°F	Grab	1x/Week	"
20°C BOD_5	mg/L	24-Hr. Composite[2]	1x/Week	See Section I.E. of the MRP
	lbs/day	Calculated		
TSS	mg/L	24-Hr. Composite	1x/Week	"
	lbs/day	Calculated		
Escherichia coli (*E. coli*)	MPN/100 ml	Grab	5x/Month[3]	[4]
Enterococci	MPN/100 ml	Grab	5x/Month[3]	See Section I.E and I.F of the MRP
Fecal coliform	MPN/100 ml	Grab	5x/Month[3]	"
Dissolved oxygen	mg/L	Grab	1x/Month	"
Copper, Total Recoverable	µg/L	Grab	1x/Month	See Section I.G. of the MRP
	lbs/day	Calculated		
Mercury, Total Recoverable	µg/L	Grab	1x/Month	"
	lbs/day	Calculated		
Cyanide, Free	µg/L	Grab	1x/Month	"
	lbs/day	Calculated		
Bis (2-ehtylhexyl) Phthalate	µg/L	Grab	1x/Month	"
	lbs/day	Calculated		
Dissolved Solids, Total	mg/L	Grab	1x/Quarter	See Section I.E and I.F of the MRP
Nitrates, as N	mg/L	Grab	1x/Quarter	"
Nitrites, as N	mg/L	Grab	1x/Quarter	"
Total Nitrogen, as N	mg/L	Grab	1x/Quarter	"
Total Ammonia, as N	mg/l	Grab	1x/Quarter	"
Total Phosphate, as P	mg/L	Grab	1x/Quarter	"
Ortho-Phosphate, as P	mg/L	Grab	1x/Quarter	"
Hardness, Total (as CaCO3)	mg/L	Grab	1x/Quarter	"
Oil and Grease[5]	mg/L	Grab	1x/Year	"
	lbs/day	Calculated		
Priority Pollutants[6]	µg/L	Grab/24-Hr. Composite[7]	1x/Year	See Section I.G of the MRP

1 Report total daily flow. The Discharger calculates the daily effluent flow from daily readings taken from the effluent flow totalizer.

2 24-hour composite samples shall be flow-proportionate composite samples.

3 Five samples equally spaced over a 30-day period with a minimum of one sample per week.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method

[4] The Discharger may monitor for *E. coli* using analytical methods, Standard Method 9221.F or 9223 (APHA. 1998, 1995, 1992. Standard Methods for the Examination of Water and Wastewater. American Public Health Association, 20th, 19th, and 18th Editions. Amer. Publ. Hlth. Assoc., Washington D.C.)

[5] Total oil and grease shall include the polar and non-polar fraction of oil and grease materials.

[6] All Priority Pollutants as defined by the California Toxics Rule (CTR), codified at 40 C.F.R. section 131.38.

[7] 24-hour composite samples shall be time-proportionate composite samples. Inorganic priority pollutant shall be collected using composite samples and volatile and semi-volatile pollutants shall be collected using grab samples.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Chronic Toxicity Testing

1. **Discharge In-stream Waste Concentration (IWC) for Chronic Toxicity.** The chronic toxicity IWC for this discharge is 100 percent effluent.

2. **Sample Volume and Holding Time.** The total sample volume shall be determined by the specific toxicity test method used. Sufficient sample volume shall be collected to perform the required toxicity test. All toxicity tests shall be conducted as soon as possible following sample collection. No more than 36 hours shall elapse before the conclusion of sample collection and test initiation.

3. **Test Methods.** The Discharger shall conduct the following chronic toxicity tests on effluent samples at the in-stream waste concentration for the discharge in accordance with species and test protocols in EPA/821-R-02-013 – *Short Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms*, 4th edition.

4. **Chronic Freshwater Species.** The Discharger shall conduct static renewal toxicity tests, with the fathead minnow (*Pimephales promelas*), (Larval Survival and Growth Test Method 1000.0) and the water flea (*Ceriodaphnia dubia*), (Survival and Reproduction Test Method 1002.0); and static tests with the green alga (*Selenastrum capricornutum*), (Growth Test Method 1003.0). In no case shall these species be substituted with another test species unless written authorization from the Colorado River Basin Water Board is received.

5. **Discharge Collected at Monitoring Stations.** The Discharger shall conduct chronic toxicity testing on the final effluent measured at Monitoring Location EFF-001 as follows:

Table E-4. Whole Effluent Toxicity Test Species

Test (s)	Species	Endpoints	Test Duration (days)	References	Sample Type	Minimum Sampling Frequency [4]
Chronic	Fathead Minnow (*Pimephales promelas*)[1]	Larval Survival and Growth	7	EPA 821-R-02-013 (Chronic) EPA Method 1000.0	24-Hr. Composite	4x/Year [2]
Chronic	Water Flea (*Ceriodaphnia dubia*)[1]	Survival and Reproduction	6-8[3]	EPA 821-R-02-013 (Chronic) EPA Method 1002.0	24-Hr. Composite	4x/Year [2]
Chronic	Green Alga (*Selenastrum capricomutum*)[1]	Growth	4	EPA 821-R-02-013 (Chronic) EPA Method 1003.0	24-Hr. Composite	4x/Year [2]

1 For the fathead minnow and the water flea, the sample should consist of three water samples collected on three separate days as noted in the method. The green algae test uses only one sample, as it is a shorter test.

2 The screening phase (conducted during the first and fourth years of the permit term) shall be completed after a minimum of one (1) toxicity test has been completed on the three test species. The monitoring phase shall be conducted after the initial screening and during the remaining years (i.e., second, third, and fifth years of the permit term), using the most sensitive species.

3 Test duration is determined by production of 3rd brood by control and can be between 6 and 8 days.

4 The reporting period will match the sampling frequency (e.g., minimum sampling frequency is monthly then the reporting period is monthly, minimum sampling frequency is quarterly then reporting period is quarterly, etc.)

6. **Species Sensitivity Screening.** During the first and fourth years of the permit term, the toxicity testing shall be conducted in two phases, the screening phase and the monitoring phase.

   a. For the screening phase, the Discharger shall split a 24-hour composite effluent sample and conduct concurrent toxicity tests using a fish, an invertebrate and an aquatic plant species. The fathead minnow (*Pimephales promelas*), water flea (*Ceriodaphnia dubia*), and green alga (*Selenastrum capricornutum*) are the test species approved by the Colorado River Basin Water Board's Executive Officer.

   b. The screening phase is completed by selecting the most sensitive species. The most sensitive species is the fish, invertebrate, or algal species which consistently demonstrates the largest percent effect level at the In-stream Waste Concentration[3] (IWC), where: IWC percent effect level = [(Control mean response − IWC mean response) ÷ Control mean response] × 100.

   c. After the screening phase, the permittee shall than continue to conduct toxicity testing during the monitoring phase using the single, most sensitive species until the next screening phase. An example of a sensitivity comparison is shown in Table E-5.

Table E-5. Example of Screening Table for Chronic Test

Species	Endpoints	Mean Control Response	Mean Response at IWC (100% effluent)	% effect at IWC (100% effluent)	Most Sensitive Species
Fathead Minnow	Larval Survival	10	10	(10 - 10)/10 x 100 = 0%	
Fathead Minnow	Growth	0.41	0.363	(0.41-0.363)/.41 x 100 =11.5%	
Water Flea	Survival	10	9	(10-9)/10 x 100 = 10%	
Water Flea [1]	Reproduction	33.4	26.7	(33.4-26.7)/33.4 x 100 =20%	Highest % effect represents most sensitive species [1]
Green Alga	Growth	197.3	170.1	(197.3-170.1)/197.3 x 100 =13.8%	

1 In this example, the water flea represents the most sensitive species. Chronic tests for the water flea shall be conducted as required by measuring and reporting the endpoints for survival and reproduction during the monitoring phase at 100 percent IWC effluent.

3 Mixing zones or dilution credits are not authorized for this discharger and 100% effluent will be considered the IWC.

7. **Quality Assurance and additional Requirements.** Quality assurance measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements are below.

   a. The discharge is subject to determination of "Pass" or "Fail" from a chronic toxicity test using the Test of Significant Toxicity (TST) statistical t-test approach described in National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document (EPA 833-R-10-003, 2010), Appendix A, Figure A-1 and Table A-1 (Chronic Freshwater and East Coast Methods) and Appendix B, Table B-1.

   b. The null hypothesis (Ho) for the TST statistical approach is:

      Mean discharge IWC response ≤ 0.75 x Mean control response.

      A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail".

   c. The relative "Percent Effect" at the discharge IWC is defined and reported as:

      Percent Effect = ((Mean control response – Mean discharge IWC response) / Mean control response) x 100

      This is a t-test (formally Student's t-Test), a statistical analysis comparing two sets of replicate observations, i.e., a control and IWC. The purpose of this statistical test is to determine if the means of the two sets of observations are different (i.e., if the IWC or receiving water concentration differs from the control (the test result is "Pass" or "Fail")). The Welch's t-test employed by the TST statistical approach is an adaptation of Student's t-test and is used with two samples having unequal variances.

   d. If the effluent toxicity test does not meet all test acceptability criteria (TAC) specified in the referenced test method in EPA/821-R-02-013 (see Table E-6), then the Discharger must resample and re-test within 14 days.

Table E-6. TAC Specified in EPA/821-R-02-013

Species and EndPoints	EPA/821-R-02-013 Test Method	Test Acceptability Criteria (TAC)
Fathead Minnow *Larval Survival and Growth*	1000.0, Table 1	80% or greater survival in controls; average dry weight per surviving organism in control chambers equals or exceeds 0.25 mg. (required)
Water Flea *Survival and Reproduction*	1000.2, Table 3	80% or greater survival of all control organisms and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control females must produce three broods.(required)
Green Algae *Growth*	1000.3, Table 3	Mean cell density of at least 1 X 106 cells/mL in the controls; and variability (CV%) among control replicates less than or equal to 20%. (required)

   e. Dilution water and control water shall be laboratory water prepared and used as specified in the test methods manual. If dilution water and control water is different

from test organism culture water, then a second control using culture water shall also be used.

f. The Discharger shall perform toxicity tests on final effluent samples. Chlorine in the final effluent sample may be removed prior to conducting toxicity tests in order to simulate the dechlorination process at the Facility. However, ammonia shall not be removed from the effluent sample prior to toxicity testing, unless explicitly authorized by the Executive Officer.

g. A pH drift during a toxicity test may contribute to artifact toxicity when pH-dependent toxicants (e.g., ammonia, metals) are present in the effluent. To determine whether or not pH drift is contributing to artifact toxicity, the Discharger shall conduct side-by-side toxicity tests as described in Section 11.3.6.1 of Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013, 2002).

   Toxicity is confirmed to be an artifact and due to pH drift when no toxicity above the chronic WET permit limit or trigger is observed in the treatments controlled at the pH of the effluent. Upon this confirmation, the Discharger shall request and, upon written approval by the Colorado River Basin Water Board's Executive Officer, the permittee may use the procedures outlined in Section 11.3.6.2 of the chronic freshwater test methods manual to control effluent sample pH during the toxicity test.

8. **Preparation of an Initial Investigation TRE Work Plan.** The Discharger shall review and update the existing TRE work plan to the Colorado River Basin Water Board for approval within 90 days of the effective date of this permit. If the Executive Officer does not disapprove the work plan within 60 days, the work plan shall become effective. The Discharger shall use USEPA manual EPA/833B-99/002 (municipal) as guidance, or most current version. This work plan shall describe the steps that the Discharger intends to follow if toxicity is detected. At minimum, the work plan shall include:

   a. A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency.

   b. A description of the Facility's methods of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in the operation of the Facility; and,

   c. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of the person who would conduct the TIEs (i.e., an in-house expert or an outside contractor).

9. **Accelerated Monitoring Schedule.** The Discharger shall initiate a TRE to address effluent toxicity if any WET testing results are reported as "Fail" during accelerated monitoring.

   a. **Source of Toxicity is Known**

      If the chronic WET testing results are reported as "Fail" and the source of toxicity is known [e.g., a temporary plant upset, ammonia, ionic imbalance or elevated total dissolved solids (TDS)], then the Discharger shall conduct one additional toxicity test. The Discharger shall use the same species and test method that failed the WET test. This toxicity test shall begin within 14 days of receipt of a test result as "Fail". If the additional toxicity test result is reported as "Pass" or it is confirmed that the toxicity is due to temporary plant upset, ammonia, ionic imbalance or elevated TDS, then the Discharger may return to the regular testing frequency.

b. **Source of Toxicity is Not Known**

If the chronic WET testing results are reported as "Fail" and the source of toxicity is not known, then the Discharger shall conduct four additional toxicity tests using the same species and test method, approximately every two weeks, over an eight-week period. This testing shall begin within 14 days of receipt of a test result as "Fail." If none of the additional toxicity tests results are "Fail", then the Discharger may return to the regular testing frequency.

c. When the WET testing results are reported as "Fail" during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications.

i. During accelerated monitoring schedules, only TST results ("Pass" or "Fail", "Percent Effect") for chronic toxicity tests shall be reported as effluent compliance monitoring results for the chronic toxicity.

ii. If the results of four consecutive accelerated monitoring tests result in "Pass", the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

iii. If the source(s) of the toxicity is easily identified (e.g., temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four consecutive accelerated tests result in "Pass." Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

iv. If the result of any accelerated toxicity test results in "Fail", the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity.

10. **TRE Process.** If the discharge results in "Fail" during accelerated toxicity monitoring established in this Provision, the Discharger is required to initiate a TRE in accordance with an approved TRE Work Plan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity and, within 15 days, submit to the Colorado River Basin Water Board a Detailed TRE Work Plan, which shall follow the TRE Work Plan revised as appropriate for this toxicity event.

a. **Preparation and Implementation of Detailed TRE Work Plan.** The Discharger shall immediately initiate a TRE developed in accordance with U.S. EPA guidance provided in manuals EPA/600/2-88/070 (industrial) or EPA/833B-99/002 (municipal) and, within 15 days, submit to the Colorado River Basin Water Board a Detailed TRE Work Plan, which shall follow the TRE Work Plan revised as appropriate for this toxicity event. It shall include the following information, and comply with additional conditions set by the Executive Officer:

i. Further actions by the Discharger to investigate, identify, and correct the causes of toxicity.

ii. Actions the Discharger will take to mitigate the effects of the discharge and prevent the recurrence of toxicity.

iii. A schedule for these actions, progress reports, and the final report.

b. **Toxicity Investigation Evaluation (TIE) Implementation.** As part of a TRE to identify the causes of toxicity the Discharger shall identify the causes of toxicity using the same species and test methods and, as guidance, use the procedures recommended by the U.S. EPA which include the following:

i. *Toxicity Identification Evaluations: Characterization of Chronically Toxic Effluents, Phase I* (EPA/600/6-91/005F, 1992);

ii. *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991);

iii. *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); and

iv. *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993.

c. **Ammonia, Ionic Imbalances or Elevated TDS Toxicity.**

i. For discharges where ammonia has been identified as a cause of toxicity, the Discharger shall calculate the response threshold on the basis of unionized and total ammonia. The Discharger shall run a parallel test with ammonia in lab water to evaluate if the lab water and the effluent responses are the same (i.e., no matrix effect). In future WET testing, where ammonia toxicity is hypothesized as the cause, the Discharger has the following three options to evaluate whether ammonia is causing the toxicity.

(a) If toxicity in lab water is similar to that in the effluent, the Discharger shall conduct a parallel test with ammonia spiked into lab water. Toxicity endpoints are compared on the basis of unionized ammonia. If the endpoints are the same, then the implication is ammonia is responsible for toxicity and no further action is required; or

(b) If toxicity in lab water is not similar to that in the effluent, the Discharger shall conduct a parallel test with effluent, maintaining pH at a level that maintains the unionized fraction below the toxic threshold. If no toxicity is observed in the pH controlled sample, then implication is that ammonia is responsible for toxicity and no further action is required; or

(c) Without using comparative tests, calculate toxicity in the sample on the basis of unionized ammonia and compare the result to data generated in the TIE; if the results support the hypothesis that ammonia explains toxicity, then no further action is required.

(d) However, if ammonia is not identified as the toxicant, the Discharger shall take action as described in Section V.A.9. Accelerated Monitoring Schedule of this MRP.

ii. For discharges where ionic imbalance or elevated TDS has been identified as a cause of toxicity, the Discharger shall conduct the following concurrent tests to characterize the contribution of ionic imbalance or elevated TDS to effluent toxicity. Based on the test results, toxicity should be either quantitatively recovered in synthetic effluent that mimics ionic imbalance or elevated TDS, or eliminated by adding selected ions to the effluent to address deficiencies. Thus, in future WET testing, where ionic imbalance or elevated TDS is hypothesized as contributing to toxicity, the Discharger has the following two

options to evaluate whether ionic imbalance or elevated TDS is causing the toxicity.

(a) Conducting a parallel test with synthetic effluent that mimics the ionic imbalance or TDS concentration; or

(b) Conducting a parallel test with effluent spiked with deficient ion(s).

Using these approaches, if ionic imbalance or elevated TDS is shown to account for toxicity, the Discharger shall document the results and findings in the monitoring report and no further testing is required. However, if the parallel tests do not account for toxicity, the Discharger shall take action as described in Section V.A.9. Accelerated Monitoring Schedule of this MRP.

11. **Reporting of Toxicity Monitoring Results.** The Discharger shall submit either a summary page or the full laboratory report for all toxicity testing as an attachment to CIWQS for the reporting period (e.g., monthly, quarterly, semi-annually or annually) and provide the data (i.e., Pass/Fail, Percent Effect) in the PET tool for uploading into CIWQS. The laboratory report shall include:

    a. The valid toxicity test results for the TST statistical approach, reported as "Pass" or "Fail" and "Percent Effect" at the toxicity IWC for the discharge, the dates of sample collection and initiation of each toxicity test, all results for effluent parameters monitored concurrently with the toxicity test(s); and progress reports on TRE investigations.

    b. The statistical analysis used in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010) Appendix A, Figure A-1 and Table A-1, and Appendix B, Table B-1.

    c. Statistical program (e.g., TST calculator, CETIS, etc.) output results, including graphical plots, for each toxicity test.

    d. TRE/TIE results. The Colorado River Basin Water Board shall be notified no later than 30 days from completion of each aspect of TRE/TIE analyses. Prior to the completion of the final TIE/TRE report, the Discharger shall provide status updates in the monthly monitoring reports, indicating which TIE/TRE steps are underway and which steps have been completed.

    e. Any additional QA/QC documentation or any additional chronic toxicity-related information, upon written request from the Colorado River Basin Water Board.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECYCLING MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS

A. Monitoring Location RSW-001

1. The Discharger shall monitor the New River at Monitoring Location RSW-001 as follows. In the event that no receiving water is present at Monitoring Location RSW-001, no receiving water monitoring data are required for Monitoring Location RSW-001.

Table E-7. Receiving Water Monitoring Requirements – RSW-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
pH	Standard Units	Grab	1x/Quarter	See Section I.E of the MRP
Temperature	°F	Grab	1x/Quarter	"

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1x/Quarter	"
Total Dissolved Solids	mg/L	Grab	1x/Quarter	"
Total Hardness (as $CaCO_3$	mg/L	Grab	1x/Quarter	"
Nitrates, as N	mg/L	Grab	1x/Quarter	"
Nitrites, as N	mg/L	Grab	1x/Quarter	"
Total Ammonia, as N	mg/L	Grab	1x/Quarter	"
Total Nitrogen, as N	mg/L	Grab	1x/Quarter	"
Total Phosphate, as P	mg/L	Grab	1x/Quarter	"
Ortho-Phosphate, as P	mg/L	Grab	1x/Quarter	"
Priority Pollutants[1]	µg/L	Grab	1x/Year	See Section I.F of the MRP

[1] All Priority Pollutants as defined by the California Toxics Rule (CTR), codified at 40 C.F.R. section 131.38.

B. Monitoring Location RSW-002

1. The Discharger shall monitor the New River at Monitoring Location RSW-002 as follows. In the event that no receiving water is present at Monitoring Location RSW-002, no receiving water monitoring data are required for Monitoring Location RSW-002.

Table E-8. Receiving Water Monitoring Requirements- RSW-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
pH	Standard Units	Grab	1x/Quarter	See Section I.E of the MRP
Temperature	°F	Grab	1x/Quarter	"
Dissolved Oxygen	mg/L	Grab	1x/Quarter	"
Total Dissolved Solids	mg/L	Grab	1x/Quarter	"
Nitrates, as N	mg/L	Grab	1x/Quarter	"
Nitrites, as N	mg/L	Grab	1x/Quarter	"
Total Ammonia, as N	mg/L	Grab	1x/Quarter	"
Total Nitrogen as N	mg/L	Grab	1x/Quarter	"
Total Phosphate, as P	mg/L	Grab	1x/Quarter	"
Ortho-Phosphate, as P	mg/L	Grab	1x/Quarter	"

C. Visual Monitoring

1. In conducting the receiving water sampling, a log shall be kept of the receiving water conditions at Monitoring Locations RSW-001 and RSW-002. Notes on receiving water conditions shall be summarized in the monthly monitoring report and when data are submitted electronically via the SMR module in the CIWQS Program, data shall be reported in the "Attachments" section. Attention shall be given to the presence or absence of:

   a. Floating or suspended matter;

   b. Discoloration;

   c. Aquatic life (including plants, fish, shellfish, birds);

d. Visible film, sheen, or coating;

e. Fungi, slime, or objectionable growths; and

f. Potential nuisance conditions.

IX. OTHER MONITORING REQUIREMENTS

A. Pretreatment Monitoring

In the event that significant industrial wastewater is being discharged to the wastewater treatment facility, then the Discharger shall provide the Colorado River Basin Water Board with an annual report describing the pretreatment program activities over the previous twelve (12)-month period and it shall include:

1. A summary of actions taken by the Discharger which ensures industrial-user compliance;
2. An updated list of industrial users (by SIC categories) which were issued permits, and/or enforcement orders; and
3. The name and address of each user that received a revised discharge limit.

In the event that an approved pretreatment program is required, the discharge shall submit a pretreatment program submittal to obtain pretreatment approval.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

1. The Discharger shall report the results of chronic toxicity testing, TRE, as required in section V, "Effluent Toxicity Testing".
2. The results of any analysis taken more frequently than required using analytical methods, monitoring procedures and performed at the locations specified in this MRP shall be reported to the Colorado River Basin Water Board.
3. The Discharger shall ensure laboratory analytical results are consistent with the requirements contained in 40 C.F.R. part 136 with regard to significant figures. 40 C.F.R. part 136 specifies for some analytical methods, the number of significant figures to which measurements are made.

B. Electronic Self-Monitoring Reports (eSMRs)

1. The Discharger shall electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program website (http://www.waterboards.ca.gov/ciwqs/index.html). The CIWQS website will provide additional information for eSMR submittal in the event there will be a planned service interruption for electronic submittal.
2. The Discharger shall maintain sufficient staffing and resources to ensure it submits eSMRs for the duration of the term of this permit including any administrative extensions. This includes provision of training and supervision of individuals (e.g., Discharger personnel or consultant) on how to prepare and submit eSMRs.
3. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly, quarterly, and annual eSMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this Order. SMRs are to include all new monitoring results obtained since the last eSMR was submitted. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this

monitoring shall be included in the calculations and reporting of the data submitted in the eSMR.

4. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-9. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	December 1, 2017	All	Submit with monthly eSMR
Daily 1x/Day	December 1, 2017	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly eSMR
Weekly 1x/Week	December 1, 2017	Sunday through Saturday	Submit with monthly eSMR
5x/Month	December 1, 2017	Sunday through Saturday	Submit with monthly eSMR
Monthly 1x/Month	December 1, 2017	1st day of calendar month through last day of calendar month	First day of second month from end of monitoring period
Quarterly 1x/Quarter 4x/Year	December 1, 2017	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	May 1 August 1 November 1 February 1
Annually 1x/Year	December 1, 2017	January 1 through December 31	March 1

5. **Reporting Protocols.** The Discharger shall follow the procedure in 40 C.F.R. part 136 when reporting the results of analytical determinations of chemical constituents in a sample. Further, the Discharger shall use the following reporting protocol:

   a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample). For reporting concentration and calculated values in the PET tool follow these instructions:

      i. Reporting Concentration - Under the "Qualifier" column select "=" and under the "Result" column report the result (concentration).

      ii. Reporting Calculated Values - Under the "Qualifier" column select "=" and under the "Result" column report the result (calculated value).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported under the "Qualifier" column as "DNQ" (Detected, but Not Quantified). For the purposes of data collection, the laboratory shall write the estimated chemical concentration under the "Result" column next to DNQ. The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory. For reporting concentration and calculated values in the PET tool follow these instructions:

      i. Reporting Concentration – Under the "Qualifier" column select "DNQ", under the "Result" column report the estimated chemical concentration. In addition,

the MDL shall be reported under the "MDL" column and the ML shall be reported under the "ML" column.

ii. Reporting Calculated Values – Under the "Qualifier" column select "<", under the "Result" column report the calculated value or in the case of mass loading report the average monthly effluent limitation for mass loading.

c. Sample results less than the laboratory's MDL shall be reported as "ND" (Not Detected). For reporting concentration and calculated values in the PET tool follow these instructions:

i. Reporting Concentration – Under the "Qualifier" column select "ND" and report the MDL under the "MDL" column.

ii. Reporting Calculated Values - Under the "Qualifier" column select "<", under the "Result" column report the calculated value (Flow, MGD x 8.34 x MDL (use correct units)) or in the case of mass loading report the average monthly effluent limitation for mass loading.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

6. **Multiple Sample Data**: If the Permit contains an AMEL, AWEL and MDEL for pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

7. The Discharger shall submit eSMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the eSMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation. In addition, the Discharger shall add these violations into CIWQS.

c. The Discharger shall upload the Whole Effluent Toxicity Test result page or entire report for the reporting period under the attachment tab for the reporting period.

d. The Discharger shall upload the laboratory reports for the analysis of the priority pollutant for the reporting period under the attachment tab for the reporting period. The Discharger shall evaluate the results with the criteria and notify the Colorado River Basin Regional Board of any exceedance of the criteria.

C. Discharge Monitoring Reports (DMRs)

1. DMRs are U.S. EPA reporting requirements. The Discharger shall electronically certify and submit DMRs together with SMRs using Electronic Self-Monitoring Reports module eSMR 2.5 or any upgraded version. Electronic DMR submittal shall be in addition to electronic SMR submittal. Information about electronic DMR submittal is available at the DMR website at: http://www.waterboards.ca.gov/water_issues/programs/discharge_monitoring.

D. Other Reports

1. The Discharger shall report the results of any special studies required by Special Provisions – VI.C.2 of this Order. The Discharger shall report the progress in satisfaction of compliance schedule dates specified in Special Provisions – VI.C.7 of this Order.

2. The Discharger shall submit reports with the eSMR scheduled to be submitted on or immediately following the report due date.

3. **Operations and Maintenance Report**. The Discharger shall report the following as shown in Table E-10:

Table E-10. Operations and Maintenance Report

Activity	Reporting Frequency
To inspect and document the operation and maintenance of the UV disinfection system, including but not limited to, inspection, cleaning, and bulb replacement. The Discharger shall provide a certification statement in the annual report that inspections and documentation of inspections and operations/maintenance problems have been completed.	1x/ Year
To inspect and document any operation/maintenance problems by inspecting each unit process. The Discharger shall provide a certification statement in the annual report that inspections and documentation of inspections and operations/maintenance problems have been completed.	1x/Year
Calibration of flow meters and mechanical equipment shall be performed in a timely manner and documented. The Discharger shall provide a certification statement in the annual report that the calibration of flow meters and mechanical equipment has been conducted and documentation of such calibrations is maintained.	1x/Year
The Discharger shall maintain documentation of all logbooks (operation and maintenance), chain of custody sheets, laboratory and sampling activities as stated in Standard Provisions sections IV and V (Attachment D). The Discharger shall provide a certification statement in the annual report that maintenance of logbooks, chain of custody sheets, and laboratory and sampling activities as required is being implemented.	1x/Year
The Discharger shall conduct an annual review and evaluation of priority pollutant sampling results collected each year to evaluate the impact on surface water quality, and provide this evaluation in the annual report.	1x/Year

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II.D of this Order, the Colorado River Basin Water Quality Control Board (Colorado River Basin Water Board) incorporates this Fact Sheet as findings of the Colorado River Basin Water Board supporting the issuance of this Order. This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for dischargers in California. Only those sections or subsections of this Order that are specifically identified as "not applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "not applicable" are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	7A 33 0111 013
Discharger	Seeley County Water District
Name of Facility	Seeley County Wastewater Treatment Plant
Facility Address	1898 West Main Street
	Seeley, CA 92273
	Imperial County
Legally Responsible Official	John Kemp, Supervisor/Consultant, (575) 494-4649, jhkconsult@gmail.com
Facility Contact, Title and Phone	John Kemp, Supervisor/Consultant, (575) 494-4649, jhkconsult@gmail.com Aaron Garcia, Maintenance Manager, (760) 332-9059, agarcia@seeleywaterdistrict.com
Authorized Person to Sign and Submit Reports	John Kemp, Supervisor/Consultant, (575) 494-4649, jhkconsult@gmail.com
Mailing Address	P.O. Box 161 Seeley, CA 92273
Billing Address	SAME
Type of Facility	Publicly Owned Treatment Works (POTW)
Major or Minor Facility	Minor
Threat to Water Quality	2
Complexity	B
Pretreatment Program	N
Recycling Requirements	None
Facility Permitted Flow	0.25 million gallons per day (MGD)
Facility Design Flow	0.25 MGD
Watershed	Imperial Hydrologic Unit
Receiving Water	An unnamed tributary to the New River
Receiving Water Type	Agricultural Drain immediately tributary to a Stream/River

A. The Seeley County Water District (hereinafter Discharger) is the owner and operator of the Seeley County Wastewater Treatment Plant (hereinafter Facility), a POTW.

For the purposes of this Order, references to the "Discharger" or "Permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The Facility discharges wastewater to the New River via an unnamed tributary, a water of the United States. The Discharger was previously regulated by Order R7-2012-0011 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0105023 which was adopted on September 20, 2012. The NPDES Permit was scheduled to expire on September 30, 2017, but the permit requirements are extended administratively until the adoption of the renewal of the Permit. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

C. The Discharger filed a report of waste discharge and submitted an application for reissuance of its WDRs and NPDES permit on March 28, 2017. The application was deemed complete on July 17, 2017. A site visit was conducted on January 25, 2017 to observe operations and collect additional data to develop permit limitations and requirements for waste discharge.

II. FACILITY DESCRIPTION

The Discharger owns and operates a wastewater collection, treatment, and disposal system (the Facility) and provides service to a population of approximately 2,100 located in the town of Seeley. The permitted maximum daily flow limitation is equal to the design capacity of the wastewater treatment plant which is 0.25 MGD and is located in the NE ¼ of the NW ¼ of Section 11, T16S, R12E, SBB&M. The discharge consists of disinfected equivalent to secondary treated wastewater.

A. Description of Wastewater Treatment System

The current treatment system consists of flow equalization, grinding, oxidation pond treatments through a Clemson aerated pond system consisting of five ponds with surface aerators, sand filtration, and disinfection using an ultraviolet (UV) disinfection system. The collection system provides conveyance of raw wastewater to the treatment facility. The wastewater collection system contains one lift station at the headworks of the wastewater treatment plant. Following installation of the Clemson process facilities in 2004, one of the original 2.4-acre lagoons was retrofitted to a primary oxidation pond and used as an equalization basin prior to entry into the Clemson system (comprised of ponds, or reaction basins). Wastewater first enters the primary oxidation pond, currently reported to remove approximately 40 percent of the influent BOD_5 and TSS. Flow from the primary oxidation pond then enters Clemson Pond #1.

Each Clemson pond/reaction basin is equipped with a surface aerator. Removal and stabilization of organic matter takes place in the reaction basins, Clemson Ponds #1 and #2, through biological oxidation and reduction reactions that generate biomass. The biomass is then separated by gravity sedimentation in the last 3 ponds, Ponds #3, #4, and #5. The secondary effluent is then filtered by three pressurized granular media filters and disinfected via UV light. Following UV disinfection, the treated effluent is discharged to the New River, via an unnamed tributary. The Facility maintains two UV disinfection units, reserving one unit as a back-up unit.

The Discharger dredged Clemson Ponds #1 and #2 to remove sludge that had built up on the pond floor. The sludge was placed into an empty oxidation pond for solar drying. During the site visit conducted in January, 2017, the Discharger stated that they initiated the Clemson Pond dredging approximately 18 months prior.

Wastewater is discharged from Discharge Point 001 (see table on cover page) to an unnamed tributary to the New River, a water of the United States.

B. Discharge Points and Receiving Waters

Final effluent is discharged through Discharge Point 001 at Latitude 32° 47' 45" North and Longitude 115° 42' 10" West, to an unnamed tributary to the New River.

C. Summary of Historic Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in the existing Order R7-2012-0011 for discharges from Discharge Point 001 (Monitoring Location EFF-001) and representative monitoring data from the term of the previous Order are as follows in Table F-2:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (From October 2012 – March 2017)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Flow	MGD	0.25	--	--	0.1535	--	0.9029
Biochemical Oxygen Demand (BOD) (5 day @ 20 Deg. C)	mg/L	45	65	--	18.4	137.6[1]	--
	lbs/day	94	140	--	17.7	140.9	--
Removal Efficiency for CBOD	%	65	--	--	70.7[2]	--	--
Total Suspended Solids (TSS)	mg/L	48	73	--	35.7	97.6[3]	--
	lbs/day	100	152	--	28.2	113	--
Oil and Grease	mg/L	--	--	25	--	--	221[4]
	lbs/day	--	--	52	--	--	157[5]
pH	--	--	--	6.0 – 9.0[6]	--	--	5.91 – 9.28[7]
Escherichia coli (*E. coli*)	MPN/ 100 mL	126[7]	--	400[8]	206.2[10]	--	2,419.2[10]
Enterococci	MPN/ 100 mL	33[8]	--	100[9]	246.3[10]	--	1,600[10]
Fecal Coliform	MPN/ 100 mL	200[8]	--	400[11]	787.1[10]	--	1,600[10]
Zinc, Total Recoverable	µg/L	163	--	328	190[12]	–	190
	lbs/day	0.34	--	0.68	0.2554[13]	--	0.2554[14]
Free Cyanide	µg/L	4.3	--	8.5	40[15]	–	40
	lbs/day	0.0090	--	0.018	0.0377[16]	--	0.0377[14]
Bis(2-ethylhexyl)Phthalate	µg/L	5.9	--	12	335[17]	--	335[17]
	lbs/day	0.012	--	0.025	0.169[18]	--	0.169[18]
Total Ammonia as N	mg/L	--	--	--	--	--	

Parameter	Units	Effluent Limitation			Monitoring Data (From October 2012 – March 2017)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Nitrates as Nitrogen (N)	mg/L	--	--	--	--	--	
Nitrites as N	mg/L	--	--	--	--	--	
Total Nitrogen	mg/L	--	--	--	--	--	
Total Phosphate as Phosphorus (P)	mg/L	--	--	--	--	--	
Ortho-Phosphate as P	mg/L	--	--	--	--	--	
Total Dissolved Solids (TDS)	mg/L	--	--	[9]	--	--	
Temperature	°F	--	--	--	--	--	
Hardness	mg/L	--	--	--	--	--	
Dissolved Oxygen	mg/L	--	--	--	--	--	
Turbidity	NTU	--	--	--	--	--	
Acute Toxicity	TU_a	[10]			Not Available		
Chronic Toxicity – Survival & Reproduction (*Ceriodaphnia dubia*)	TU_c	[10]			1		
Chronic Toxicity – Growth (*Selenatrum capricornutum)*	TU_c	[10]			4[11]		
Chronic Toxicity – Survival and Growth (*Pimephales promelas*)	TU_c	[10]			1		

Parameter	Units	Effluent Limitation			Monitoring Data (From October 2012 – March 2017)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge

1 This value (February 16, 2017) represents an exceedance of the permit limitation. The Discharger exceeded this effluent limitation nine times during the permit term; reported values greater than the effluent limitation ranged from 70.8–137.6 mg/L (occurred during 2016–2017).
2 This value represents the lowest reported value of the minimum percent removal of BOD.
3 This value (April 18, 2015) represents an exceedance of the permit limitation. The Discharger exceeded this effluent limitation seven times during the permit term; reported values greater than the effluent limitation ranged from 75–97.6 mg/L (occurred during 2015–2016).
4 This value (December 17, 2014) is the only value reported as above method detection limits; the remaining two values reported to CIWQS were reported as non-detect.
5 This value was not reported in CIWQS, but was calculated from effluent discharge concentration and flow reported for the date (December 17, 2014).
6 This range represents the instantaneous minimum and maximum pH limitations, respectively.
7 This range of reported pH values indicates the discharge violated pH effluent limitations. The Discharger reported two values below 6.0 s.u. (5.91 on December 2, 2015 and 5.94 on December 21, 2015) and one value above 9.0 s.u. (July 15, 2015).
8 This effluent limitation is expressed as a geometric (or log) mean, based on a minimum of not less than five samples for any 30-day period.
9 This effluent limitation is expressed as a maximum single sample value.
10 Refer to section II.D for a detailed discussion of compliance with bacteria effluent limitations.
11 No more than ten percent of the total fecal coliform samples collected during any 30-day period shall exceed a MPN of 400 per 100 milliliters.
12 This value (February 13, 2017) represents an exceedance of the permit limitation. This is the only value reported greater than the effluent limitation during the permit term.
13 A review of self-monitoring discharge data in the California Integrated Water Quality System (CIWQS) revealed the Discharger incorrectly calculated mass emission rates for Zinc on seven occasions during 2014–2016. It appears the Discharger calculated mass emission rates using the following equation: concentration (µg/L) * flow (MGD) * 8.34.
14 The Discharger did not report mass emission as a daily discharge value for zinc and cyanide. However, Board Order R7-2012-0011 requires the Discharger to monitor monthly for these parameters. Therefore, the highest average monthly mass emission for these parameters would also represent the highest daily mass emissions.
15 This value represents a violation of the average monthly effluent limitation for free cyanide. The Discharger exceeded this effluent limitation eight times during the permit term; reported values greater than the effluent limitation ranged from 5–40 µg/L (occurred during 2014–2017, with six occurrences during 2016).
16 This value (December 7, 2016) represents an exceedance of the permit limitation. The Discharger exceeded this effluent limitation three times during the permit term; reported values greater than the effluent limitation ranged from 0.009 lbs/day to 0.0216 lbs/day).
17 This value (April 7, 2015) is the maximum value reported as above method detection limits; two other values were reported to CIWQS as above method detection limits (5.9 µg/L on March 24, 2015 and 0.007 µg/L on July 31, 2013). All other monthly monitoring results were reported as non-detect.
18 This value was reported incorrectly in CIWQS; the value originally reported in CIWQS was 169.3 lbs/day. The value presented in the table above (0.169 lbs/day) was calculated from the effluent discharge concentration and flow reported for the date (April 7, 2015). Additional mass emission values were incorrectly reported in CIWQS for free cyanide, due to improper calculations to convert the concentration discharged to a mass emission value (i.e., 6.4 lbs/day on March 24, 2015 and 0.3247 lbs/day on March 1, 2016).

The ROWD described the existing discharge as follows:

Annual Average Effluent Flow – 0.13 MGD
Maximum Daily Effluent Flow – 0.56 MGD
Average Daily Effluent Flow – 0.15 MGD

Table 3 presents the effluent characteristics reported in the ROWD and EPA Form 2A.

Table F-3. Effluent Characteristics

Parameter	Units	Maximum Daily	Average Daily
pH (Minimum)	s.u.	6.15	–
pH (Maximum)	s.u.	6.37	–
Temperature (Winter)	°F	61.9	43.1
Temperature (Summer)	°F	91.4	83.8
BOD_5 (EFF-001)	mg/L	137.62	64.6
TSS (EFF-001)	mg/L	53	32
Fecal Coliform	MPN/100 ml	240	100.6
Ammonia as Nitrogen	mg/L	1.68	1.12
Dissolved Oxygen	mg/L	7.66	6.65
Total Kjeldahl Nitrogen	mg/L	2.8	2.24
Nitrate+Nitrite (as Nitrogen)	mg/L	24.1	9.81
Oil and Grease	mg/L	2.6	1.3
Phosphorus	mg/L	27.1	16.1
Total Dissolved Solids	mg/L	1,210	1,176

D. Past Compliance Summary

The available effluent monitoring data indicate that the Discharger has had several effluent limitation violations for bacterial indicators, bis (2-ethylhexyl) phthalate, TSS, and BOD_5.

A review of the available effluent monitoring data, submitted in the Discharger's Self-Monitoring Reports, reported above effluent limitations is summarized below:

Table F-4. Violations Report Summary- bis(2-ethylhexyl) phthalate, BOD_5 and TSS

Date of Exceedance	Limit Basis	Parameter	Permit Limitations	Reported Value	Units
3/9/2017	Average Weekly	BOD_5	65	70.75	mg/L
3/2/2017	Average Weekly	BOD_5	65	104.85	mg/L
2/16/2017	Average Weekly	BOD_5	65	137.62	mg/L
2/9/2017	Average Weekly	BOD_5	65	76.81	mg/L
1/26/2017	Average Weekly	BOD_5	65	86.92	mg/L
1/19/2017	Average Weekly	BOD_5	65	104.25	mg/L
12/27/2016	Average Weekly	BOD_5	65	112.8	mg/L
12/19/2016	Average Weekly	BOD_5	65	74.4	mg/L
2/16/2016	Average Weekly	BOD_5	65	91	mg/L
2/16/2016	Average Weekly	TSS	73	91	mg/L

Date of Exceedance	Limit Basis	Parameter	Permit Limitations	Reported Value	Units
9/8/2015	Maximum Daily	Bis(2-ethylhexyl)Phthalate	12	335	µg/L
9/8/2015	Average Monthly	Bis(2-ethylhexyl)Phthalate	5.9	335	µg/L
2/16/2016	Average Weekly	TSS	73	91	mg/L
9/2/2015	Average Weekly	TSS	73	84	mg/L
7/27/2015	Average Weekly	TSS	73	76	mg/L
5/23/2015	Average Weekly	TSS	73	80	mg/L
4/30/2015	Average Weekly	TSS	73	75.5	mg/L
4/18/2015	Average Weekly	TSS	73	97.6	mg/L
4/11/2015	Average Weekly	TSS	73	75	mg/L
4/7/2015	Maximum Daily	Bis(2-ethylhexyl)Phthalate	12	335	µg/L
4/7/2015	Average Monthly	Bis(2-ethylhexyl)Phthalate	5.9	335	µg/L

The Discharger has offered corrective actions in response to the effluent limitation violations for TSS and BOD_5; noting that violations occurred because of inadequate detention time in treatment ponds, along with ensuring that wastewater is directed through the entire pond treatment system for full treatment.

Table F-5. Violations Report Summary-Bacterial Indicators

Date of Exceedance	Permit Limitation (MPN/100 ml)	Reported Value (MPN/100 ml)
E. coli		
1/31/2016	126 (Geometric Mean)	206.2
1/5/2016	400 (Maximum)	517.2
11/4/2015	"	2,419.2
Enterococci		
12/31/2016	33 (Geometric Mean)	59.7
2/29/2016	"	162.4
1/31/2016	"	246.3
12/27/2016	100 (Maximum)	240
12/20/2016	"	240
12/19/2016	"	220
2/23/2016	"	240
2/16/2016	"	900
2/9/2016	"	1600
1/26/2016	"	387.3
1/19/2016	"	172.2
1/5/2016	"	1600
11/4/2015	"	1600
12/23/2014	"	220
10/30/2012	"	300
Fecal Coliform		
12/31/2016	200 (Log Mean)	234.3

Date of Exceedance	Permit Limitation (MPN/100 ml)	Reported Value (MPN/100 ml)
1/31/2016	"	787.1
12/27/2016	400 (Maximum)	1600
12/20/2016	"	1600
4/28/2016	"	900
1/26/2016	"	500
1/5/2016	"	1600
11/4/2015	"	1600
12/23/2014	"	500
10/30/2012	"	1600

The Discharger reported that effluent limitation violations for bacterial indicators may be corrected with altering treatment plant operations, including the frequency of filter backwashes, UV system sleeve cleanings, and using copper sulfate in the treatment process.

E. Planned Changes

The Discharger indicated during the permitting site visit conducted January 25, 2017, that there are no planned changes for the facility during the upcoming permit term.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order serves as WDRs pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters.

B. California Environmental Quality Act (CEQA)

This Order serves as both an NPDES permit for discharges subject to the Clean Water Act and as WDRs for discharges subject to the California Water Code. Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of Division 13 of the Public Resources Code. Under section 15301 of Title 14 of the CCRs, the Colorado River Basin Water Board's action in approving those parts of the Order that implement state law are exempt from CEQA as an existing facility with no expansion of use beyond that existing at the time of the lead agency's determination.

C. State and Federal Laws, Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The Water Quality Control Plan for the Colorado River Basin (hereinafter Basin Plan), which was adopted on November 17, 1993, and amended on March 7, 2017, designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan (including amendments adopted by the Colorado River Basin Water Board to date). In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Consistent with this state policy, effluent limitations specified in this Order protect existing and potential beneficial uses of the receiving water, which are described in Table F-6:

Table F-6. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	New River (via an unnamed tributary)	Existing: Fresh Water Replenishment (FRSH); Water Contact Recreation (REC-I)[1]; Non-Contact Water Recreation (REC-II); Warm Freshwater Habitat (WARM); Wildlife Habitat (WILD); and Support of Rare, Threatened, or Endangered Species (RARE)[2]. Potential: Industrial Service Supply (IND)

[1] Although some fishing occurs in the downstream reaches, the presently contaminated water in the river makes it unfit for any recreational use. An advisory has been issued by the Imperial County Health Department warning against the consumption of any fish caught from the river and the river has been posted with advisories against any body contact with the water.

[2] Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Colorado River Basin Water Board; and such substantiation must be provided within a reasonable time frame as approved by the Colorado River Basin Water Board.

2. **Thermal Plan.** The State Water Board adopted the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) on January 7, 1971, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. The Thermal Plan does not apply these objectives to the unnamed tributary to the New River, a slough.

3. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** U.S. EPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain federal water quality criteria for priority pollutants.

4. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the U.S. EPA through the NTR and to the priority pollutant objectives established by the Colorado River Basin Water Board in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria promulgated by the U.S. EPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

5. **Emergency Planning and Community Right to Know Act.** Section 13263.6(a), CWC, requires that "the Colorado River Basin Water Board shall prescribe effluent limitations as part of the WDRs of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRKA) indicate as discharged into the POTW, for which the State Water Board or the Colorado River Basin Water Board has established numeric water quality

objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective."

6. **Storm Water Requirements.** U.S. EPA promulgated Federal Regulations for storm water on November 16, 1990 in 40 C.F.R. parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the storm water program and are obligated to comply with the Federal Regulations.

7. **Endangered Species Act Requirements.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C. §§ 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

8. **Sewage Sludge and Biosolids**. This Order does not authorize any act that results in violation of requirements administered by U.S. EPA to implement 40 C.F.R. Part 503, Standards for the Use or Disposal of Sewage Sludge. These standards regulate the final use or disposal of sewage sludge that is generated during the treatment of domestic sewage in a municipal wastewater treatment facility. The Discharger is responsible for meeting all applicable requirements of 40 C.F.R. Part 503 that are under U.S. EPA's enforcement authority.

9. **Anti-degradation Policy.** Federal regulation 40 C.F.R. section 131.12 requires that the state water quality standards include an anti-degradation policy consistent with the federal policy. The State Water Board established California's anti-degradation policy in State Water Board Resolution 68-16 ("*Statement of Policy with Respect to Maintaining High Quality of Waters in California*"). Resolution 68-16 is deemed to incorporate the federal anti-degradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Colorado River Basin Water Board's Basin Plan implements, and incorporates by reference, both the State and federal anti-degradation policies. The permitted discharge must be consistent with the anti-degradation provision of 40 C.F.R. section 131.12 and State Water Board Resolution 68-16.

10. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

D. Impaired Water Bodies on CWA 303(d) List

The immediate receiving water is the New River (via an unnamed tributary). The 2012 USEPA CWA Section 303(d) list of impaired waters (hereinafter 303(d) List) identifies the New River as impaired by the following chemical constituents: bifenthrin, chlordane, chloride, chlorpyrifos, cypermethrin, dichlorodiphenyltrichloroethane (DDT), diazinon, dieldrin, hexachlorobenzene, indicator bacteria, mercury, naphthalene, nitrogen-ammonia (total ammonia), nutrients, organic enrichment/low dissolved oxygen, polychlorinated biphenyls (PCBs), sediment, selenium, toxaphene, toxicity, and trash.

The New River Dissolved Oxygen TMDL was adopted by the Regional Board on May 20, 2010 (Resolution No. R7-2010-0011), approved by the State Water Resources Control Board on December 6, 2011 (Resolution No. 2011-0061), and approved by the Office of

Administrative Law on March 21, 2012, and by USEPA on November 16, 2012. The New River is also listed as impaired for bacteria and sediment / siltation. USEPA has approved the Regional Water Board's TMDLs for these parameters. These TMDLs establish waste load allocations (WLAs) for fecal coliform, E. coli, enterococci, and sediment. The established effluent limitations for fecal coliform, E. coli, enterococci, and TSS in this Order comply with the WLAs established in the New River TMDLs. A Trash TMDL for the New River has been approved by the Regional Water Board and State Water Board, the Office of Administrative Law, and USEPA. The TMDL essentially establishes a prohibition on the discharge of any trash to the New River by point sources. This Order prohibits discharges of trash to the New River.

In addition, the 303(d) List classifies the Salton Sea as impaired by arsenic, chloride, chlorpyrifos, DDT, enterococcus, low dissolved oxygen, nitrogen-ammonia (total ammonia), nutrients, salinity, and toxicity. Tributaries to the Salton Sea, including the receiving water, may be affected by the development of TMDLs for the Salton Sea.

E. Other Plans, Policies, and Regulations

Federal regulations for storm water discharges require specific categories of facilities, which discharges storm water associated with industrial activity (storm water), to obtain NPDES permits and to implement Best Conventional Pollutant Technology (BCT) and Best Available Technology Economically Achievable (BAT) to reduce or eliminate industrial storm water pollution.

The State Water Board adopted Order 2014-0057-DWQ (General Permit No. CAS000001), specifying WDRs for discharges of storm water associated with industrial activities, excluding construction activities, and requiring submittal of a Notice of Intent by industries to be covered under the Permit. Coverage under the General Permit is required in accordance with I.A.9 of Order 2014-0057-DWQ.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) may be established: (1) using U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) on an indicator parameter for the pollutant of concern; or (3) using a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 C.F.R. section 122.44(d)(1)(vi).

Effluent and receiving water limitations in this Order are based on the federal CWA, Basin Plan, State Water Board's plans and policies, U.S. EPA guidance and regulations, and best practicable waste treatment technology. While developing effluent limitations and receiving water limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used.

1. NPDES Application Forms: California Form 200, U.S. EPA Forms 2A dated March 28, 2017.
2. Code of Federal Regulations – Title 40.

3. Water Quality Control Plan (Colorado River Basin –Region 7) as adopted on November 17, 1993 and amended on March 7, 2017.

4. Colorado River Basin Water Board files related to the Seeley County Water District Wastewater Treatment Plant NPDES permit No. CA0105023.

A. Discharge Prohibitions

Effluent and receiving water limitations in this Order are based on the Federal CWA, Basin Plan, State Water Board's plans and policies, U.S. EPA guidance and regulations, and best practicable waste treatment technology.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing U.S. EPA permit regulations at 40 C.F.R. section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 C.F.R. part 133.

a. **Secondary Treatment Standards**. Regulations promulgated in 40 C.F.R. section 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the U.S. EPA Administrator.

Based on this statutory requirement, U.S. EPA developed secondary treatment regulations, which are specified in 40 C.F.R. part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

b. **Equivalent to Secondary Treatment Standards**.

Background. Following publication of the secondary treatment regulations, legislative history indicates that Congress was concerned that U.S. EPA had not "sanctioned" the use of certain biological treatment techniques that were effective in achieving significant reductions in $CBOD_5$ and TSS for secondary treatment. Therefore, to prevent unnecessary construction of costly new facilities, Congress included language in the 1981 amendment to the Construction Grants statutes [Section 23 of Pub. L. 97-147] that required USEPA to provide allowance for alternative biological treatment technologies such as trickling filters or waste stabilization ponds. In response to this requirement, definition of secondary treatment was modified on September 20, 1984 and June 3, 1985, and published in the revised secondary treatment regulations contained in 40 CFR section 133.105. These regulations allow alternative limitations for facilities using trickling filters and waste stabilization ponds that meet the requirements for "equivalent to secondary treatment." These "equivalent to secondary treatment" limitations allow *up to* 45 mg/L (monthly average) and *up to* 65 mg/L (weekly average) for BOD_5 and *up to* 45 mg/L (monthly average) and *up to* 65 mg/L (weekly average) of TSS.

Alternative State Regulations. POTWs that use waste stabilization ponds, identified in 40 CFR section 133.103, as the principal process for secondary treatment and whose operation and maintenance data indicate that the TSS values specified in the equivalent-to-secondary regulations cannot be achieved, can also qualify to have their minimum levels of effluent quality for TSS adjusted upwards. The Alternative State Requirements (ASR) provision contained in section 133.105(d) allows States the flexibility to set permit limitations above the maximum levels of 45 mg/L (monthly average) and 65 mg/L (weekly average) for TSS from lagoons. However, before ASR limitations for suspended solids can be set, the effluent must meet the $CBOD_5$ limitations as prescribed by section 133.102(a). Presently, the maximum TSS value set by the State of California for lagoon effluent is 95 mg/L. This value corresponds to a 30-day consecutive average or an average over duration of less than 30 days.

Eligibility. In order to be eligible for equivalent-to-secondary limitations, a POTW must meet all of the following criteria [40 C.F.R. § 133.101(g)]:

a) The principal treatment process must be either a trickling filter or waste stabilization pond.

b) The effluent quality consistently achieved, despite proper operations and maintenance, is in excess of 30 mg/L BOD_5 and TSS.

c) Water quality is not adversely affected by the discharge (40 C.F.R. section 133.101(g).).

d) The treatment works as a whole provides significant biological treatment such that a minimum 65 percent reduction in $CBOD_5$ is consistently attained (30-day average).

2. Applicable Technology-Based Effluent Limitations

This facility, through use of the current treatment system (i.e., aeration lagoons) meets the technology-based regulations for the minimum level of effluent quality attainable by equivalent-to-secondary treatment in terms of biochemical oxygen demand (BOD_5), TSS, and pH for the existing treatment system of aeration lagoons. Previous Order R7-2012-0011, established technology-based effluent limits to meet applicable equivalent-to-secondary treatment with ASR for BOD_5 and TSS, removal efficiency for BOD_5, and pH.

Federal regulations at 40 CFR Part 133.105(f) provide that the permitting authority shall require more stringent limitations when adjusting permits if the permitting authority determines, based on an analysis of the past performance of the treatment works, that an existing facility can achieve the secondary treatment limitation levels for BOD_5 and TSS effluent values through proper operation and maintenance of the treatment works. An analysis of all TSS effluent data available (October 2012 through March 2017) resulted in a calculated 95^{th} percentile 30-day average concentration of 43 mg/l and a 7-day average concentration of 64 mg/l (1.5 times 43 mg/l). While this analysis does not support a determination that the facility can consistently meet secondary treatment requirements at this time, the Facility can consistently meet effluent limitations for TSS more stringent than the prior Order. Therefore, the new permit retains the TSS effluent limitations based on equivalent to secondary requirements. However, the new permit updates the TSS effluent limitations based on the analysis of the past performance of the treatment works.

The limit for BOD_5 and pH are retained from the previous Order. The proposed effluent limitations are summarized in Table F-7.

Table F-7. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitation				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	MGD	0.25	--	--	--	--
Biochemical Oxygen Demand (BOD_5) (5 day @ 20 Deg. C)	mg/L	45	65	--	--	--
	lb/day[1]	94	140	--	--	--
BOD_5 % Removal	%	65	--	--	--	--
Suspended Solids, Total (TSS)	mg/L	45	65	--	--	--
	lb/day[1]	94	140	--	--	--
pH	s.u.	--	--	--	6.0	9.0

[1] Mass-based effluent limitations are based upon a maximum flow of 0.25 MGD.

a. **Basis for Limitations:**

Table F-8. Basis for Limitations

Parameters	Basis for Limitations
Flow	The design capacity of the treatment plant is 0.25 MGD.
Biochemical Oxygen Demand (BOD) (5 day @ 20 Deg. C)	Discharges to waters that support aquatic life and are dependent on oxygen. Organic matter in the discharge may consume oxygen as it breaks down.
Total Suspended Solids (TSS)	High levels of suspended solids can adversely impact aquatic habitat. Untreated or improperly treated wastewater can contain high amounts of suspended solids.
pH	Hydrogen Ion (pH) is a measure of Hydrogen Ion concentration in the water. A range specified between 6.0 and 9.0 ensures suitability of biological life. This limitation has been adopted in the Basin Plan of the Region.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

CWA Section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) of 40 C.F.R. requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are

contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Table F-9 summarizes the applicable water quality criteria/objectives for priority pollutants reported in detectable concentrations in the effluent or for which effluent limitations existed in Order R7-2012-0011. The hardness value used to conduct the Reasonable Potential Analysis (RPA) was 400 mg/L, which is used when the minimum hardness value of the receiving water upstream of Discharge Point 001 is greater than 400 mg/L (423 mg/L). These criteria were used in conducting the RPA for this Order.

Table F-9. Applicable Beneficial Uses and Water Quality Criteria and Objectives

CTR No.	Parameter	Most Stringent Criteria	CTR/NTR Water Quality Criteria				
			Freshwater		Saltwater		Human Health for Consumption of:
			Acute	Chronic	Acute	Chronic	Organisms Only
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
6	Copper	30.50	51.68	30.50	N/A		--
7	Lead	18.58	476.82	18.58			Narrative
13	Zinc	387.83	387.83	387.83			--
14	Cyanide	5.2	22	5.2			220,000
23	Chlorodibromomethane	34	--	--			34
26	Chloroform	--	--	--			--
27	Dichlorobromomethane	46	--	--			46
44	Vinyl Chloride	525	--	--			525
54	Phenol	4,600,000	--	--			4,600,000
68	Bis(2-ethylhexyl)Phthalate	5.9	--	--			5.9
81	Di-n-Butyl Phthalate	12,000	--	--			12,000
97	N-Nitrosodi-n-Propylamine	1.4	--	--			1.4

"--" No water quality criteria available
"N/A" Not Applicable to the receiving water.

3. Determining the Need for WQBELs

In accordance with section 1.3 of the SIP, the Colorado River Basin Water Board conducted a RPA for each priority pollutant with an applicable criterion or objective to determine if a WQBEL is required in the Order. The Colorado River Basin Water Board analyzed effluent data to determine if a pollutant in a discharge has the reasonable potential to cause or contribute to an excursion above a state water quality standard. For all parameters that have the reasonable potential to cause or contribute to an excursion above a water quality standard, numeric WQBELs are required. The RPA considers criteria from the CTR and NTR, and when applicable, water quality objectives specified

in the Basin Plan. To conduct the RPA, the Colorado River Basin Water Board identified the maximum observed effluent concentration (MEC) for each constituent, based on data provided by the Discharger.

Section 1.3 of the SIP provides the procedures for determining reasonable potential to exceed applicable water quality criteria and objectives. The SIP specifies three triggers to complete a RPA:

a. Trigger 1 – If the MEC is greater than or equal to the CTR water quality criteria or applicable objective (C), a limit is needed.

b. Trigger 2 – If background water quality (B) > C and the pollutant is detected in the effluent, a limit is needed.

c. Trigger 3 – If other related information, such as a 303(d) listing for a pollutant, discharge type, compliance history, etc., indicates that a WQBEL is required.

Sufficient effluent and ambient data are needed to conduct a complete RPA. If data are not sufficient, the Discharger will be required to gather the appropriate data for the Colorado River Basin Water Board to conduct the RPA. In accordance with section 1.2 of the SIP, the Colorado River Basin Water Board shall have discretion to consider if any data are inappropriate for use in determining reasonable potential.

The RPA was performed on available priority pollutant monitoring data collected by the Discharger from monthly samples collected during the period from January 2014 through March 2017 for zinc, cyanide, and bis(2-ethylhexyl)phthalate. In addition, data from analyses of annual samples collected for priority pollutants during the period from December 2014 through January 2017.

Based on the RPA, the discharge demonstrates reasonable potential to cause or contribute to an excursion above a water quality standard for bis(2-ethylhexyl)phthalate, copper, mercury, and cyanide.

A review of monitoring data reported during the term of Order R7-2012-0011 showed that for zinc, there were a number of detected values; however, none were greater than the most stringent applicable water quality criterion.

Data evaluated in the RPA for priority pollutants reported in detectable concentrations in the effluent are summarized in Table F-10.

Table F-10. Summary of Reasonable Potential Analysis

CTR No.	Priority Pollutant	Applicable Water Quality Criteria (C)	Max. Effluent Concentration (MEC)	Max. Detected Receiving Water Concentration (B)	RPA Result – Effluent Limit Required?	Reason
		µg/L	µg/L	µg/L		
6	Copper	30.50	262	< 0.82	Yes	MEC > C
7	Lead	18.58	6	< 0.14	No	MEC < C & B < C
8	Mercury	0.051	11	< 0.05	Yes	MEC > C
11	Silver	44.05	10	< 0.4	No	MEC < C & B < C
13	Zinc	387.83	190	13.4	No	MEC < C & B < C
14	Cyanide	5.2	40	10	Yes	MEC > C
23	Chlorodibromomethane	34	0.6	< 0.08	No	MEC < C & B < C
26	Chloroform	No Criteria	2	< 0.12	No	No Criteria

CTR No.	Priority Pollutant	Applicable Water Quality Criteria (C)	Max. Effluent Concentration (MEC)	Max. Detected Receiving Water Concentration (B)	RPA Result – Effluent Limit Required?	Reason
		µg/L	µg/L	µg/L		
27	Dichlorobromomethane	46	1.1	< 0.1	No	MEC < C & B < C
44	Vinyl Chloride	525	94.9	< 0.08	No	MEC < C & B < C
54	Phenol	4,600,000	2	2.6	No	MEC < C & B < C
68	Bis(2-ethylhexyl)Phthalate	5.9	335	< 0.01	Yes	MEC > C
81	Di-n-Butyl Phthalate	12,000	9.4	4.3	No	MEC < C & B < C
97	N-Nitrosodi-n-Propylamine	1.4	< 0.59	3.4	No	B < C & MEC is ND

"--" Data are not available. BPJ = Best Professional Judgment

4. WQBEL Calculations

a. Final WQBELs are based on monitoring results and following the calculation process outlined in section 1.4 of the SIP. A table providing the calculations for all applicable WQBELs for this Order is provided in Attachment G of this Order.

b. **WQBELs Calculation Example**

Using cyanide as an example, the following demonstrates how WQBELs based on a human health criterion were established for Order R7-2017-0016. The process for developing these limits is in accordance with section 1.4 of the SIP. Attachment G summarizes the development and calculation of all WQBELs for this Order using the process described below.

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria or objective. For each criterion determine the effluent concentration allowance (ECA) using the following steady state equation:

$ECA = C + D(C-B)$ when $C > B$, and

$ECA = C$ when $C \leq B$,

Where C = The priority pollutant criterion/objective, adjusted if necessary for hardness, pH and translators. In this Order an upstream receiving water hardness value of 400 mg/L (as $CaCO_3$) was used for development of hardness-dependent criteria, and a pH of 6.87 was used for pH-dependent criteria.
D = dilution credit, and
B = ambient background concentration

For this Order, dilution was not allowed due to the nature of the receiving water and quantity of the effluent; therefore:

$ECA = C$

For cyanide, the applicable water quality criteria are:

ECA_{acute}= *22 µg/L*

$ECA_{chronic}$= *5.2 µg/L*

$ECA_{human\ health}$= *220,000 µg/L*

Step 2: For each ECA based on aquatic life criterion/objective, determine the long-term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in section 1.4, Step 3 of the SIP and will not be repeated here.

$LTA_{acute} = ECA_{acute} \times Multiplier_{acute}$

$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic}$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6.

For cyanide, the following data was used to develop the acute and chronic LTA using Table 1 of the SIP:

No. of Samples Available	CV	$Multiplier_{acute}$	$Multiplier_{chronic}$
3	0.60	0.32	0.53

LTA_{acute} = 22 µg/L x 0.32 = 7.06 µg/L

$LTA_{chronic}$ = 5.2 µg/L x 0.53 = 2.74 µg/L

Step 3: Select the most limiting (lowest) of the LTA.

LTA = most limiting of LTA_{acute} or $LTA_{chronic}$

For cyanide, the most limiting LTA was the LTA_{acute}

LTA = *2.74* µg/L

Step 4: Calculate the WQBELs by multiplying the LTA by a factor (multiplier). WQBELs are expressed as Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL). The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations. The value of the multiplier varies depending on the probability basis, the coefficient of variation (CV) of the data set, the number of samples (for AMEL) and whether it is monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the

CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in section 1.4, Step 5 of the SIP and will not be repeated here.

$AMEL_{aquatic\ life} = LTA \times AMEL_{multiplier}$

$MDEL_{aquatic\ life} = LTA \times MDEL_{multiplier}$

AMEL multipliers are based on a 95th percentile occurrence probability, and the MDEL multipliers are based on the 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

For cyanide, the following data was used to develop the AMEL and MDEL for aquatic life using Table 2 of the SIP:

No. of Samples per Month	CV	$Multiplier_{MDEL}$	$Multiplier_{AMEL}$
4	0.60	3.11	1.55

$AMEL_{aquatic\ life} = 2.74 \times 1.55 = 4.26\ \mu g/L$

$MDEL_{aquatic\ life} = 2.74 \times 3.11 = 8.54\ \mu g/L$

Step 5: For the ECA based on human health, set the AMEL equal to the

$ECA_{human\ health}$

For cyanide:

$AMEL_{human\ health} = 220{,}000\ \mu g/L$

Step 6: Calculate the MDEL for human health by multiplying the AMEL by the ratio of the $Multiplier_{MDEL}$ to the $Multiplier_{AMEL}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

$MDEL_{human\ health} = AMEL_{human\ health} \times (Multiplier_{MDEL} / Multiplier_{AMEL})$

For cyanide, the following data were used to develop the $MDEL_{human\ health}$:

No. of Samples per Month	CV	$Multiplier_{MDEL}$	$Multiplier_{AMEL}$	Ratio
4	0.60	3.11	1.55	2.01

$MDEL_{human\ health} = 220{,}000\ \mu g/L \times 2.01 = 441{,}362\ \mu g/L$

Step 6: Select the lower of the AMEL and MDEL based on aquatic life and human health as the water-quality based effluent limit for the Order.

$AMEL_{aquatic\ life}$	$MDEL_{aquatic\ life}$	$AMEL_{human\ health}$	$MDEL_{human\ health}$
4.3 µg/L	8.5 µg/L	220,000 µg/L	441,362 µg/L

The lowest (most restrictive) effluent limits for cyanide are based on aquatic life and were incorporated into this Order.

c. WQBELs Based on Basin Plan Objectives

i. **E. Coli.** The Basin Plan states that any discharge to a water body with a REC-1 designated use shall not have bacterial densities in excess of the following:

(a) ***E. Coli.*** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a Most Probable Number (MPN) of 126 per 100 milliliters, nor shall any sample exceed the maximum allowable bacterial density of a MPN of 400 per 100 milliliters.

(b) **Enterococci.** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 33 per 100 milliliters, nor shall any sample exceed the maximum allowable bacterial density of a MPN of 100 per 100 milliliters.

(c) **Fecal Coliform.** The log mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 200 per 100 milliliters, nor shall more than ten percent of the total samples during any 30-day period exceed a MPN of 400 per 100 milliliters.

Effluent limitations for *E. coli*, enterococci, and fecal coliform are incorporated in this Order. The bacterial indicators of *E. coli,* enterococci, and fecal coliform are used to estimate the presence of pathogens in the wastewater effluent discharged to Discharge Point 001. Effluent limitations for *E. coli,* enterococci, and fecal coliform shall be used as an indicator to determine the effectiveness of the municipal wastewater treatment facilities disinfection system.

ii. **Oil and Grease.** The Basin Plan contains narrative water quality objectives for oil and grease and floating material in surface waters, which state: "*All waters shall be free from substances attributable to wastewater of domestic or industrial origin or other discharges which adversely affect beneficial uses not limited to: floating as debris, scum, grease, oil, wax, or other matter that may cause nuisance.*" In addition, as discussed in section III.C.7 of this Fact Sheet, the anti-degradation provisions of the State Water Board Resolution No. 68-16 state that: "*Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*"

Oil and grease is a pollutant that generally may be found in sanitary waste from households, businesses and industries, and for which POTWs typically are designed to remove. Oil and grease removal is typically achieved during primary treatment. Based on information included in self-monitoring reports submitted by the Discharger, annual effluent samples for oil and grease indicate their presence in the effluent (one detectable concentration at 110 mg/L).

Therefore, the discharge demonstrates a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative objective for oil and grease and floating material. This Order carries forward the MDEL for oil and grease, to implement the narrative water quality objective contained in the Basin Plan, which will provide protection of the beneficial uses of the Coachella Valley Storm Drain. The effluent limitation for oil and grease is

carried forward from the previous Order and is originally based on the numeric limitation (MDEL) included in the adopted General Order R7-2015-0006, *NPDES Permit for Low Threat Discharges to Surface Waters Within the Colorado River Basin Region.*

iii. **Whole Effluent Toxicity (WET).** The Basin Plan specifies a narrative objective for toxicity, requiring that all waters be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alterations in population, community ecology, or receiving water biota.

The Previous Order contained narrative toxicity language and triggers, and monitoring requirements. Based on quarterly monitoring data reported by the Discharger between October 2012 and February 2016, the maximum observed chronic toxicity measurement was 1 TUc. The Discharger will continue to conduct toxicity monitoring once per quarter (four times per year).

This Order implements the narrative objective for toxicity, requiring there shall be no toxicity in the treatment plant effluent. In addition, the Order establishes thresholds that when exceeded requires the Discharger to conduct accelerated toxicity testing and/or conduct toxicity reduction evaluation (TRE) studies.

In addition to the Basin Plan requirements, section 4 of the SIP states that a chronic toxicity effluent limitation is required in permits for all discharges that will cause, have the reasonable potential to cause, or contribute to chronic toxicity in receiving waters. Therefore, in accordance with the SIP, this Order requires the Discharger to conduct chronic toxicity testing for discharges to the receiving water.

5. Summary of Water Quality-based Effluent Limitations

Table F-11. Summary of Water Quality-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Escherichia Coli (E. coli)	MPN/100 ml	126[1]	--	400[2]	--	--
Enterococci	MPN/100 ml	33[1]	--	100[2]	--	--
Fecal coliform	MPN/100 ml	200[1]	--	400[3]	--	--
Copper, Total Recoverable	µg/L	25	--	50	--	--
	lbs/day[4]	0.052	--	0.104	--	--
Mercury, Total Recoverable	µg/L	0.051	--	0.102	--	--
	lbs/day[4]	0.0001	--	0.0002	--	--
Cyanide, Free	µg/L	4.3	--	8.5	--	--
	lbs/day[4]	0.009	--	0.018	--	--
Bis(2-ethylhexyl)Phthalate	µg/L	5.9	--	12	--	--
	lbs/day[4]	0.012	--	0.025	--	--
Oil and grease, Total	mg/L	--	--	25	--	--
	lbs/day[4]	--	--	52	--	--

[1] This effluent limitation is expressed as a geometric (or log) mean, based on a minimum of not less than five equally spaced samples collected for any 30-day period.
[2] This effluent limitation is expressed as a maximum single sample value.
[3] No more than ten percent of the total fecal coliform samples collected during any 30-day period shall exceed a MPN of 400 per 100 milliliters.
[4] The mass-based effluent limitations are based on a design capacity of 0.25 MGD.

(a) **Toxicity**: There shall be no toxicity in the treatment plant effluent, as defined in section V of the MRP. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or toxicity tests of appropriate duration or other appropriate methods specified by the Colorado River Basin Water Board.

(b) **Total Dissolved Solids**: Discharges of wastes or wastewater shall not increase the TDS content of receiving waters, unless it can be demonstrated to the satisfaction of the Colorado River Basin Water Board that such an increase in TDS does not adversely affect beneficial uses of receiving waters.

D. Final Effluent Limitation Considerations

1. Anti-Backsliding Requirements

Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. The effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order, except for zinc.

i. **Zinc:** Effluent limitations for zinc is discontinued in this Order based on the consideration of new information pursuant to CWA section 402(o)(2)(B)(ii). The current discharge monitoring data and reasonable potential analysis demonstrated that the discharge does not have reasonable potential to cause or contribute to an exceedance of a zinc water quality objective.

This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

2. Anti-degradation Policies

Section 131.12 of the code of federal regulation requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires discharges to waters of the State be regulated to achieve the "highest water quality consistent with maximum benefit to the State." It also establishes the intent that where waters of the State are of higher quality than that required by state policies, including Water Quality Control Plans, such higher quality "shall be maintained to the maximum extent possible" unless it is demonstrated that any change in quality will be consistent with maximum benefit to people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in plans and policies (e.g., violation of any water quality objective). The discharge is also required to meet waste discharge requirements that result in the best practicable treatment or control necessary to assure that pollution or nuisance will not occur, and that the highest water quality consistent with maximum benefit to the people will be maintained.

Changes in this Order are not expected to result in degradation. This Order removes WQBELs for zinc as discussed above. The removal of zinc WQBELs is not expected to affect the quality of the discharge or to degrade the receiving waters. The discharge was

found to have no reasonable potential to contribute to an exceedance for zinc. Thus, the removal of the effluent limitation for zinc, is consistent with federal and state antidegradation policy and a complete anti-degradation analysis is not required.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD_5, TSS, percent removal, and pH are specified in Federal regulations as discussed in 40 C.F.R. part 133 and the Permit's technology-based pollutant restrictions are no more stringent than required by the CWA. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to Title 40, C.F.R. section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by the U.S. EPA on May 18, 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under State law and submitted to and approved by U.S. EPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to U.S. EPA prior to May 30, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 C.F.R. section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

E. Interim Effluent Limitations – Not Applicable

F. Final Effluent Limitations

Table F-12 below summarizes the proposed effluent limitations for the discharge from the treatment system through Discharge Point 001. Proposed effluent limitations are based on equivalent to secondary treatment standards, California Toxics Rule, and Colorado River Basin Plan Water Quality Standards.

1. Mass-based Effluent Limitations

Title 40 C.F.R. section 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and section 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in section 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations are established using the following formula:

Mass (lbs/day) = flow rate (MGD) x 8.34 x effluent limitation (mg/L)

where: Mass = mass limitation for a pollutant (lbs/day)

Effluent limitation = concentration limit for a pollutant (mg/L)

Flow rate = discharge flow rate (MGD)

2. Final Effluent Limitations

i. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the MRP.

Table F-12. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Flow	MGD	0.25	--	--	--	--	BPJ
BOD_5	mg/L	45	65	--	--	--	40 CFR 133
	lbs/day[1]	94	140	--	--	--	
TSS	mg/L	45	65	--	--	--	40 CFR 133
	lbs/day[1]	94	140	--	--	--	
pH	standard units	--	--	--	6.0	9.0	40 CFR 133
Oil and Grease[2]	mg/L	--	--	25	--	--	Basin Plan
	lbs/day[1]	--	--	52	--	--	
Copper, Total Recoverable	µg/L	25	--	50	--	--	CTR, SIP
	lbs/day[1]	0.052	--	0.104	--	--	
Mercury, Total Recoverable	µg/L	0.051	--	0.102	--	--	CTR, SIP
	lbs/day[1]	0.0001	--	0.0002	--	--	
Cyanide	µg/L	4.3	--	8.5	--	--	CTR, SIP
	lbs/day[1]	0.009	--	0.018	--	--	
Bis(2-ethylhexyl)Phthalate	µg/L	5.9	--	12	--	--	CTR, SIP
	µg/L	5.9	--	12	--	--	

1 The mass-based effluent limitations are based on a design capacity of 0.25 MGD.
2 Total oil and grease shall include the polar and non-polar fraction of oil and grease materials.

a) **Percent Removal**: The average monthly percent removal of BOD 5-day 20°C shall not be less than 65 percent.

ii. **Toxicity:** There shall be no toxicity in the treatment plant effluent, as defined in section V of the MRP. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or toxicity tests of appropriate duration or other appropriate methods specified by the Colorado River Basin Water Board.

iii. **Bacteria:** The bacterial concentrations in the wastewater effluent discharged to the New River (via an unnamed tributary) shall not exceed the following concentrations, as measured by the following bacterial indicator:

a) ***E. Coli.*** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 126 per 100 milliliters, nor shall any sample exceed the maximum allowable bacterial density of a MPN of 400 per 100 milliliters.

b) **Enterococci.** The geometric mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not

exceed a MPN of 33 per 100 milliliters, nor shall any sample exceed the maximum allowable bacterial density of a MPN of 100 per 100 milliliters.

c) **Fecal Coliform.** The log mean bacterial density (based on a minimum of not less than five samples equally spaced over a 30-day period) shall not exceed a MPN of 200 per 100 milliliters, nor shall more than ten percent of the total samples during any 30-day period exceed a MPN of 400 per 100 milliliters.

iv. **Total Dissolved Solids:** Discharges of wastes or wastewater shall not increase the TDS content of receiving waters, unless it can be demonstrated to the satisfaction of the Colorado River Basin Water Board that such an increase in TDS does not adversely affect beneficial uses of receiving waters.

G. Land Discharge Specifications – Not Applicable

H. Recycling Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

The surface water receiving water limitations in the proposed Order are based upon the water quality objectives contained in the Basin Plan and is carried forward from the previous Order. As such, they are a required part of the proposed Order. The receiving water limitations for dissolved oxygen, temperature, pH and TDS are as follows:

Dissolved Oxygen: The discharge shall not cause the concentration of dissolved oxygen in the receiving water to fall below 5.0 mg/L. When the dissolved oxygen in the receiving water is already below 5.0 mg/L, the discharge shall not cause any further depression.

Temperature: The discharge shall not result in the natural receiving water temperature to be altered, unless it can be demonstrated to the satisfaction of the Colorado River Basin Water Board that such alteration in temperature does not adversely affect beneficial uses.

pH: The discharge shall not result in the normal ambient pH of the receiving water to fall below 6.0 or exceed 9.0 units.

Total Dissolved Solids: The discharge shall not cause the concentration of TDS in New River via unnamed tributary to exceed an annual average concentration of 4,000 mg/L or a maximum daily concentration of 4,500 mg/L.

B. Groundwater – Not Applicable

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 C.F.R. section 122.42.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations

must be included in the Order. Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 C.F.R. sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

This provision is based on 40 C.F.R. part 123. The Colorado River Basin Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations, modification in disposal practices, or adoption of new regulations by the State Water Board or Colorado River Basin Water Board, including revisions to the Basin Plan.

2. Special Studies and Additional Monitoring Requirements

a. **TRE Work Plan, Toxicity Identification Evaluations, and Toxicity Reduction Evaluations.** This provision is based on the SIP, section 4, Toxicity Control Provisions.

b. **Translator Study**. This provision is based on the SIP. This provision allows the Discharger to conduct an optional translator study, based on the SIP at the Discharger's discretion. This provision is based on the need to gather site-specific information in order to apply a different translator from the default translator specified in the CTR and SIP. Without site-specific data, the default translators are used with the CTR criteria.

c. **Total Dissolved Solids Study**. The purpose of this study is to provide more detailed information on the Regional Board's development of salinity standards pursuant to section 303 of the CWA and through the NPDES permitting authority in the regulation of municipal and industrial sources (see section 402 of the Federal Water Pollution Control Act). The Discharger shall provide an annual update regarding progress made on identification of areas where infiltration may cause changes in TDS level, and submit a summary report on activities to reduce TDS level and result of the activities to the Colorado River Basin Water Board prior to the filing date for renewal application.

3. Best Management Practices and Pollution Prevention

a. **Pollutant Minimization Program**. This provision is based on the requirements of section 2.4.5 of the SIP.

b. **Storm Water.** This provision is based on Water Quality Order 2014-0057-DWQ, NPDES General Permit No. CAS000001 for Discharges of Storm Water Associated with Industrial Activities.

4. Construction, Operation, and Maintenance Specifications

a. **Facility and Treatment Operation**. This provision is based on the requirements of section 122.41(e) and the previous Order.

b. **Anti-degradation Analysis and Engineering Report for Significant Expansion**. This requirement is required if the Discharger proposes to significantly upgrade existing treatment systems. The Discharger would be required to evaluate treatment capacity, address mass increases of pollutants discharged, and propose additional units as necessary to enable adequate treatment, while ensuring that any proposed

increases in discharges will not violate the State Water Board's anti-degradation policy.

c. **Spill Response Plan**. This provision is based on the requirements of section 122.41(e) and the previous Order.

5. Special Provisions for Municipal Facilities (POTWs Only)

The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order 2006-0003-DWQ (General Order) on May 2, 2006. The Monitoring and Reporting Requirements for the General Order were amended by Water Quality Order WQ 2008-0002-EXEC on February 20, 2008. The General Order requires public agencies that own or operate sanitary sewer systems with greater than one mile of pipes or sewer lines to enroll for coverage under the General Order. The General Order requires agencies to develop sanitary sewer management plans (SSMPs) and report all sanitary sewer overflows (SSOs), among other requirements and prohibitions. Furthermore, the General Order contains requirements for operation and maintenance of collection systems and for reporting and mitigating sanitary sewer overflows. Inasmuch that the Discharger's collection system is part of the system that is subject to this Order, certain standard provisions are applicable as specified in Provisions, section VI.C.5. For instance, the 24-hour reporting requirements in this Order are not included in the General Order. The Discharger must comply with both the General Order and this Order. The Discharger and public agencies that are discharging wastewater into the facility were required to obtain enrollment for regulation under the General Order by December 1, 2006.

a. **Pretreatment Program Requirements**. Requirements are based on the previous Order and 40 C.F.R. part 403.

b. **Collection Systems.** Requirements are based on 40 C.F.R. section 122.41.

6. Other Special Provisions

Special Provisions VI.C.6.a and VI.C.6.b are included to ensure the compliance with requirements established in this Order R7-2017-0016**,** and are based on the previous Order, the CWA, U.S. EPA regulations, CWC, and Colorado River Basin Water Board plans and policies.

7. Special Provisions Reporting Schedules

The compliance schedules specify the deliverables and due dates for the TRE Work Plan, TDS Study, and Spill Response Plan for compliance with the Permit requirements.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

CWA section 308 and 40 C.F.R. sections 122.41(h), (j)-(*l*), 122.44(i), and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Colorado River Basin Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The Monitoring and Reporting Program (MRP), Attachment E of this Order establishes monitoring, reporting, and recordkeeping requirements that implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

This Order carries forward the treatment plant influent monitoring requirements.

B. Effluent Monitoring

The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are given in the

proposed MRP. This provision requires compliance with the MRP, and is based on 40 C.F.R. sections 122.44(i), 122.62, 122.63 and 124.5. The MRP is a standard requirement in almost all NPDES permits (including the proposed Order) issued by the Colorado River Basin Water Board. In addition to containing definitions of terms, it specifies general sampling/analytical protocols and the requirements of reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the CWC, and Colorado River Basin Water Board's policies. The MRP also contains sampling program specific for the Discharger's wastewater treatment facility. It defines the sampling stations and frequency, pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all pollutants for which effluent limitations are specified. Further, in accordance with section 1.3 of the SIP, periodic monitoring is required for all priority pollutants defined by the CTR, for which criteria apply and for which no effluent limitations have been established, to evaluate reasonable potential to cause or contribute to an excursion above a water quality standard.

Monitoring for those pollutants expected to be present in the discharge from the Facility at Discharge Point 001 (Monitoring Location EFF-001) will be required as shown in the proposed MRP and as required by the SIP.

Effluent monitoring requirements are unchanged from the previous Order except zinc. This monitoring is necessary in order to verify compliance with effluent limitations for these parameters that have been newly established in this Order. Monthly monitoring for zinc has been removed because effluent limitations for this parameter have been removed. However, the Discharger is still required to conduct annual samples for zinc as part of priority pollutant monitoring.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) testing requirements establish monitoring of the effluent to ensure that the receiving water quality is protected from the aggregate toxic effect of a mixture of pollutants in the effluent. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. This permit requires chronic toxicity testing.

This requirement establishes conditions and protocol by which compliance with the Basin Plan narrative water quality objective for toxicity will be demonstrated. Conditions include required monitoring and evaluation of the effluent for chronic toxicity and numerical values for chronic toxicity evaluation to be used as 'triggers' for initiating accelerated monitoring and toxicity reduction evaluation(s).

The Order establishes chronic toxicity testing and monitoring triggers, which when exceeded, initiates accelerated testing, TRE, and TIE procedures. This Order also includes implementation procedures for toxicity caused by ammonia, ionic imbalance, and elevated TDS concentrations.

U.S. EPA has developed a statistical approach that assesses the WET measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. The approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The TST approach examines whether an effluent at the critical concentration (e.g., in-stream waste concentration or IWC, as recommended in EPA's Technical Support Document (TSD) (U.S. EPA 1991) and implemented under EPA's WET National Pollutant Discharge Elimination System (NPDES) permits program) and the control within a WET test differ by an unacceptable amount; i.e., the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive.

The TST approach explicitly incorporates test power (the ability to correctly classify the effluent as nontoxic) and provides a positive incentive to generate valid, high quality WET

data to make informed decisions regarding NPDES WET reasonable potential (RP) and permit compliance determinations. Once the WET test has been conducted, the TST approach can be used to analyze the WET test results to assess whether the effluent discharge is toxic at the critical concentration. The TST approach is designed to be used for a two concentration data analysis of the IWC or a receiving water concentration (RWC) compared to a control concentration.

Using the TST approach, permitting authorities and Dischargers will have more confidence when making NPDES determinations as to whether an effluent discharge is toxic or non-toxic. Use of the TST approach does not result in any changes to EPA's WET test methods; however, a facility might want to modify its future WET tests by increasing the number of replicates over the minimum required to increase test power, which is the probability of declaring an effluent non-toxic if the organism response at the IWC is truly acceptable.

D. Receiving Water Monitoring

1. Surface Water

Surface water monitoring is required to determine compliance with receiving water limitations and to characterize the water quality of the receiving water pursuant to the Basin Plan. Monitoring requirements for the receiving water are unchanged from the previous Order. Additionally, annual monitoring for priority pollutants in the upstream receiving water has been continued, as required in accordance with the SIP.

2. Groundwater - Not Applicable

VIII. PUBLIC PARTICIPATION

The Colorado River Basin Water Board has considered the issuance of WDRs that will serve as an NPDES permit for the Discharger. As a step in the WDR adoption process, the Colorado River Basin Water Board staff has developed tentative WDRs and has encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties

The Colorado River Basin Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided through the following the Imperial Valley Press newspaper.

The public had access to the agenda and any changes in dates and locations through the Colorado River Basin Water Board's website at:
http://www.waterboards.ca.gov/coloradoriver/board_info/agenda/

B. Written Comments

Interested persons were invited to submit written comments concerning tentative WDRs as provided through the notification process. Comments were due either in person or by mail to the Executive Office at the Colorado River Basin Water Board at 73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260.

To be fully responded to by staff and considered by the Colorado River Basin Water Board, the written comments were due at the Colorado River Basin Water Board office by **5:00 p.m. on November 8, 2017.**

C. Public Hearing

The Colorado River Basin Water Board held a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: November 9, 2017

Time: 9:00 AM
Location: California Regional Water Quality Control Board
Colorado River Basin Region Board Room
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

Interested persons were invited to attend. At the public hearing, the Colorado River Basin Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested in writing.

D. Reconsideration of Waste Discharge Requirements

Any person aggrieved by this action of the Colorado River Basin Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and the California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

For instructions on how to file a petition for review, see
http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

E. Information and Copying

The Report of Waste Discharge, other supporting documents, and comments received are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through Colorado River Basin Water Board by calling (760) 346-7491.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Colorado River Basin Water Board, reference this Facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Jeong-Hee Lim at (760) 776-8940.

ATTACHMENT G – SUMMARY OF WQBELS CALCULATIONS

The WQBELs developed for this Order are summarized below and were calculated as described in the methodology summarized in Attachment F, Fact Sheet and are contained in section IV.A.1.a of this Order.

Table G-1. Summary of WQBELs Calculations

CTR #	Parameter	Human Health Calculations			Aquatic Life Calculations											Effluent Limitations	
		Organism Only			Freshwater												
		AMEL HH = ECA = C HH only	MDEL/ AMEL multiplier	MDEL HH	ECA acute = C acute	ECA acute multiplier	LTA acute	ECA chronic = C chronic	ECA chronic multiplier	LTA chronic	Lowest LTA	AMEL multiplier 95	AMEL aquatic life	MDEL multiplier 99	MDEL aquatic life	AMEL	MDEL
		µg/L		µg/L	µg/L		µg/L	µg/L		µg/L	µg/L					µg/L	µg/L
6	Copper, Total Recoverable	–	–	–	51.68	0.32	16.59	30.50	0.53	16.09	16.09	1.55	24.97	3.11	50.10	25.0	50.1
8	Mercury, Total Recoverable	0.051	2.01	0.102	–	–	–	–	–	–	–	1.55	–	3.11	–	0.051	0.102
14	Cyanide	220,000	2.01	441,362	22	0.32	7.06	5.2	0.53	2.74	2.74	1.55	4.26	3.11	8.54	4.3	8.5
68	Bis(2-ethylhexyl)Phthalate	5.9	2.01	11.8	–	–	–	–	–	–	–	1.55	–	3.11	–	5.9	12

Geotechnical Report – 2026 Update

Seeley Wastewater Treatment Plant Improvements
NWC West Main Street and New River Boulevard
Seeley, California

Prepared for:

Hazen and Sawyer
101 Montgomery Street, Suite 1500
San Francisco, CA 94104



Prepared by:

Landmark Consultants, Inc.
780 N. 4th Street
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February 2026

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February 25, 2026

Mr. Gregg A. Cummings, PE
Hazen and Sawyer
101 Montgomery Street, Suite 1500
San Francisco, CA 94104

Geotechnical Investigation Report Update
Seeley Wastewater Treatment Plant Improvements
NWC West Main Street and New River Blvd.
Seeley, California
LCI Report No. LE26033

Dear Mr. Cummings:

Landmark Consultants, Inc. is providing this summary report to update the Geotechnical Report prepared by Landmark Consultants, Inc. for proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at the northwest corner of West Main Street and New River Boulevard in Seeley, California. Landmark Consultants, Inc. conducted a geotechnical investigation in February 2021 (LCI Project No. LE21017, dated February 26, 2021) for the project site. It is our understanding that the original project scope has remained unchanged.

This update report presents selected elements of our findings and professional opinions only. It does not present all details that may be needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are related best through reading the full geotechnical report (LCI Report No. LE21017, dated February 26, 2021) provided in Appendix 3, and with the active participation of the engineer of record who developed them during design and construction of the project.

Seismic Parameters

Seismic Risk: The project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial Fault represents a transition from the more continuous San Andreas Fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (USGS, 1990). We have performed a computer-aided search of known faults or seismic zones that lie within a 39-mile radius of the project site as provided in Table 1 in Appendix 1.

Review of the current Earthquake Fault Zone maps (CGS, 2026a) indicated that the nearest zoned faults are the Superstition Hills fault located approximately 5.4 miles northeast of the project site and the Laguna Salada fault located approximately 11.4 miles south of the project site

Site Acceleration: The project site is considered likely to be subjected to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Accelerations also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

CBC General Ground Motion Parameters: The 2025 California Building Code (CBC) general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2026) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions.

The project site has been determined to lie within Seismic Design Category D and the subsurface soils have been classified as Soil Site Class DE in accordance with ASCE 7-22 Section 20.4. The CBC requires that structures be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7. ASCE 7-22 Section 11.4.3 states that risk targeted maximum considered earthquake (MCE_R) spectral response acceleration parameters S_1, S_s, S_{MS} and S_{M1} shall be obtained from the USGS Seismic Design Geodatabase for the applicable site class. The design response spectrum was determined in accordance with ASCE 7-22 Section 11.4.5 and is taken as 2/3 of the multi-period 5%-damped MCE_R response spectrum from the USGS Seismic Design Geodatabase.

The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGA_M) value to be used for liquefaction and seismic settlement analysis in accordance with 2025 CBC Section 1803.5.12 and ASCE 7-22 Section 11.8.3 is estimated at 0.48g for the project site. **The MCE_R response spectrum and the design earthquake ground motion parameters are provided in Table 2 in Appendix 1.**

Subsurface Soil and Groundwater

The subsurface soils encountered during the field exploration conducted on February 16, 2021 consist of about 4 feet of stiff silty clay/clayey silt (CL-ML) soils. A medium dense silty sand/sandy silt (SM-ML) layer was encountered to a depth of 4 feet to 13 feet below ground surface. Medium stiff to stiff clay soils (CL-CH) were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration. The findings of the geotechnical investigations indicate that the native near surface soils exhibit low swell potential (Expansion Index, EI = 21 to 50). Groundwater was previously encountered at a depth of approximately 10 feet below ground surface at the project site.

Liquefaction Potential

Liquefaction occurs when granular soils below the water table are subjected to vibratory motions, such as those produced by earthquakes. With strong ground shaking, the pore water pressure increases as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations. Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2010) methods. The 1997 NCEER method utilizes direct SPT blow counts from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected blow count $N_{1(60)}$. The analysis was performed using a PGA_M value of 0.48g with a 10-foot groundwater depth and a threshold factor of safety (FS) of 1.3. Computer printouts of the analysis are provided in Appendix 2.

The fines content of the liquefiable sands and silts increases the liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures.

Prior to calculating the settlements, the field SPT blow counts were corrected to account for the type of hammer, borehole diameter, overburden pressure and rod length $N_{1(60)}$ in accordance with Idriss and Boulanger (2010). The corrected blow counts were then converted to equivalent clean sand blow counts ($N_{1(60)cs}$).

The soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within a 3-foot thick silt layer at a depth of 10 to 13 feet below ground surface. The likely triggering mechanism for liquefaction appears to be strong ground shaking associated with the rupture of the Superstition Hills and other nearby faults. The analysis is summarized in the table below.

Summary of Liquefaction Analysis

Boring Location	Depth To First Liquefiable Zone (ft)	Potential Induced Settlement (in)
B-1	0	0
B-2	10	½

Liquefaction Induced Settlements: ***Based on empirical relationships, total induced settlements are estimated to be about ½ inch should liquefaction occur.*** Differential settlement is estimated at one-half of the total potential settlement (Martin and Lew, 1999). Accordingly, there is a potential for ¼ inch of liquefaction induced differential settlement over a distance of 100 feet at the project site. **The designer is referred to ASCE7-16, Section 12.13.9.2.1 and Table 12.13-3 for limitations for tolerable differential settlement.**

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003).

Liquefaction induced lateral spreading may occur at this site due to the incised New River channel located along the west margin of the project site. According to Youd (2005), if the liquefiable layer lies at a depth greater than about twice the height of a free face, lateral spread is not likely to develop. Evidence of landslide is visible along the embankment of the New River channel.

Mitigation: Ground improvement methods are available to mitigate liquefaction such as deep soil mixing (cement), vibro-compaction, vibro-replacement, geopiers, stone columns, compaction grouting, or deep dynamic compaction. Some other means to mitigate liquefaction damage include either a deep foundation system or rigid mat foundations and grade-beam reinforced foundations that can withstand the differential movement or tilting but will not protect fracturing of buried utilities from damage (CGS, 2008). Based on an estimate of less than ½ inch of liquefaction induced settlements, no ground improvement or deep foundation mitigation is required at this project site.

Site Preparation and Construction

The recommendations for building pad preparation, foundations, excavations, utility trench backfill and pavement structural sections provided in the February 2021 geotechnical report are still valid.

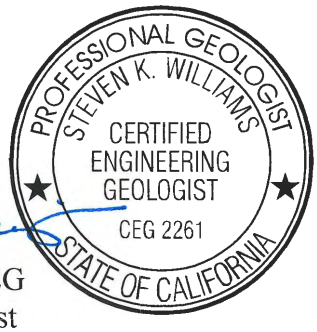
Closure

Based on the geotechnical conditions encountered at the points of exploration during previous geotechnical investigations conducted at the project site, the project site is suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to ensure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 370-3000.

Respectfully Submitted,
Landmark Consultants, Inc.





Peter E. LaBrucherie, PE, GE
Principal Geotechnical Engineer

Steven K. Williams, PG, CEG
Senior Engineering Geologist



Julian R. Avalos, PE, GE
Senior Geotechnical Engineer

APPENDIX 1

Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Route 247*	4.9	7.9			
Superstition Hills	5.4	8.6	6.6	23 ± 2	4 ± 2
Superstition Mountain	6.4	10.2	6.6	24 ± 2	5 ± 3
Yuha*	6.9	11.1			
Northern Centinela*	7.8	12.5			
Shell Beds	8.1	13.0			
Yuha Well *	8.3	13.2			
Imperial	11.2	17.9	7	62 ± 6	20 ± 5
Laguna Salada	11.4	18.2	7	67 ± 7	3.5 ± 1.5
Vista de Anza*	11.6	18.5			
Painted Gorge Wash*	13.3	21.2			
Brawley *	13.4	21.4			
Ocotillo*	15.8	25.2			
Borrego (Mexico)*	16.6	26.5			
Rico *	17.4	27.8			
Elmore Ranch	18.5	29.6	6.6	29 ± 3	1 ± 0.5
Elsinore - Coyote Mountain	19.2	30.7	6.8	39 ± 4	4 ± 2
San Jacinto - Borrego	22.9	36.6	6.6	29 ± 3	4 ± 2
Pescadores (Mexico)*	24.0	38.4			
Cerro Prieto *	24.6	39.3			
Cucapah (Mexico)*	26.1	41.8			
San Andreas - Coachella	38.5	61.6	7.2	96 ± 10	25 ± 5

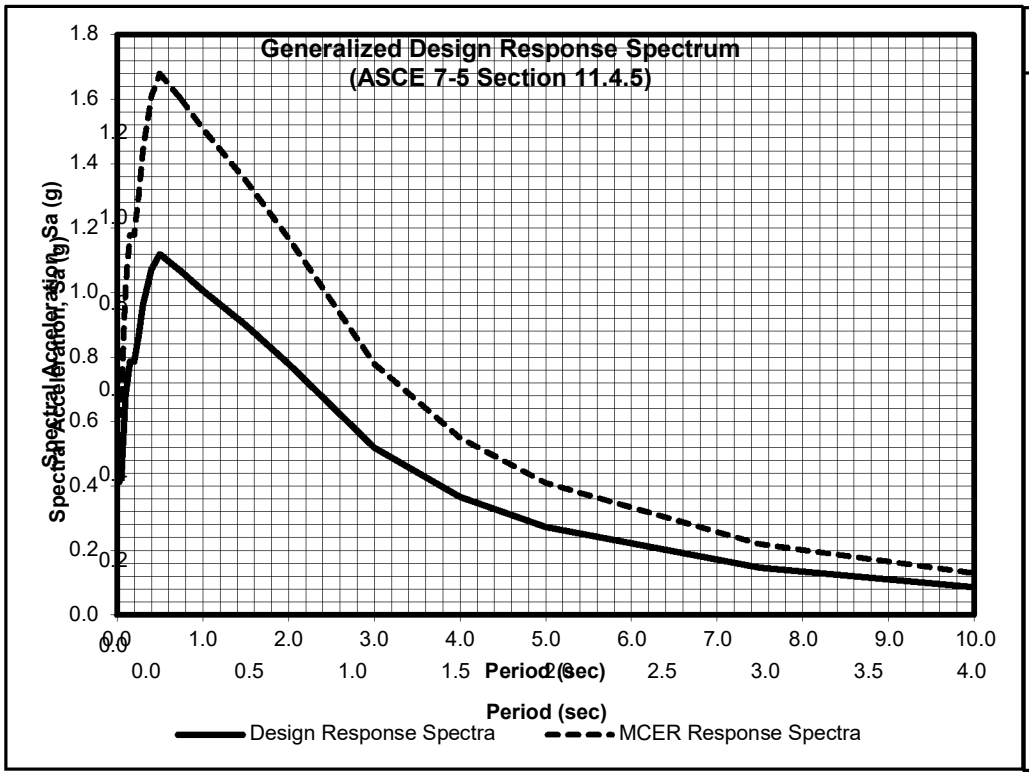
* Note: Faults not included in CGS database.

Table 2
2025 California Building Code (CBC) and ASCE 7-22 Seismic Parameters

Soil Site Class:	**DE**
Latitude:	32.7934 N
Longitude:	-115.7001 W
Risk Category:	III
Seismic Design Category:	D

Multi-Period MCE_R and Design Response Spectrum Parameters

MCE_R, 5% damped, Spectral Response Acceleration Parameter (0.2 s)	S_s	1.50	
MCE_R, 5% damped, Spectral Response Acceleration Parameter (1.0 s)	S_1	0.60	
MCER, 5% damped, Spectral Response Accel. Parameter Adjusted for Site Class Effects (0.2 s)	S_{MS}	1.51	
MCER, 5% damped, Spectral Response Accel. Parameter Adjusted for Site Class Effects (1.0 s)	S_{M1}	2.11	
Design, 5% damped, Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	1.01	
Design, 5% damped, Spectral Response Acceleration Parameter (1.0 s)	S_{D1}	1.41	
Long-period Transition Period	T_L	8	sec
Mapped MCE_G Peak Ground Acceleration	PGA_M	0.48	g



T (sec)	MCE_R Sa (g)	Design Sa (g)
0.00	0.61	0.41
0.01	0.62	0.41
0.02	0.62	0.41
0.03	0.62	0.41
0.05	0.65	0.43
0.08	0.85	0.57
0.10	1.02	0.68
0.15	1.18	0.79
0.20	1.18	0.79
0.25	1.30	0.87
0.30	1.44	0.96
0.40	1.61	1.07
0.50	1.68	1.12
0.75	1.60	1.07
1.00	1.51	1.01
1.50	1.35	0.90
2.00	1.17	0.78
3.00	0.78	0.52
4.00	0.55	0.37
5.00	0.41	0.27
7.50	0.22	0.15
10.00	0.13	0.09

APPENDIX 2

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Upgrades - Seeley, CA
Project No.: LE26033
Location: B-1

Maximum Credible Earthquake	7		**Borehole Diameter**	4	in.
Design Ground Motion	0.48	g	**Rod Length**	3	ft.
Total Unit Weight,	Variable	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	82		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data				Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer	Cummulative
Depth	Blow	Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence	Subsidence
(ft)	Counts	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)	(inches)
1	12	0	5.99	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.00
2	12	0	11.97	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.00
3	12	0	17.96	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.00
4	12	1	21.07	1	12	1.37	1.00	0.75	1.0	1.70	21	31	26.31	0.28		10.00	0.00	0.00
5	12	1	26.33	1	12	1.37	1.00	0.75	1.0	1.70	21	31	26.31	0.28		10.00	0.00	0.00
6	12	1	31.60	1	12	1.37	1.00	0.75	1.0	1.66	20	31	25.86	0.27		10.00	0.00	0.00
7	12	1	36.87	1	12	1.37	1.00	0.80	1.0	1.56	20	31	25.81	0.27		10.00	0.00	0.00
8	30	1	42.13	1	20	1.37	1.00	0.80	1.0	1.37	30	31	35.72	1.12		10.00	0.00	0.00
9	30	1	47.40	1	20	1.37	1.00	0.80	1.0	1.32	29	31	34.63	0.89		10.00	0.00	0.00
10	30	1	52.64	1	20	1.37	1.00	0.80	1.0	1.28	28	31	33.65	0.74	0.22	3.40	0.00	0.00
11	30	1	54.92	1	20	1.37	1.00	0.85	1.0	1.25	29	31	34.79	0.92	0.23	4.04	0.00	0.00
12	30	1	57.20	1	20	1.37	1.00	0.85	1.0	1.24	29	31	34.40	0.85	0.24	3.54	0.00	0.00
13	8	0	68.81	1	8	1.37	1.00	0.85	1.0	1.23	11	100	16.87	0.15	0.30	0.49	0.00	0.00
14	8	0	71.81	1	8	1.37	1.00	0.85	1.0	1.20	11	100	16.63	0.15	0.31	0.47	0.00	0.00
15	8	0	74.81	1	8	1.37	1.00	0.85	1.0	1.17	11	100	16.40	0.15	0.32	0.45	0.00	0.00
16	8	0	77.80	1	8	1.37	1.00	0.85	1.0	1.15	11	100	16.18	0.14	0.33	0.43	0.00	0.00
17	8	0	80.80	1	8	1.37	1.00	0.95	1.0	1.13	12	100	17.17	0.15	0.34	0.45	0.00	0.00
18	11	0	83.80	1	8	1.37	1.00	0.95	1.0	1.11	11	100	16.44	0.15	0.35	0.42	0.00	0.00
19	11	0	86.80	1	8	1.37	1.00	0.95	1.0	1.09	11	100	16.25	0.14	0.35	0.41	0.00	0.00
20	11	0	89.79	1	8	1.37	1.00	0.95	1.0	1.07	11	100	16.06	0.14	0.36	0.40	0.00	0.00
21	11	0	92.79	1	8	1.37	1.00	0.95	1.0	1.05	10	100	15.87	0.14	0.36	0.39	0.00	0.00
22	11	0	95.79	1	8	1.37	1.00	0.95	1.0	1.03	10	100	15.70	0.14	0.37	0.38	0.00	0.00
23	9	0	98.78	1	9	1.37	1.00	0.95	1.0	1.01	12	100	17.33	0.15	0.37	0.41	0.00	0.00
24	9	0	101.78	1	9	1.37	1.00	0.95	1.0	1.00	12	100	17.14	0.15	0.38	0.40	0.00	0.00
25	9	0	104.78	1	9	1.37	1.00	0.95	1.0	0.98	11	100	16.97	0.15	0.38	0.40	0.00	0.00
26	9	0	107.78	1	9	1.37	1.00	0.95	1.0	0.97	11	100	16.80	0.15	0.38	0.39	0.00	0.00
27	9	0	110.77	1	9	1.37	1.00	0.95	1.0	0.95	11	100	16.63	0.15	0.39	0.38	0.00	0.00
28	8	0	113.77	1	5	1.37	1.00	0.95	1.0	0.93	7	100	12.02	0.11	0.40	0.29	0.00	0.00
29	8	0	116.77	1	5	1.37	1.00	0.95	1.0	0.92	6	100	11.92	0.11	0.40	0.29	0.00	0.00
30	8	0	119.77	1	5	1.37	1.00	1.00	1.0	0.91	7	100	12.16	0.12	0.40	0.29	0.00	0.00
31	8	0	122.76	1	5	1.37	1.00	1.00	1.0	0.89	7	100	12.06	0.11	0.40	0.29	0.00	0.00
32	8	0	125.76	1	5	1.37	1.00	1.00	1.0	0.88	6	100	11.97	0.11	0.40	0.28	0.00	0.00
33	12	0	128.76	1	12	1.37	1.00	1.00	1.0	0.89	15	100	20.07	0.18	0.39	0.46	0.00	0.00
34	12	0	131.76	1	12	1.37	1.00	1.00	1.0	0.88	14	100	19.90	0.18	0.39	0.45	0.00	0.00
35	12	0	134.75	1	12	1.37	1.00	1.00	1.0	0.87	14	100	19.73	0.18	0.40	0.44	0.00	0.00
36	12	0	137.75	1	12	1.37	1.00	1.00	1.0	0.86	14	100	19.57	0.17	0.40	0.44	0.00	0.00
37	12	0	140.75	1	12	1.37	1.00	1.00	1.0	0.85	14	100	19.41	0.17	0.40	0.43	0.00	0.00
38	8	0	143.74	1	5	1.37	1.00	1.00	1.0	0.81	6	100	11.46	0.11	0.41	0.27	0.00	0.00
39	8	0	146.74	1	5	1.37	1.00	1.00	1.0	0.80	6	100	11.39	0.11	0.41	0.27	0.00	0.00
40	8	0	149.74	1	5	1.37	1.00	1.00	1.0	0.79	6	100	11.31	0.11	0.41	0.27	0.00	0.00
41	8	0	152.74	1	5	1.37	1.00	1.00	1.0	0.78	6	100	11.24	0.11	0.41	0.27	0.00	0.00
42	8	0	155.73	1	5	1.37	1.00	1.00	1.0	0.77	6	100	11.17	0.11	0.41	0.27	0.00	0.00
43	9	0	158.73	1	9	1.37	1.00	1.00	1.0	0.78	10	100	15.11	0.14	0.41	0.33	0.00	0.00
44	9	0	161.73	1	9	1.37	1.00	1.00	1.0	0.77	10	100	15.01	0.14	0.41	0.33	0.00	0.00
45	9	0	164.73	1	9	1.37	1.00	1.00	1.0	0.77	9	100	14.91	0.13	0.41	0.33	0.00	0.00
46	9	0	167.72	1	9	1.37	1.00	1.00	1.0	0.76	9	100	14.81	0.13	0.41	0.33	0.00	0.00
47	9	0	170.72	1	9	1.37	1.00	1.00	1.0	0.75	9	100	14.72	0.13	0.41	0.33	0.00	0.00
48	10	0	173.72	1	10	1.37	1.00	1.00	1.0	0.75	10	100	15.71	0.14	0.40	0.35	0.00	0.00
49	10	0	176.71	1	10	1.37	1.00	1.00	1.0	0.74	10	100	15.61	0.14	0.40	0.35	0.00	0.00
50	10	0	179.71	1	10	1.37	1.00	1.00	1.0	0.73	10	100	15.51	0.14	0.40	0.34	0.00	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils* , Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) | **0.00** | **0.00**

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Upgrades - Seeley, CA
Project No.: LE26033
Location: B-2

Maximum Credible Earthquake	7		**Borehole Diameter**	4	in.
Design Ground Motion	0.48	g	**Rod Length**	3	ft.
Total Unit Weight,	Variable	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	82		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data				Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer	Cummulative
Depth	Blow	Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence	Subsidence
(ft)	Counts	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)	(inches)
1	12	0	5.99	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.54
2	12	0	11.97	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.54
3	12	0	17.96	1	12	1.37	1.00	0.75	1.0	1.70	21	95	26.41	0.28		10.00	0.00	0.54
4	21	1	21.07	1	14	1.37	1.00	0.75	1.0	1.70	25	31	30.43	0.44		10.00	0.00	0.54
5	21	1	26.33	1	14	1.37	1.00	0.75	1.0	1.70	25	31	30.43	0.44		10.00	0.00	0.54
6	21	1	31.60	1	14	1.37	1.00	0.75	1.0	1.61	24	31	29.14	0.38		10.00	0.00	0.54
7	21	1	36.87	1	14	1.37	1.00	0.80	1.0	1.51	24	31	29.16	0.38		10.00	0.00	0.54
8	11	1	42.13	1	11	1.37	1.00	0.80	1.0	1.50	18	52	23.60	0.22		10.00	0.00	0.54
9	11	1	47.40	1	11	1.37	1.00	0.80	1.0	1.42	17	52	22.75	0.21		10.00	0.00	0.54
10	11	1	52.64	1	11	1.37	1.00	0.80	1.0	1.36	16	52	22.01	0.20	0.25	0.80	0.17	0.54
11	11	1	54.92	1	11	1.37	1.00	0.85	1.0	1.33	17	52	22.63	0.21	0.26	0.79	0.17	0.37
12	11	1	57.20	1	11	1.37	1.00	0.85	1.0	1.31	17	52	22.33	0.21	0.28	0.74	0.20	0.20
13	10	0	68.81	1	7	1.37	1.00	0.85	1.0	1.23	10	100	15.15	0.14	0.31	0.44	0.00	0.00
14	10	0	71.81	1	7	1.37	1.00	0.85	1.0	1.21	9	100	14.93	0.13	0.32	0.42	0.00	0.00
15	10	0	74.81	1	7	1.37	1.00	0.85	1.0	1.18	9	100	14.73	0.13	0.33	0.41	0.00	0.00
16	10	0	77.80	1	7	1.37	1.00	0.85	1.0	1.16	9	100	14.54	0.13	0.34	0.39	0.00	0.00
17	10	0	80.80	1	7	1.37	1.00	0.95	1.0	1.13	10	100	15.37	0.14	0.34	0.40	0.00	0.00
18	8	0	83.80	1	8	1.37	1.00	0.95	1.0	1.10	11	100	16.96	0.15	0.35	0.43	0.00	0.00
19	8	0	86.80	1	8	1.37	1.00	0.95	1.0	1.08	11	100	16.75	0.15	0.35	0.42	0.00	0.00
20	8	0	89.79	1	8	1.37	1.00	0.95	1.0	1.07	11	100	16.56	0.15	0.36	0.41	0.00	0.00
21	8	0	92.79	1	8	1.37	1.00	0.95	1.0	1.05	11	100	16.37	0.15	0.36	0.40	0.00	0.00
22	8	0	95.79	1	8	1.37	1.00	0.95	1.0	1.03	11	100	16.19	0.14	0.37	0.39	0.00	0.00
23	14	0	98.78	1	9	1.37	1.00	0.95	1.0	1.01	12	100	17.89	0.16	0.37	0.43	0.00	0.00
24	14	0	101.78	1	9	1.37	1.00	0.95	1.0	1.00	12	100	17.70	0.16	0.37	0.42	0.00	0.00
25	14	0	104.78	1	9	1.37	1.00	0.95	1.0	0.98	12	100	17.52	0.15	0.38	0.41	0.00	0.00
26	14	0	107.78	1	9	1.37	1.00	0.95	1.0	0.97	12	100	17.34	0.15	0.38	0.40	0.00	0.00
27	14	0	110.77	1	9	1.37	1.00	0.95	1.0	0.95	12	100	17.17	0.15	0.38	0.39	0.00	0.00
28	6	0	113.77	1	6	1.37	1.00	0.95	1.0	0.94	7	100	12.77	0.12	0.40	0.30	0.00	0.00
29	6	0	116.77	1	6	1.37	1.00	0.95	1.0	0.92	7	100	12.66	0.12	0.40	0.30	0.00	0.00
30	6	0	119.77	1	6	1.37	1.00	1.00	1.0	0.91	7	100	12.94	0.12	0.40	0.30	0.00	0.00
31	6	0	122.76	1	6	1.37	1.00	1.00	1.0	0.90	7	100	12.83	0.12	0.40	0.30	0.00	0.00
32	6	0	125.76	1	6	1.37	1.00	1.00	1.0	0.88	7	100	12.73	0.12	0.40	0.30	0.00	0.00
33	15	0	128.76	1	10	1.37	1.00	1.00	1.0	0.88	12	100	17.41	0.15	0.40	0.39	0.00	0.00
34	15	0	131.76	1	10	1.37	1.00	1.00	1.0	0.87	12	100	17.26	0.15	0.40	0.38	0.00	0.00
35	15	0	134.75	1	10	1.37	1.00	1.00	1.0	0.86	12	100	17.12	0.15	0.40	0.38	0.00	0.00
36	15	0	137.75	1	10	1.37	1.00	1.00	1.0	0.85	11	100	16.98	0.15	0.40	0.37	0.00	0.00
37	15	0	140.75	1	10	1.37	1.00	1.00	1.0	0.84	11	100	16.84	0.15	0.40	0.37	0.00	0.00
38	10	0	143.74	1	10	1.37	1.00	1.00	1.0	0.83	11	100	16.86	0.15	0.40	0.37	0.00	0.00
39	10	0	146.74	1	10	1.37	1.00	1.00	1.0	0.82	11	100	16.73	0.15	0.40	0.37	0.00	0.00
40	10	0	149.74	1	10	1.37	1.00	1.00	1.0	0.81	11	100	16.61	0.15	0.40	0.36	0.00	0.00
41	10	0	152.74	1	10	1.37	1.00	1.00	1.0	0.80	11	100	16.49	0.15	0.40	0.36	0.00	0.00
42	10	0	155.73	1	10	1.37	1.00	1.00	1.0	0.80	11	100	16.37	0.15	0.40	0.36	0.00	0.00
43	9	0	158.73	1	9	1.37	1.00	1.00	1.0	0.78	10	100	15.11	0.14	0.41	0.33	0.00	0.00
44	9	0	161.73	1	9	1.37	1.00	1.00	1.0	0.77	10	100	15.01	0.14	0.41	0.33	0.00	0.00
45	9	0	164.73	1	9	1.37	1.00	1.00	1.0	0.77	9	100	14.91	0.13	0.41	0.33	0.00	0.00
46	9	0	167.72	1	9	1.37	1.00	1.00	1.0	0.76	9	100	14.81	0.13	0.41	0.33	0.00	0.00
47	9	0	170.72	1	9	1.37	1.00	1.00	1.0	0.75	9	100	14.72	0.13	0.41	0.33	0.00	0.00
48	10	0	173.72	1	10	1.37	1.00	1.00	1.0	0.75	10	100	15.71	0.14	0.40	0.35	0.00	0.00
49	10	0	176.71	1	10	1.37	1.00	1.00	1.0	0.74	10	100	15.61	0.14	0.40	0.35	0.00	0.00
50	10	0	179.71	1	10	1.37	1.00	1.00	1.0	0.73	10	100	15.51	0.14	0.40	0.34	0.00	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils* , Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) | **0.54** | **0.54**

APPENDIX 3

Geotechnical Report

Seeley Wastewater Treatment Plant Improvements
NWC West Main Street and New River Boulevard
Seeley, California

Prepared for:

Hazen and Sawyer
11260 El Camino Real, Suite 102
San Diego, CA 92130



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February 26, 2021

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Geotechnical Report
SCWD WWTP Improvements
NWC West Main Street and New River Blvd.
Seeley, California
LCI Report No. LE21017

Dear Mr. Alexander:

This geotechnical report is provided for design and construction of the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California. Our geotechnical exploration was conducted in response to your request for our services. The enclosed report describes our soil engineering site evaluation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

Based on the geotechnical conditions encountered at the points of exploration, the project site appears suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 370-3000.

Respectfully Submitted,
Landmark Consultants, Inc.

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EXECUTIVE SUMMARY

This executive summary presents ***selected*** elements of our findings and professional opinions. This summary ***may not*** present all details needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are ***best related through reading the full report***, and are best evaluated with the active participation of the engineer of record who developed them. The findings of this study are summarized below:

Aerated

- Subsurface soils consist of about 4 feet of stiff silty clay/clayey silt (CL-ML) soils of low to moderate swell potential (Expansion Index, EI = 21 to 90). Medium dense silty sand/sandy silt (SM-ML) layer was encountered to a depth of 4 feet to 13 feet below ground surface. Medium stiff to stiff clay soils (CL-CH) were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration.

- The new office building foundation designs should mitigate expansive soil conditions by either the removal and replacement of the upper 2.5 feet of clay/silt soils with non-expansive soil. Alternatively, foundations may be designed to resist expansive forces, such as flat plate structural mats, or grade-beam stiffened floor slabs. A combination of the methods described above may also be used.

- The risk of liquefaction induced settlement is low. Liquefaction can occur within a 9-foot-thick sandy silt/silty sand layer encountered at a depth of 4 feet below ground surface. Potential liquefaction induced settlements of less than 1 inch have been estimated for the project site. There is a very low risk of ground rupture and/or sand boil formation should liquefaction occur.

- Low to moderate sulfate and severe chloride levels were encountered in the soil samples tested for this study. However, in consideration of general corrosive environment in the vicinity, it is recommended that concrete mixes for concrete placed in contact with native soils shall have a maximum water cement ratio of 0.45 and a minimum compressive strength of 4,500 psi (minimum of 6 sacks Type V cement per cubic yard). All concrete should be thoroughly vibrated to remove rock pockets and minimize air voids.

- All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934). Hold-down straps at the foundation perimeter and pressurized water lines below or within the foundations are not allowed.

Section 1
INTRODUCTION

1.1 Project Description

This report presents the findings of our geotechnical exploration and soil testing for the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California (See Vicinity Map, Plate A-1).

The proposed improvements will consist of a septage receiving station, MBR Package, sludge drying beds, office building and several small structures to support equipment such pumps, control panels and/or electrical gear. A site plan for the proposed development was provided by the client at the time that this report was prepared. Site development will include; subgrade preparation for structures, basin excavations, underground utility installation including trench backfill and concrete foundation construction.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the subsurface soil at selected locations within the site for evaluation of physical/engineering properties and liquefaction potential during seismic events. Professional opinions were developed from field and laboratory test data and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction. The scope of our services consisted of the following:

- Field exploration and in-situ testing of the site soils at selected locations and depths.
- Laboratory testing for physical and/or chemical properties of selected samples.
- Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- Engineering analysis and evaluation of the data collected.
- Preparation of this report presenting our findings and professional opinions regarding the geotechnical aspects of project design and construction.

This report addresses the following geotechnical parameters:

- Subsurface soil and groundwater conditions
- Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- Liquefaction potential and its mitigation
- Expansive soil and methods of mitigation
- Aggressive soil conditions to metals and concrete

Professional opinions with regard to the above parameters are provided for the following:

- Site grading and earthwork
- Building pad and foundation subgrade preparation
- Allowable soil bearing pressures and estimated settlements
- Concrete slabs-on-grade
- Lateral earth pressures
- Excavation conditions and buried utility installations
- Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- Seismic design parameters

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions, storm water infiltration, groundwater mounding, or landscape suitability of the soil.

1.3 Authorization

Hazen and Sawyer provided authorization by Subcontract Agreement for Professional Services for our work on January 18, 2021. We conducted our work according to our written proposal dated November 17, 2020.

Section 2
METHODS OF INVESTIGATION

2.1 Field Exploration

Subsurface exploration was performed on February 16, 2021 using 2R Drilling of Chino, California to advance two (2) borings to depths of 51.5 feet below existing ground surface. The borings were advanced with a truck-mounted, CME 75 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers. The approximate boring locations were established in the field and plotted on the site map by sighting to discernible site features. The boring locations are shown on the Site and Exploration Plan (Plate A-2).

A professional engineer observed the drilling operations and maintained logs of the soil encountered with sampling depths. Soils were classified during drilling according to the Unified Soil Classification System using the visual-manual procedure in accordance with ASTM D2488. Relatively undisturbed and bulk samples of the subsurface materials were obtained at selected intervals. The relatively undisturbed soil samples were retrieved using a 2-inch outside diameter (OD) split-spoon sampler or a 3-inch OD Modified California Split-Barrel (ring) sampler lined with 6-inch stainless-steel sleeves. In addition, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586 and ASTM D6066. The samples were obtained by driving the samplers ahead of the auger tip at selected depths using a 140-pound CME automatic hammer with a 30-inch drop. The number of blows required to drive the samplers the last 12 inches of an 18-inch drive depth into the soil is recorded on the boring logs as “blows per foot”. Blow counts (N values) reported on the boring logs represent the field blow counts. No corrections have been applied to the blow counts shown on the boring logs for effects of overburden pressure, automatic hammer drive energy, drill rod lengths, liners, and sampler diameter. Pocket penetrometer readings were also obtained to evaluate the stiffness of cohesive soils retrieved from sampler barrels.

After logging and sampling the soil, the exploratory borings were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

The subsurface logs are presented on Plates B-1 and B-2 in Appendix B. A key to the log symbols is presented on Plate B-3. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Laboratory Testing

Laboratory tests were conducted on selected bulk (auger cuttings) and relatively undisturbed soil samples obtained from the soil borings to aid in classification and evaluation of selected engineering properties of the site soils. The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- Plasticity Index (ASTM D4318)
- Particle Size Analyses (ASTM D422)
- Unit Dry Densities (ASTM D2937)
- Moisture Contents (ASTM D2216)
- Direct Shear (ASTM D3080)
- Unconfined Compression (ASTM D2166)
- Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods)

The laboratory test results are presented on the subsurface logs (Appendix B) and on Plates C-1 through C-4 in Appendix C.

Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were obtained from the field and laboratory testing program.

Section 3
DISCUSSION

3.1 Site Conditions

The existing Seeley Wastewater Treatment Plant (WWTP) is located at the northwest corner of West Main Road and New River Boulevard in western Seeley, California. The proposed improvements are located within an area that once consisted of three wastewater treatment ponds that are approximately 2 to 3 feet lower than the north side of the WWTP site. It is our understanding that these ponds were used for about 1 year, and then were abandoned roughly 30 years ago after a landslide and piping failure occurred on the New River bluffs along the western edge of the WWTP property. Water infiltration from the ponds accessed sand soil strata and emerged at the incised New River channel bluff.

The western edge portion of the WWTP were backfilled with undocumented fill to the existing WWTP ground level. The new improvements will be located at the west side of the existing Biolac and Aeration ponds. The new office building is planned to be located on the plant parking lot at the south side of the existing office building.

The Seeley WWTP is entirely surrounded by a chain-link fence with two access gates from the parking lot. Office and operation buildings, parking area and primary treatment ponds are located to the north side of the proposed improvements area. The western edge of the Seeley WWTP property is bordered by steep bluffs which descend to the bottom of an incised flood channel and the banks of the New River. The western bluff descending to the New River consists of two (2) benches, one of approximately 15 to 20 feet (upper bench) and one of 50 to 60 feet (lower bench) west of the Seeley WWTP site. Properties to the east of the Seeley WWTP consist of single-family residential homes. Vacant land abuts the south side of the WWTP property. Active irrigated agricultural land lies to the north side of the WWTP property.

The adjacent New River flood channel is incised into lake bed sediments, about 700 to 800 feet wide from bank to bank, and about 50 to 60 feet deep. The channel was created by floodwaters from the accidental diversion of the Colorado River between 1905 and 1907. The Boulder Canyon project constructed on the Colorado River in the 1930's has regulated flood waters on the river so that flooding does not occur. The incised New River Channel extends from Calexico to the Salton Sea.

The project site lies at an elevation of approximately 45 feet below mean sea level (MSL) (El. 955 local datum) in the Imperial Valley region of the California low desert. The surrounding properties lie on terrain which is flat (planar), part of a large agricultural valley, which was previously an ancient lake bed covered with fresh water to an elevation of 43± feet above MSL. Annual rainfall in this arid region is less than 3 inches per year with four months of average summertime temperatures above 100 °F. Winter temperatures are mild, seldom reaching freezing.

3.2 Geologic Setting

The project site is located in the Salton Trough region of the Colorado Desert physiographic province of southeastern California. The Salton Trough is a topographic and geologic structural depression resulting extending from the San Gorgonio Pass to the Gulf of California (Norris & Webb, 1990). The Salton Trough is bounded on the northeast by the San Andreas fault and Chocolate Mountains and the southwest by the Peninsular Range and faults of the San Jacinto Fault Zone. The Salton Trough represents the northward extension of the Gulf of California, containing both marine and non-marine sediments deposited since the Miocene Epoch (Morton, 1977). Tectonic activity that formed the trough continues at a high rate as evidenced by deformed young sedimentary deposits and high levels of seismicity. Figure 1 shows the location of the site in relation to regional faults and physiographic features.

The Imperial Valley is directly underlain by lacustrine deposits, which consist of interbedded lenticular and tabular silt, sand, and clay. The Late Pleistocene to Holocene (present) lake deposits are probably less than 100 feet thick and derived from periodic flooding of the Colorado River which intermittently formed a fresh water lake (Lake Cahuilla). Older deposits consist of Miocene to Pleistocene non-marine and marine sediments deposited during intrusions of the Gulf of California. Basement rock consisting of Mesozoic granite and Paleozoic metamorphic rocks are estimated to exist at depths between 15,000 - 20,000 feet.

3.3 Subsurface Soil

The UC Davis California Soil Resource Lab "SoilWeb Earth" computer application (UC Davis, 2021) for Google Earth indicates that surficial deposits at the project site consist predominantly of silty clay loams overlying fine sands of the Imperial, Indio and Holtville soil groups (see Plate A-3). These loams are formed in sediment and alluvium of mixed origin (Colorado River overflows and fresh-water lake-bed sediments).

The subsurface soils encountered during the field exploration conducted on February 16, 2021 consist of about 4 feet of stiff silty clay/clayey silt (CL-ML) soils. A medium dense silty sand/sandy silt (SM-ML) layer was encountered to a depth of 4 feet to 13 feet below ground surface. Medium stiff to stiff clay soils (CL-CH) were encountered below the sandy/silty layer to a depth of 51.5 feet, the maximum depth of exploration. The subsurface logs (Plates B-1 and B-2) depict the stratigraphic relationships of the various soil types.

The native surface silty clays/clayey silts likely exhibit low to moderate swell potential (Expansion Index, EI = 21 to 90) when correlated to Plasticity Index tests (ASTM D4318) performed on the native clays/silts. Sandy silty/silty sand soil layers exhibit very low to low swell potential (Expansion Index, EI = 10 to 30).

3.4 Groundwater

Groundwater was encountered in the borings at about 40 to 42 feet at the time of exploration, but may rise with time to approximately 10 to 12 feet below ground surface at this site. There is uncertainty in the accuracy of short-term water level measurements, particularly in fine-grained soil. Groundwater levels may fluctuate with water levels in the existing ponds, irrigation of adjacent properties, precipitation, drainage, and site grading. The referenced groundwater level should not be interpreted to represent an accurate or permanent condition. Our work scope did not include a groundwater surface mounding study resulting from applied landscape water.

3.5 Faulting

The project site is located in the seismically active Imperial Valley of southern California with numerous mapped faults of the San Andreas Fault System traversing the region. The San Andreas Fault System is comprised of the San Andreas, San Jacinto, and Elsinore Fault Zones in southern California. The Imperial fault represents a transition from the more continuous San Andreas fault to a more nearly echelon pattern characteristic of the faults under the Gulf of California (USGS, 1990). We have performed a computer-aided search of known faults or seismic zones that lie within a 62 mile radius of the project site (Table 1).

A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults. The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults (CGS, 2019b). Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the Alquist-Priolo Act (AP).

Review of the current Earthquake Fault Zone maps (CGS, 2019a) indicates that the nearest zoned fault is the Superstition Hills fault located approximately 5.4 miles north of the project site.

3.6 General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. **This project site has been classified as Site Class D and has a S_1 value of 0.6, which would require a site-specific ground motion hazard analysis**. However, ASCE 7-16 Section 11.4.8 provides three exceptions which permit the use of conservative values of design parameters for certain conditions for Site Class D and E sites in lieu of a site specific hazard analysis. The exceptions are:

- Exception 1: Structures on Site Class E sites with S_s greater than or equal to 1.0, provided the site coefficient F_a is taken as equal to that of Site Class C.
- Exception 2: Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Equations 12.8-2 for values of $T \leq 1.5T_S$ and taken as equal to 1.5 times the value computed in accordance with either Equation 12.8-3 for $T_L \geq T > 1.5T_S$ or Equation 12.8-4 for $T > T_L$.
- Exception 3: Structures on Site Class E sites with S_1 greater than or equal to 0.2, provided that T is less than or equal to T_S and the equivalent static force procedure is used for design.

The project structural engineer should confirm that an exception applies to the project. If none of the exceptions apply, our office should be consulted to perform a site-specific ground motion hazard analysis.

The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2021) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions. The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGA_M) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803.5.12 ($PGA_M = F_{PGA}*PGA$) is estimated at 0.65g for the project site. **Design earthquake ground motion parameters are provided in Table 2.**

3.7 Seismic and Other Hazards

- **Groundshaking.** The primary seismic hazard at the project site is the potential for strong groundshaking during earthquakes along the Imperial, Laguna Salada, and Superstition Hills faults.
- **Surface Rupture.** The California Geological Survey (2019b) has established Earthquake Fault Zones in accordance with the 1972 Alquist-Priolo Earthquake Fault Zone Act. The Earthquake Fault Zones consists of boundary zones surrounding well defined, active faults or fault segments. The project site does not lie within an A-P Earthquake Fault Zone; therefore, surface fault rupture is considered to be low at the project site.
- **Liquefaction and lateral spreading.** Liquefaction is a potential design consideration because of underlying saturated sandy substrata. Although the Imperial Valley has not yet been evaluated for seismic hazards by the California Geological Survey seismic hazards zonation program, liquefaction is well documented in the Imperial Valley after strong seismic events (McCrink, et al, 2011 and Rymer et al, 2011). The potential for liquefaction at the site is discussed in more detail in Section 3.8.

Other Potential Geologic Hazards.

- **Landsliding.** The project site is located within the incised New River channel. Even though the western portion of the WWTP property has been re-graded, there are indications of a landslide on the New River bluff along the western edge of the site. An alignment of tension cracks and piping (surface water ducts through embankment) were observed parallel to the New River bluff south of the Seeley WWTP. The geotechnical report prepared by Landmark Consultants in 2012 (Seeley WWTP Slope Stability Study – New River Bluff) indicated tension cracks associated with the landslide extending back into the area of the previously abandoned unlined wastewater ponds. Evidence of piping in the southwest corner of the site which has been covered by recent placement of undocumented fill on the western side of the project site was also mentioned in the 2012 Report.
- **Volcanic hazards.** The site is not located proximal to any known volcanically active area and the risk of volcanic hazards is considered low. Obsidian Butte and Red Hill, located at the south end of the Salton Sea approximately 25 miles north of the project site, are small remnants of volcanic domes. The domes erupted about 1,800 to 2,500 years ago (Wright et al, 2015). The subsurface brine fluids around the domes have a high heat flow and are currently being utilized to produce geothermal energy.

- **Tsunamis and seiches.** Tsunamis are giant ocean waves created by strong underwater seismic events, asteroid impact, or large landslides. Seiches are large waves generated in enclosed bodies of water in response to strong ground shaking. The site is not located near any large bodies of water, so the threat of tsunami, seiches, or other seismically-induced flooding is considered unlikely.
- **Flooding.** Based on our review of FEMA (2008) FIRM Panel 06025C1700C which encompasses the project site, the project site is located in Flood Zone X, an area determined to be outside the 0.2% annual chance (500-year) floodplain.
- **Collapsible soils.** Collapsible soil generally consists of dry, loose, low-density material that have the potential collapse and compact (decrease in volume) when subjected to the addition of water or excessive loading. Soils found to be most susceptible to collapse include loess (fine grained wind-blown soils), young alluvium fan deposits in semi-arid to arid climates, debris flow deposits and residual soil deposits. Due to the cohesive nature of the subsurface soils and shallow groundwater, the potential for hydro-collapse of the subsurface soils at this project site is considered very low.
- **Expansive soils.** In general, much of the near surface soils in the Imperial Valley consist of silty clays and clays which are moderate to highly expansive. The expansive soil conditions are discussed in more detail in Section 3.3.

3.8 Liquefaction

Liquefaction occurs when granular soils below the water table are subjected to vibratory motions, such as those produced by earthquakes. With strong ground shaking, the pore water pressure increases as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

(1) the soil must be saturated (relatively shallow groundwater);
(2) the soil must be loosely packed (low to medium relative density);
(3) the soil must be relatively cohesionless (not clayey); and
(4) groundshaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2008) methods. The 1997 NCEER methods utilize direct SPT blow counts from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected blow count $N_{1(60)}$. The analysis was performed using a PGA_M value of 0.65g was used in the analysis with a 10-foot groundwater depth and a threshold factor of safety (FS) of 1.3.

The fines content of the liquefiable sands and silts increases their liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures. Prior to calculating the settlements, the field SPT blow counts were corrected to account for the type of hammer, borehole diameter, overburden pressure and rod length $N_{1(60)}$ in accordance with Idriss and Boulanger (2008). The corrected blow counts were then converted to equivalent clean sand blow counts ($N_{1(60)cs}$).

The soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake. Liquefaction can occur within a 9-foot-thick sandy silt/silty sand layer encountered at a depth of 4 feet below ground surface. The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the Imperial, Laguna Salada, and Superstition Hills fault. The analysis is summarized in the table below.

Summary of Liquefaction Analysis

Boring Location	Depth To First Liquefiable Zone (ft)	Potential Induced Settlement (in)
B-1	10	---
B-2	10	1.0

Liquefaction Induced Settlements: ***Based on empirical relationships, total induced settlements are estimated to be about 1 inches should liquefaction occur.*** Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with California Special Publication 117. Accordingly, there is a potential for ⅔ inches of liquefaction induced differential settlement at the project site.

Because of the depth of the liquefiable layer, the 10-foot thick non-liquefiable clay layer will likely act as a bridge over the liquefiable layer resulting in a fairly uniform ground surface settlement; therefore, wide area subsidence of the soil overburden would be the expected effect of liquefaction rather than bearing capacity failure of the proposed structures.

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is unlikely because of the thickness of the overlying unliquefiable soil. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003).

Liquefaction induced lateral spreading is not expected to occur at the proposed improvements area due to the semi-planar topography. The only areas with lateral spreading potential are situated at the New River channel slopes, located approximately 175 to 200 feet west from the most western proposed structure (MBR Package). According to Youd (2005), if the liquefiable layer lies at a depth greater that about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site except for the shallow sludge drying bed, which depths are substantially above the first liquefiable layer.

Mitigation: Based on an estimate of less than 1 inch of liquefaction induced settlements, no ground improvement or deep foundation mitigation is required at this project site.

Section 4
DESIGN CRITERIA

4.1 Site Preparation

Preconstruction Meeting: A preconstruction conference should be held at the site prior to the beginning of grading operations with, as a minimum, the owner's representative, grading contractor and geotechnical engineer in attendance.

Clearing and Grubbing: All surface improvements, debris or vegetation including grass, trees, and weeds on the site at the time of construction should be removed from the construction area. Root balls should be completely excavated. Organic strippings should be stockpiled and not used as engineered fill. All trash, construction debris, concrete slabs, old pavement, landfill, contaminated soil, and buried obstructions such as old foundations and utility lines exposed during rough grading should be traced to the limits of the foreign material by the grading contractor and removed under our supervision. Any excavations resulting from site clearing should be sloped to a bowl shape to the lowest depth of disturbance and backfilled under the observation of the geotechnical engineer's representative.

Subgrade Preparation for Buildings (Shallow Foundations): The existing surface soil within building pad/foundation areas should be removed to 30 inches below the building pad elevation or existing natural surface grade (whichever is lower) extending five feet beyond all exterior wall/column lines (including concreted areas adjacent to the building). Exposed subgrade should be scarified to a depth of 8 inches, uniformly moisture conditioned to 5 to 10% above optimum moisture content (clays) or 2 to 6% above optimum (silts), and recompacted to 85 to 90% (clays) or 87 to 92% (silts) of the maximum density determined in accordance with ASTM D1557 methods. Alternately, to avoid special foundation designs for expansive soil, the surface 30 inches of native clays may be removed and replaced with granular fill, placed and compacted to at least 90% of ASTM D1557 maximum density.

The native soil is suitable for use as engineered fill provided it is free from concentrations of organic matter or other deleterious material. The fill soil should be uniformly moisture conditioned by discing and watering to the limits specified above, placed in maximum 8-inch lifts (loose), and compacted to the limits specified above. Clay soil should not be overcompacted because highly compacted soil will result in increased swelling.

Imported fill soil (for foundations designed for expansive soil conditions) should have a Plasticity Index less than 15 and sulfates (SO_4) less than 1,500 ppm.

If foundation designs are to be utilized which do not include provisions for expansive soil, an engineered building support pad consisting of 2.5 feet of granular soil, placed in maximum 8-inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture, should be placed below the bottom of the slab.

The imported soils should meet the USCS classifications of ML (non-plastic), SM, SP-SM, or SW-SM with a maximum rock size of 3 inches and no less than 5% passing the No. 200 sieve. The geotechnical engineer should approve imported fill soil sources before hauling material to the site. Imported fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture ±2%.

Sidewalk and Concrete Hardscape Areas: In areas other than the building pad which are to receive sidewalks or area concrete slabs, the ground surface should be presaturated to a minimum depth of 24 inches and then scarified to 8 inches, moisture conditioned to a minimum of 5% over optimum, and recompacted to 85-90% of ASTM D1557 maximum density just prior to concrete placement.

Site Preparation for Mat Foundations and/or Concrete Foundation Slabs: For equipment supported on shallow foundations, the existing soil within the foundation areas should be removed to 12 inches below the bottom of the proposed foundation elevation extending five feet beyond the perimeter walls. Exposed subgrade should be scarified to a depth of 12 inches, uniformly moisture conditioned to a minimum of 2 to 6% above optimum moisture content, and recompacted to a minimum of 90% of the maximum density determined in accordance with ASTM D1557 methods.

The area should then be brought to bottom of structure grade with 12 inches of Class 2 aggregate base, compacted to at least of 95% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture. Alternately, a geotextile filter fabric (Mirafi 180, equivalent or better) and 12 inches of 1” x No. 4 (Size 57) crushed rock may be used below the structures.

If foundation structures are anticipated to be founded 10 feet below existing subgrade, the subsurface silts/sands are anticipated to be wet or saturated, consequently, the subgrade has a high potential for pumping under equipment loads. Therefore, the subgrade for the new structure, should be overexcavated 24 inches below the bottom of the structure and replaced with drainage rock (ASTM C33, Size 57 or 467). The bottom of the excavation should be covered with a geotextile filter fabric (Mirafi 180, equivalent or better) lapped at sides and ends in accordance with manufacture's installations guidelines.

The 2.0 ft thick layer of drainage rock should be end dumped onto the filter fabric and spread evenly by excavators or dozers. Upon completing placement of the drainage rock a small vibratory compactor (walk-behind or equivalent) should be used to densify the crushed rock layer. Following densification of the drainage rock, a second layer of filter fabric should be placed over the drainage rock.

Sludge Drying Beds: The new sludge drying beds is planned to be constructed at the west side of the existing Biolac and Aeration ponds. Since groundwater is expected to be about 10 feet below ground surface, the bottom of the excavations should have a minimum distance of 2 feet above groundwater. Fine grading at the bottom of the basin may be difficult since clayey silt or sandy silts/silty sands are expected to be encountered at the bottom of the excavations.

All areas to receive new fill for the embankments should be stripped of all vegetation, scarified and recompacted for a minimum depth of 12 inches below the designed bottom basin elevation to 90% (minimum) of the maximum density at optimum moisture 2 to 6% in accordance with ASTM D1557 methods.

On-site materials from the excavation are anticipated to be used as embankment fill. The fill soils should consist of silty clay/clayey silt (CL-ML) and sandy silt/silty sands (ML-SM). The embankment fill should be uniformly moisture conditioned to 2-6 percent over optimum moisture and placed in 6 inch maximum lifts at 90% of ASTM D1557 maximum density.

If imported clay soils (CL-CH) from potential borrow sites are considered adequate for engineered embankment fill, they should be pulverized/disced to less than ¾ inch maximum clod size, uniformly moisture conditioned to 5-10 percent over optimum, and placed in 6 inch maximum lifts at a minimum of 90% of ASTM D1557 maximum density.

Taking into consideration that the slopes will be protected with a synthetic liner, the embankment slopes should be no steeper than 2:1. However, flatter slopes may be considered to permit maintenance. Embankments should be overbuilt by 6 inches and subsequently cut to the plan line and grade to remove loose material along the slope faces.

Moisture Control and Drainage: If clay soils are used at building pads (without 2.5 feet of granular, non-plastic soil), the moisture condition of the building pad should be maintained during trenching and utility installation until concrete is placed or should be rewetted by use of multiple applications of water with sprinklers before initiating delayed construction. If soil drying is noted in footings, a 2 to 3 inch depth of water may be used in the bottom of footings to restore footing subgrade moisture and reduce potential edge lift.

Adequate site drainage is essential to future performance of the project. Infiltration of excess irrigation water and stormwaters can adversely affect the performance of the subsurface soil at the site. Positive drainage should be maintained away from all structures (5% for 10 feet minimum across unpaved areas) to prevent ponding and subsequent saturation of the native clay soil. Gutters and downspouts should be used as a means to convey water away from foundations.

Observation and Density Testing: All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm. Full-time observation services during the excavation and scarification process is necessary to detect undesirable materials or conditions and soft areas that may be encountered in the construction area. The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*" and, as such, shall perform additional tests and investigation as necessary to satisfy themselves as to the site conditions and the geotechnical parameters for site development.

Auxiliary Structures Foundation Preparation: Auxiliary structures such as free standing or retaining walls should have footings extended to a minimum of 30 inches below grade. The existing soil beneath the structure foundation prepared in the manner described for the building pad except the preparation needed only to extend 18 inches below and beyond the footing.

4.2 Foundations and Settlements

Shallow spread footings are suitable to support the light loaded buildings provided they are structurally tied with grade-beams to continuous perimeter wall footings to resist differential movement associated with potentially expansive soils. Structural concrete mat foundations are suitable to support the MBR Package or other heavy equipment structure. Footings shall be founded on a layer of properly prepared and compacted soil as described in Section 4.1. The foundations may be designed using an allowable soil bearing pressure of 1,500 psf for compacted native soils and 2,000 psf when foundations are supported on imported sands or aggregate base (extending a minimum of 1.0 feet below footings). The allowable soil pressure may be increased by 20% for each foot of embedment depth in excess of 18 inches and by one-third for short term loads induced by winds or seismic events. The maximum allowable soil pressure at increased embedment depths shall not exceed 3,000 psf.

As an alternative to shallow spread foundations, flat plate structural mats or grade-beam reinforced foundations may be used to mitigate expansive soil heave and/or liquefaction related movement.

Flat Plate Structural Mats: Flat plate structural mats may be used to mitigate expansive soils at the project site. Structural concrete mat foundations may be designed using an allowable soil bearing pressure of 2,000 psf when the foundation is supported on 12 inches of compacted Class 2 aggregate base. The allowable soil pressure may be increased by one-third for short term loads induced by winds or seismic events. Design criteria for mat foundations are provided below. The structural mat shall have a double mat of steel (minimum No. 4's @ 12 inches O.C. each way – top and bottom) and a minimum thickness of 10 inches.

Structural mats may be designed for a modulus of subgrade reaction (Ks) of 50 pci when placed on compacted native soil, 150 pci when placed on 12 inches of compacted Class 2 aggregate base, or a subgrade modulus of 250 pci when placed on 24 inches of crushed rock (below grade structures) and when placed on 2.5 feet of granular fill (buildings).

Grade-beam Reinforced Foundations: Structures with grade beam reinforced foundations placed on the native soils shall have a maximum grade-beam spacing of 25 feet on center.

All footings should be embedded a minimum of 18 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum width of 24 inches. Recommended concrete reinforcement and sizing for all footings should be provided by the structural engineer.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. Passive resistance to lateral earth pressure may be calculated using an equivalent fluid pressure of 250 pcf (300 pcf for imported sands or crushed rock) to resist lateral loadings. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.25 (0.35 for imported sands, aggregate base or crushed rock) may also be used at the base of the footings to resist lateral loading.

Settlements: Small buildings and small equipment foundations movement under the estimated static (non-seismic) loadings and static site conditions are estimated to not exceed ¾ inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed. Seismically induced liquefaction settlement of the surrounding land mass and structure may be on the order of 1 inch (total) and ⅔ inches (differential).

4.3 Slabs-On-Grade

Structural Concrete: Structural concrete slabs are those slabs (foundations) that underlie structures or patio covers (shades). These slabs that are placed over native clay soil should be either a uniformly thick structural mats (10 inches or greater) or should be designed in accordance with Chapter 18 of the 2019 CBC and shall be a minimum of 5 inches thick due to expansive soil conditions. Concrete floor slabs shall be monolithically placed with the footings (no cold joints) unless placed on 2.5 feet of import granular fill soil.

American Concrete Institute (ACI) guidelines (ACI 302.1R-04 Chapter 3, Section 3.2.3) provide recommendations regarding the use of moisture barriers beneath concrete slabs. The concrete floor slabs should be underlain by a 10-mil polyethylene vapor retarder that works as a capillary break to reduce moisture migration into the slab section. All laps and seams should be overlapped 6-inches or as recommended by the manufacturer.

The vapor retarder should be protected from puncture. The joints and penetrations should be sealed with the manufacturer's recommended adhesive, pressure-sensitive tape, or both. The vapor retarder should extend a minimum of 12 inches into the footing excavations. The vapor retarder should be covered by 4 inches of clean sand (Sand Equivalent SE>30) unless placed on 2.5 feet of granular fill, in which case, the vapor retarder may lie directly on the granular fill with 2 inches of clean sand cover.

Placing sand over the vapor retarder may increase moisture transmission through the slab, because it provides a reservoir for bleed water from the concrete to collect. The sand placed over the vapor retarder may also move and mound prior to concrete placement, resulting in an irregular slab thickness. For areas with moisture sensitive flooring materials, ACI recommends that concrete slabs be placed without a sand cover directly over the vapor retarder, provided that the concrete mix uses a low-water cement ratio and concrete curing methods are employed to compensate for release of bleed water through the top of the slab. The vapor retarder should have a minimum thickness of 15-mil (Stego-Wrap or equivalent).

Structural concrete slab reinforcement should consist of chaired rebar slab reinforcement (minimum of No. 3 bars at 18-inch centers, both horizontal directions) placed at slab mid-height to resist potential swell forces and cracking. Slab thickness and steel reinforcement are minimums only and should be verified by the structural engineer/designer knowing the actual project loadings.

All steel components of the foundation system should be protected from corrosion by maintaining a 3-inch minimum concrete cover of densely consolidated concrete at footings (by use of a vibrator). The construction joint between the foundation and any mowstrips/sidewalks placed adjacent to foundations should be sealed with a polyurethane based non-hardening sealant to prevent moisture migration between the joint. Epoxy coated embedded steel components (ASTM D3963/A934) or permanent waterproofing membranes placed at the exterior footing sidewall may also be used to mitigate the corrosion potential of concrete placed in contact with native soil.

Control joints should be provided in all concrete slabs-on-grade at a maximum spacing (in feet) of 2 to 3 times the slab thickness (in inches) as recommended by American Concrete Institute (ACI) guidelines. All joints should form approximately square patterns to reduce randomly oriented contraction cracks.

Contraction joints in the slabs should be tooled at the time of the pour or sawcut (¼ of slab depth) within 6 to 8 hours of concrete placement. Construction (cold) joints in foundations and area flatwork should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All joints in flatwork should be sealed to prevent moisture, vermin, or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region (refer to ACI guidelines).

Non-structural Concrete: All non-structural independent flatwork (sidewalks and housekeeping slabs) shall be a minimum of 4 inches thick and should be placed on a minimum of 4 inches of compacted (90%) concrete sand or aggregate base, dowelled to the perimeter foundations where adjacent to the building to prevent separation and sloped 2% (sidewalks) or 1 to 2% (housekeeping slabs) away from the building. Patio slabs with shade structures shall have a perimeter footing (18-inch embedment depth) and shall have interior grade beams (12-inch minimum embedment depth) at 15 feet on center. Planters that trap water between sidewalks and foundations are not allowed.

A minimum of 24 inches of moisture conditioned (5% minimum above optimum) and 8 inches of compacted subgrade (85 to 90%) should underlie all independent flatwork. Flatwork which contains steel reinforcing (except wire mesh) should be underlain by a 10-mil (minimum) polyethylene separation sheet and at least a 2-inch sand cover. All flatwork should be jointed in square patterns and at irregularities in shape at a maximum spacing of 8 feet or the least width of the sidewalk.

4.4 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on bulk samples of the near surface soil from the project site (Plate C-4). The native soils were found to have S0 to S1 (low to moderate) levels of sulfate ion concentration (804 to 1,500ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling. The following table provides American Concrete Institute (ACI) recommended cement types, water-cement ratio and minimum compressive strengths for concrete in contact with soils:

Concrete Mix Design Criteria due to Soluble Sulfate Exposure

Sulfate Exposure Class	Water-soluble Sulfate (SO_4) in soil, ppm	Cement Type	Maximum Water-Cement Ratio by weight	Minimum Strength f'c (psi)
S0	0-1,000	–	–	–
S1	1,000-2,000	II	0.50	4,000
S2	2,000-20,000	V	0.45	4,500
S3	Over 20,000	V (plus Pozzolon)	0.45	4,500

Note: From ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

However, in consideration of general corrosive environment in the vicinity, it is recommended a minimum of 6.0 sacks per cubic yard of concrete (4,500 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.45 (by weight) should be used for concrete placed in contact with native soil on this project (sitework including sidewalks, driveways, patios, and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete. Thorough concrete consolidation and hard trowel finishes should be used due to the aggressive soil exposure.

The native soil has severe levels of chloride ion concentration (1,180 to 1,240ppm). Chloride ions can cause corrosion of reinforcing steel, anchor bolts and other buried metallic conduits. Resistivity determinations on the soil indicate very severe potential for metal loss because of electrochemical corrosion processes. Mitigation of the corrosion of steel can be achieved by using steel pipes coated with epoxy corrosion inhibitors, asphaltic and epoxy coatings, cathodic protection or by encapsulating the portion of the pipe lying above groundwater with a minimum of 3 inches of densely consolidated concrete. ***No metallic water pipes or conduits should be placed below foundations.***

Foundation designs shall provide a minimum concrete cover of three (3) inches around steel reinforcing or embedded components (anchor bolts, etc.) exposed to native soil or landscape water (to 18 inches above grade). If the 3-inch concrete edge distance cannot be achieved, all embedded steel components (anchor bolts, etc.) shall be epoxy coated for corrosion protection (in accordance with ASTM D3963/A934) or a corrosion inhibitor and a permanent waterproofing membrane shall be placed along the exterior face of the exterior footings. ***Hold-down straps should not be used at foundation edges due to corrosion of metal at its protrusion from the slab edge.*** Additionally, the concrete should be thoroughly vibrated at footings during placement to decrease the permeability of the concrete. ***Copper water piping (except for trap primers) should not be placed under floor slabs.***

Landmark does not practice corrosion engineering. We recommend that a qualified corrosion engineer evaluate the corrosion potential on metal construction materials and concrete at the site to obtain final design recommendations.

4.5 Excavations

All site excavations should conform to CalOSHA requirements for Type B soil (if site is dewatered or Type C soils for non-dewatered excavations). The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be cut nearly vertical for short duration. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type B soil. These temporary deep excavations will require slope inclinations no steeper than 1½(H):1(V) unless trench shoring is used.

If excavations are planned below groundwater (10 feet below ground surface), all excavation slopes should be excavated according to OSHA Standards for Type C soils. Seepage and pumping subgrade conditions should be anticipated. An adequately designed dewatering system (well points) will be required to control groundwater seepage and prevent running ground conditions. Dewatering of the excavation site will be required prior to start of excavation (2 ft. below bottom of excavation).

All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

All discussions in this section regarding stable excavation slopes assumes minimal equipment vibration and adequate setback of excavated material and construction equipment from the top of the excavation. We recommended that the minimum setback distance be equal to the depth of excavation and at least 10 feet from the crown of the slope. If excavated materials are stockpiled adjacent to the excavation, the weight of the material should be considered as a surcharge load for slope stability.

The responsibility for dewatering and the selection and performance of an appropriate system is the contractor's responsibility. The contractor is cautioned to evaluate soil moisture and groundwater conditions at the time of bidding. This report should be made available to dewatering contractors for theirs initial assessment of the site conditions. However, it is the contractor's own risk to interpret the information contained in this report.

4.6 Utility Trench Backfill

Utility Trench Backfill: Prior to placement of utility bedding, the exposed subgrade at the bottom of trench excavations should be examined for soft, loose, or unstable soil. Loose materials at trench bottoms resulting from excavation disturbance should be removed to firm material. If extensive soft or unstable areas are encountered, these areas should be over-excavated to a depth of at least 2 feet or to a firm base and be replaced with additional bedding material.

Backfill Materials: Pipe zone backfill (i.e., material beneath and in the immediate vicinity of the pipe) should consist of a 4 to 8 inch bed of ⅜-inch crushed rock, sand/cement slurry (3 sack cement factor), and/or crusher fines (sand) extending to a minimum of 12 inches above the top of pipe. If crushed rock is used for pipe zone backfill for utilities, the crushed rock material should be completed surrounded by a non-woven filter fabric such as Mirafi 140N or equivalent. The filter fabric shall cover the trench bottom, sidewalls and over the top of the crushed rock. The filter fabric is recommended to inhibit the migration of fine material into void spaces in the crushed rock which may create the potential for sinkholes or depressions to develop at the ground surface.

Pipe bedding should be in accordance with pipe manufacturer's recommendations. Recommendations provided above for pipe zone backfill are minimum requirements only. More stringent material specifications may be required to fulfill local codes and/or bedding requirements for specific types of pipes. On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill above pipezone, but may be difficult to uniformly maintain at specified moistures and compact to the specified densities. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

Compaction Criteria: Mechanical compaction is recommended; ponding or jetting should not be allowed, especially in areas supporting structural loads or beneath concrete slabs supported-on-grade, pavements, or other improvements. All trench backfill should be placed and compacted in accordance with recommendations provided above for engineered fill.

The pipe zone material (crusher fines, sand) shall be compacted to a minimum of 95% of ASTM D1557 maximum density. Pipe deflection should be checked to not exceed 2% of pipe diameter. Native clay/silt soils may be used to backfill the remainder of the trench. Soils used for trench backfill shall be placed in maximum 6 inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at a minimum of 4% above optimum moisture.

Imported granular material is acceptable for backfill of utility trenches. Granular trench backfill used in building pad areas should be plugged with a solid (no clods or voids) 2-foot width of native clay soils at each end of the building foundation to prevent landscape water migration into the trench below the building.

Backfill soil of utility trenches within paved areas should be uniformly moisture conditioned to a minimum of 4% above optimum moisture, placed in layers not more than 6 inches in thickness and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density, except that the top 12 inches shall be compacted to 95% (if granular trench backfill).

4.7 Lateral Earth Pressures

Earth retaining structures, such as retaining walls, should be designed to resist the soil pressure imposed by the retained soil mass. Walls without granular drained backfill may be designed for an assumed static earth pressure equivalent to that exerted by a fluid weighing 60 (45 sand) pcf for unrestrained (active) conditions (able to rotate 0.1% of wall height), and 100 (60 sand) pcf for restrained (at-rest) conditions. These values should be verified at the actual wall locations during construction.

When applicable (Seismic Design Category D, E or F), retaining wall structures where the backfill is greater than 6 feet high shall be designed in addition to the static loading (active or at-rest condition) with an additional seismic lateral pressure increasing linearly with depth and the resultant acting as a point load at 0.4H above the base of the wall. The term H is the height of the backfill against a retaining wall in feet. The seismic load increment, shall be determined using the following equations for different wall type and backfill conditions:

Basement (restrained) walls with level backfill: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.68\ PGA_M/g)$

Cantilever (unrestrained) wall with level backfill: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.42\ PGA_M/g)$

Cantilever (unrestrained) wall with sloping backfill*: $\Delta K_{ae} = \frac{1}{2}\gamma H^2(0.70\ PGA_M/g)$

*Applicable for sloping backfill that is no steeper than 2:1 (horizontal:vertical).

Where:
ΔK_{ae} = Seismic Lateral Force (plf) based on seismic pressure
γ = 125 pcf
A PGA_M value of 0.65g has been determined for the project site.
H = Height of retained soil (ft)

Surcharge loads should be considered if loads are applied within a zone between the face of the wall and a plane projected behind the wall 45 degrees upward from the base of the wall. The increase in lateral earth pressure acting uniformly against the back of the wall should be taken as 50% of the surcharge load within this zone. Areas of the retaining wall subjected to traffic loads should be designed for a uniform surcharge load equivalent to two feet of native soil.

Walls should be provided with backdrains to reduce the potential for the buildup of hydrostatic pressure. The drainage system should consist of a composite HDPE drainage panel or a 2-foot wide zone of free draining crushed rock placed adjacent to the wall and extending 2/3 the height of the wall. The gravel should be completely enclosed in an approved filter fabric to separate the gravel and backfill soil. A perforated pipe should be placed perforations down at the base of the permeable material at least six inches below finished floor elevations. The pipe should be sloped to drain to an appropriate outlet that is protected against erosion. Walls should be properly waterproofed. The project geotechnical engineer should approve any alternative drain system.

4.8 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the Imperial, Laguna Salada, and Superstition Hills faults. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Site Class D using the seismic coefficients given in Section 3.6 and Table 2 of this report.

Section 5
LIMITATIONS AND ADDITIONAL SERVICES

5.1 Limitations

The findings and professional opinions within this report are based on current information regarding the proposed improvements to the Seeley County Water District's Wastewater Treatment Plant facility located at northwest corner of West Main Street and New River Boulevard in Seeley, California. The conclusions and professional opinions of this report are invalid if:

- Structural loads change from those stated or the structures are relocated.
- The Additional Services section of this report is not followed.
- This report is used for adjacent or other property.
- Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- Any other change that materially alters the project from that proposed at the time this report was prepared.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Imperial County at the time the report was prepared. No express or implied warranties are made in connection with our services.

Findings and professional opinions in this report are based on selected points of field exploration, geologic literature, limited laboratory testing, and our understanding of the proposed project. Our analysis of data and professional opinions presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. The nature and extend of such variations may not become evident until, during or after construction. If variations are detected, we should immediately be notified as these conditions may require additional studies, consultation, and possible design revisions.

Environmental or hazardous materials evaluations were not performed by Landmark for this project. Landmark will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

The client has responsibility to see that all parties to the project including designer, contractor, and subcontractor are made aware of this entire report within a reasonable time from its issuance. This report should be considered invalid for periods after two years from the date of report issuance without a review of the validity of the findings and professional opinions by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice. This report is based upon government regulations in effect at the time of preparation of this report. Future changes or modifications to these regulations may require modification of this report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify Landmark of such intended use. Based on the intended use of the report, Landmark may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Landmark from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold Landmark harmless from any claim or liability associated with such unauthorized use or non-compliance.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded is such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 Plan Review

Landmark Consultants, Inc. should be retained during development of design and construction documents to check that the geotechnical professional opinions are appropriate for the proposed project and that the geotechnical professional opinions are properly interpreted and incorporated into the documents. Landmark should have the opportunity to review the final design plans and specifications for the project prior to the issuance of such for bidding.

Governmental agencies may require review of the plans by the geotechnical engineer of record for compliance to the geotechnical report.

5.3 Additional Services

We recommend that Landmark Consultant be retained to provide the tests and observations services during construction. *The geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

Landmark Consultants, Inc. professional opinions for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the findings and professional opinions in this report are made contingent upon the opportunity for Landmark Consultants to observe grading operations and foundation excavations for the proposed construction.

If parties other than Landmark Consultants, Inc. are engaged to provide observation and testing services during construction, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the professional opinions in this report and/or by providing alternative professional guidance.

Additional information concerning the scope and cost of these services can be obtained from our office.

Section 6
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TABLES

Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Unnamed 1*	4.9	7.9			
Superstition Hills	5.4	8.6	6.6	23 ± 2	4 ± 2
Superstition Mountain	6.4	10.2	6.6	24 ± 2	5 ± 3
Yuha*	6.9	11.1			
Unnamed 2*	7.8	12.5			
Shell Beds	8.1	13.0			
Yuha Well *	8.3	13.2			
Imperial	11.2	17.9	7	62 ± 6	20 ± 5
Laguna Salada	11.4	18.2	7	67 ± 7	3.5 ± 1.5
Vista de Anza*	11.6	18.5			
Painted Gorge Wash*	13.3	21.2			
Brawley *	13.4	21.4			
Ocotillo*	15.8	25.2			
Borrego (Mexico)*	16.6	26.5			
Rico *	17.4	27.8			
Elmore Ranch	18.5	29.6	6.6	29 ± 3	1 ± 0.5
Elsinore - Coyote Mountain	19.2	30.7	6.8	39 ± 4	4 ± 2
San Jacinto - Borrego	22.9	36.6	6.6	29 ± 3	4 ± 2
Pescadores (Mexico)*	24.0	38.4			
Cerro Prieto *	24.6	39.3			
Cucapah (Mexico)*	26.1	41.8			
San Andreas - Coachella	38.5	61.6	7.2	96 ± 10	25 ± 5

* Note: Faults not included in CGS database.

Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters

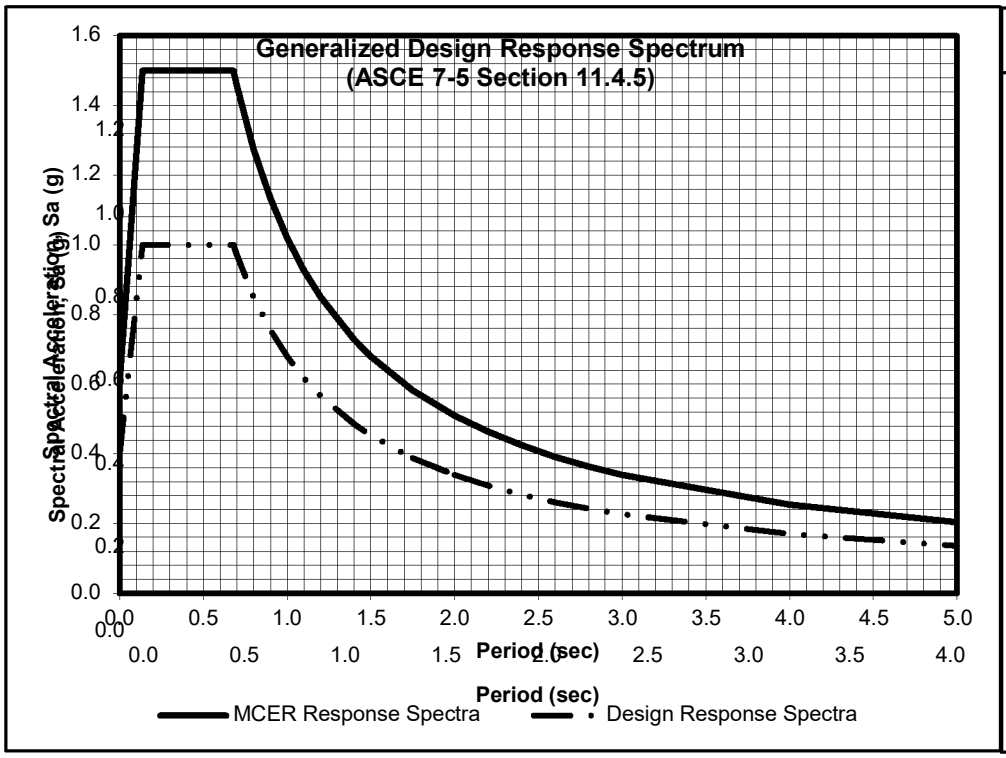
			ASCE 7-16 Reference
Soil Site Class:	**D**		Table 20.3-1
Latitude:	32.7934	N	
Longitude:	-115.7001	W	
Risk Category:	III		
Seismic Design Category:	D		

Maximum Considered Earthquake (MCE) Ground Motion

Mapped MCE_R Short Period Spectral Response	S_s	1.500 g	ASCE Figure 22-1	
Mapped MCE_R 1 second Spectral Response	S_1	0.600 g	ASCE Figure 22-2	
Short Period (0.2 s) Site Coefficient	F_a	1.00	ASCE Table 11.4-1	
Long Period (1.0 s) Site Coefficient	F_v	1.70	ASCE Table 11.4-2	
MCE_R Spectral Response Acceleration Parameter (0.2 s)	S_{MS}	1.500 g	= Fa * S_s	ASCE Equation 11.4-1
MCE_R Spectral Response Acceleration Parameter (1.0 s)	S_{M1}	1.020 g	= Fv * S_1	ASCE Equation 11.4-2

Design Earthquake Ground Motion

Design Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	1.000 g	= 2/3*S_{MS}	ASCE Equation 11.4-3
Design Spectral Response Acceleration Parameter (1.0 s)	S_{D1}	0.680 g	= 2/3*S_{M1}	ASCE Equation 11.4-4
Risk Coefficient at Short Periods (less than 0.2 s)	C_{RS}	0.968		ASCE Figure 22-17
Risk Coefficient at Long Periods (greater than 1.0 s)	C_{R1}	0.937		ASCE Figure 22-18
	T_L	8.00 sec		ASCE Figure 22-12
	T_O	0.14 sec	=0.2*S_{D1}/S_{DS}	
	T_S	0.68 sec	=S_{D1}/S_{DS}	
Peak Ground Acceleration	PGA_M	0.65 g		ASCE Equation 11.8-1



Period T (sec)	Sa (g)	MCE_R Sa (g)
0.00	0.40	0.60
0.14	1.00	1.50
0.68	1.00	1.50
0.70	0.97	1.46
0.80	0.85	1.28
0.90	0.76	1.13
1.00	0.68	1.02
1.10	0.62	0.93
1.20	0.57	0.85
1.20	0.57	0.85
1.40	0.49	0.73
1.50	0.45	0.68
1.75	0.39	0.58
2.00	0.34	0.51
2.20	0.31	0.46
2.40	0.28	0.43
2.60	0.26	0.39
2.80	0.24	0.36
3.00	0.23	0.34
4.00	0.17	0.26
5.00	0.14	0.20

FIGURES



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK
Geo-Engineers and Geologists

Project No.: LE21017

Regional Fault Map

Figure 1



Source: California Geological Survey 2010 Fault Activity Map of California
http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#

LANDMARK Geo-Engineers and Geologists Project No.: LE21017	Map of Local Faults	Figure 2

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lekes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

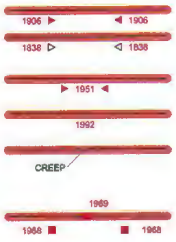
FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompenying earthquakes.

(c) displaced survey lines.



A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic				Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
			4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

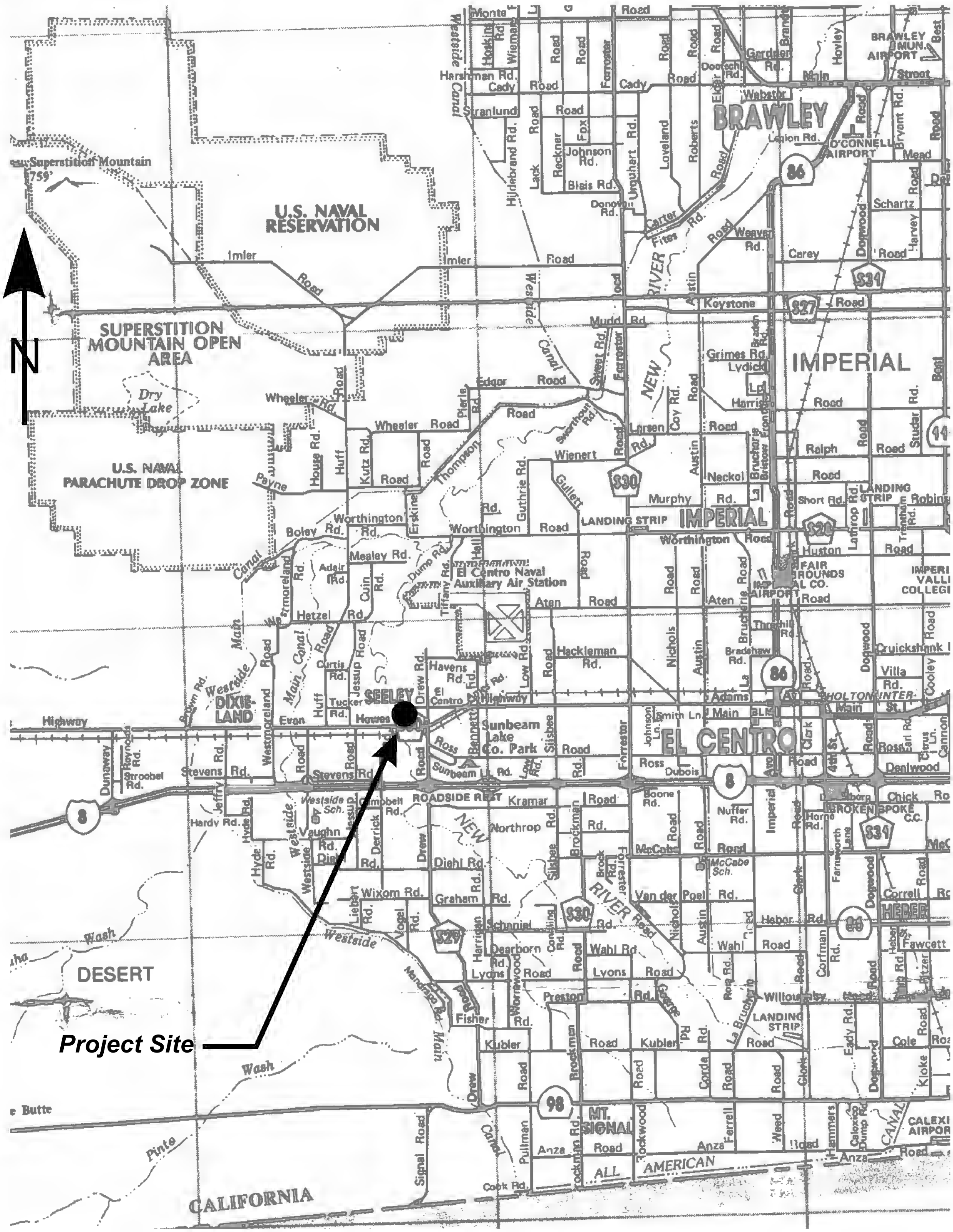
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Project No.: LE21017

Fault Map Legend

Figure 3

APPENDIX A



LandMark Geo-Engineers and Geologists Project No.: LE21017	Vicinity Map	Plate A-1

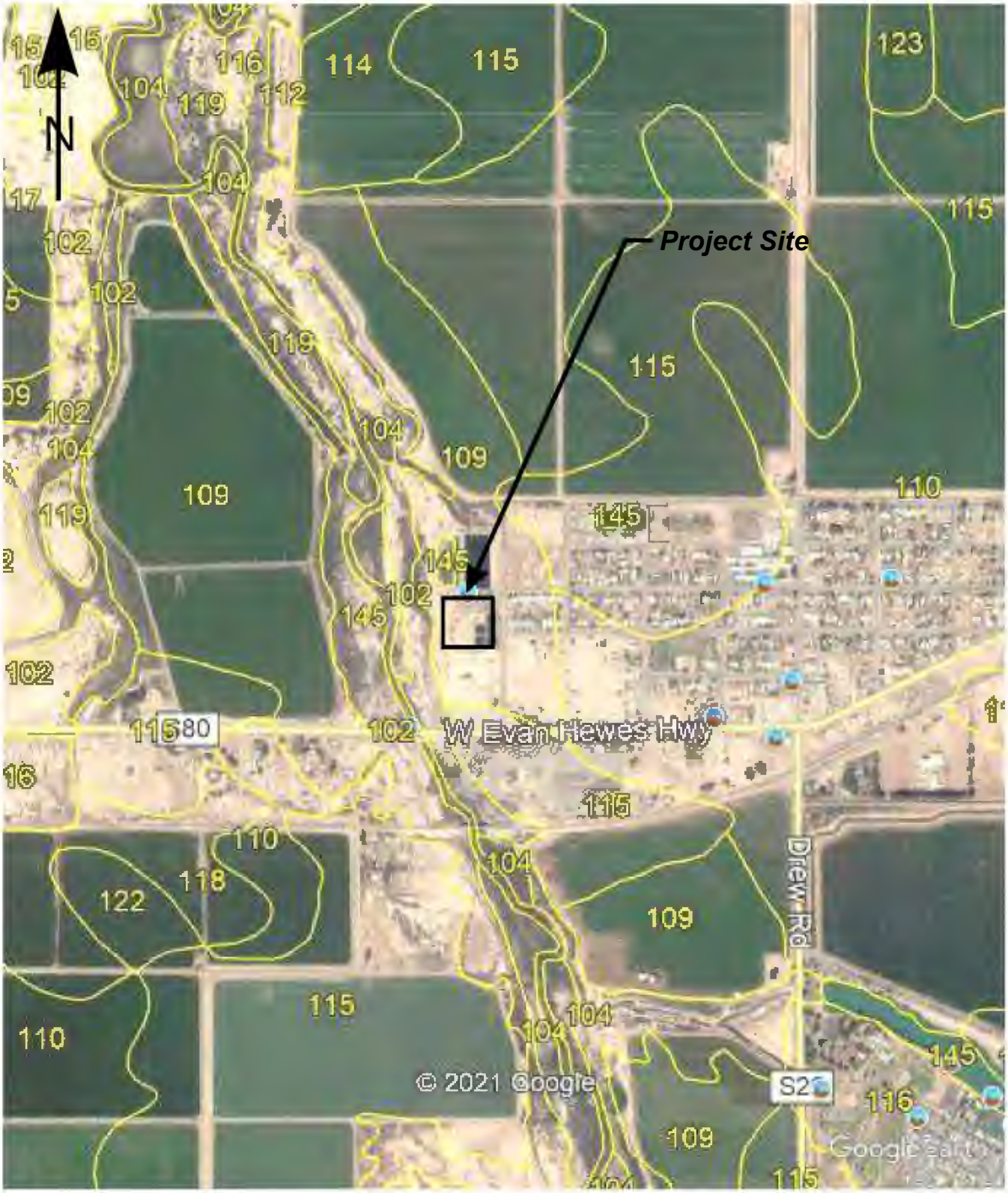


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Site and Exploration Map

Plate
A-2



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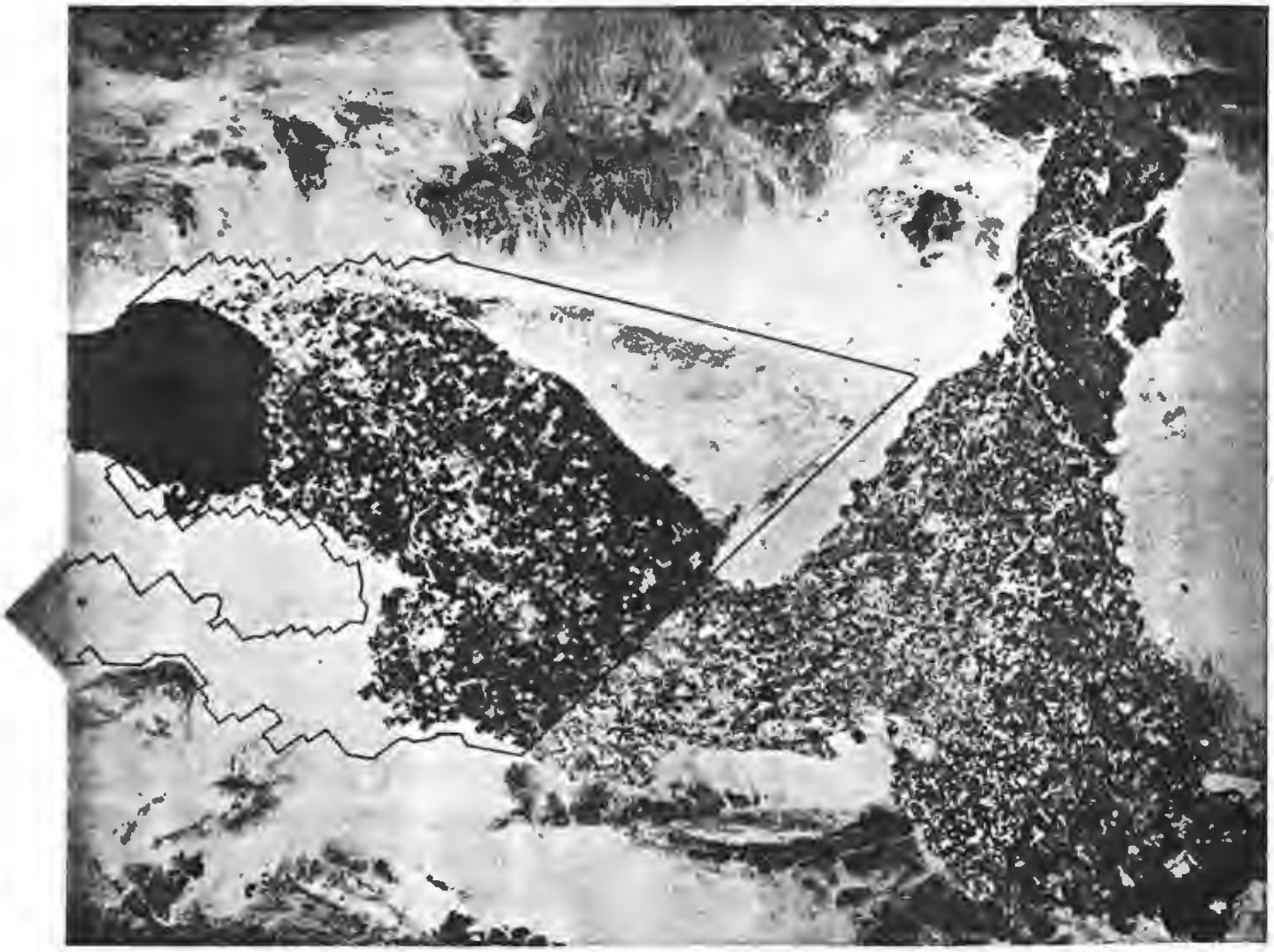
Project No.: LE21017

Soil Survey Map

Plate A-3

Soil Survey of

IMPERIAL COUNTY CALIFORNIA IMPERIAL VALLEY AREA



United States Department of Agriculture Soil Conservation Service
in cooperation with
University of California Agricultural Experiment Station
and
Imperial Irrigation District

TABLE 11.--ENGINEERING INDEX PROPERTIES

[The symbol > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
100---------- Antho	0-13	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	13-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
101*:											
Antho----------	0-8	Loamy fine sand	SM	A-2	0	100	100	75-85	10-30	---	NP
	8-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	90-100	75-95	50-60	15-40	---	NP
Superstition------	0-6	Fine sand-------	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
102*. Badland											
103---------- Carsitas	0-10	Gravelly sand---	SP, SP-SM	A-1, A-2	0-5	60-90	50-85	30-55	0-10	---	NP
	10-60	Gravelly sand, gravelly coarse sand, sand.	SP, SP-SM	A-1	0-5	60-90	50-85	25-50	0-10	---	NP
104* Fluvaquents											
105---------- Glenbar	0-13	Clay loam-------	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
106---------- Glenbar	0-13	Clay loam-------	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
107*---------- Glenbar	0-13	Loam----------	ML, CL-ML, CL	A-4	0	100	100	100	70-80	20-30	NP-10
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	75-95	35-45	15-30
108---------- Holtville	0-14	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	14-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
109---------- Holtville	0-17	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
110---------- Holtville	0-17	Silty clay------	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	17-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-35	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	35-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
111*:											
Holtville	0-10	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	10-22	Clay, silty clay	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
	22-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	65-85	25-35	NP-10
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
112	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
113	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay, clay, silty clay loam.	CH	A-7	0	100	100	100	85-95	50-70	25-45
114	0-12	Silty clay	CH	A-7	0	100	100	100	85-95	50-70	25-45
Imperial	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
115*:											
Imperial	0-12	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
116*:											
Imperial	0-13	Silty clay loam	CL	A-7	0	100	100	100	85-95	40-50	10-20
	13-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
Glenbar	0-13	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	35-45	15-25
	13-60	Clay loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-95	35-45	15-30
117, 118	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Indio	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
119*:											
Indio	0-12	Loam	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-72	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
Vint	0-10	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	25-35	---	NP
	10-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
120*	0-12	Loam	ML, CL-ML	A-4	0	100	95-100	75-85	55-65	20-30	NP-10
Laveen	12-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	95-100	85-95	70-80	55-65	15-25	NP-10

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

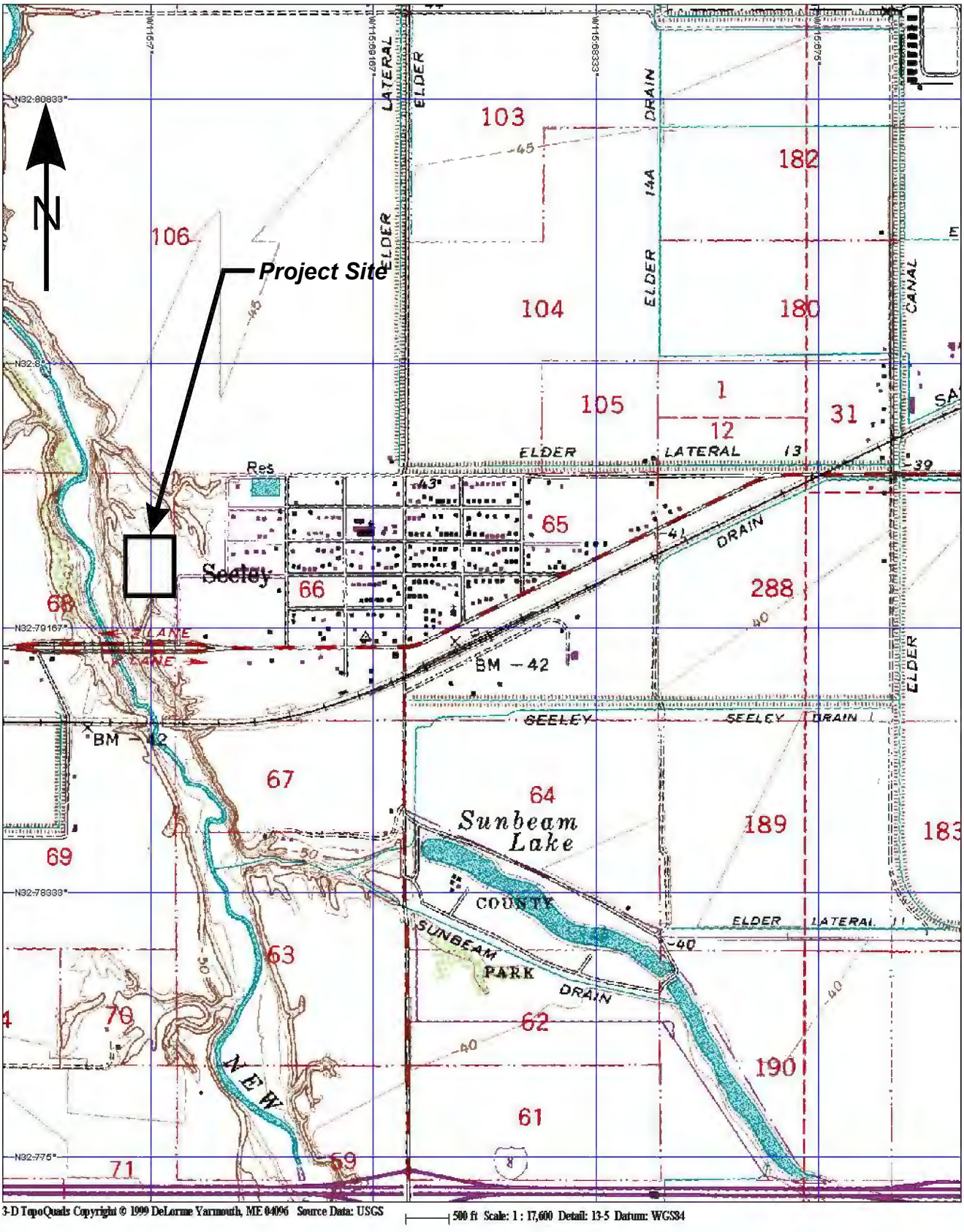
Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
121---------- Meloland	0-12	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	75-100	5-30	---	NP
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-65	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-40
122---------- Meloland	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-71	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
123*:											
Meloland----------	0-12	Loam----------	ML	A-4	0	95-100	95-100	95-100	55-85	25-35	NP-10
	12-26	Stratified loamy fine sand to silt loam.	ML	A-4	0	100	100	90-100	50-70	25-35	NP-10
	26-38	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-40
	38-60	Stratified silt loam to loamy fine sand.	SM, ML	A-4	0	100	100	75-100	35-55	25-35	NP-10
Holtville---------	0-12	Loam----------	ML	A-4	0	100	100	85-100	55-95	25-35	NP-10
	12-24	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	85-95	40-65	20-35
	24-36	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-85	25-35	NP-10
	36-60	Loamy very fine sand, loamy fine sand.	SM, ML	A-2, A-4	0	100	100	75-100	20-55	---	NP
124, 125---------- Niland	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
126---------- Niland	0-23	Fine sand-------	SM, SP-SM	A-2, A-3	0	90-100	90-100	50-65	5-25	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
127---------- Niland	0-23	Loamy fine sand	SM	A-2	0	90-100	90-100	50-65	15-30	---	NP
	23-60	Silty clay------	CL, CH	A-7	0	100	100	85-100	80-95	40-65	20-40
128*:											
Niland----------	0-23	Gravelly sand---	SM, SP-SM	A-2, A-3	0	90-100	70-95	50-65	5-25	---	NP
	23-60	Silty clay, clay, clay loam.	CL, CH	A-7	0	100	100	85-100	80-100	40-65	20-40
Imperial----------	0-12	Silty clay------	CH	A-7	0	100	100	100	85-95	50-70	25-45
	12-60	Silty clay loam, silty clay, clay.	CH	A-7	0	100	100	100	85-95	50-70	25-45
129*: Pits											
130, 131---------- Rositas	0-27	Sand----------	SP-SM	A-3, A-1, A-2	0	100	80-100	40-70	5-15	---	NP
	27-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP

See footnote at end of table.

TABLE 11.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133, 134, 135-Rositas	0-9	Fine sand-------	SM	A-3, A-2	0	100	80-100	50-80	10-25	---	NP
	9-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
136----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
Rositas	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
137----------	0-12	Silt loam-------	ML	A-4	0	100	100	90-100	70-90	20-30	NP-5
Rositas	12-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
138*:											
Rositas----------	0-4	Loamy fine sand	SM	A-1, A-2	0	100	80-100	40-85	10-35	---	NP
	4-60	Sand, fine sand, loamy sand.	SM, SP-SM	A-3, A-2, A-1	0	100	80-100	40-85	5-30	---	NP
Superstition------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
139----------	0-6	Loamy fine sand	SM	A-2	0	100	95-100	70-85	15-25	---	NP
Superstition	6-60	Loamy fine sand, fine sand, sand.	SM	A-2	0	100	95-100	70-85	15-25	---	NP
140*:											
Torriorthents											
Rock outcrop											
141*:											
Torriorthents											
Orthids											
142----------	0-10	Loamy very fine sand.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
Vint	10-60	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
143----------	0-12	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-85	45-55	15-25	NP-5
Vint	12-60	Loamy sand, loamy fine sand.	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
144*:											
Vint----------	0-10	Very fine sandy loam.	SM, ML	A-4	0	100	100	85-95	40-65	15-25	NP-5
	10-40	Loamy fine sand	SM	A-2	0	95-100	95-100	70-80	20-30	---	NP
	40-60	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35
Indio----------	0-12	Very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	12-40	Stratified loamy very fine sand to silt loam.	ML	A-4	0	95-100	95-100	85-100	75-90	20-30	NP-5
	40-72	Silty clay------	CL, CH	A-7	0	100	100	95-100	85-95	40-65	20-35

* See description of the map unit for composition and behavior characteristics of the map unit.



LANDMARK
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Project No.: LE21017

Topographic Map

Plate A-4

APPENDIX B

LOG OF BORING No. B-1

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SILTY CLAY/CLAYEY SILT (CL-ML): Brown, dry to moist, stiff, low to medium plasticity			LL=27% PI=6%
5			12		SILTY SAND (SM): Light brown, very moist, medium dense to dense, very fine grained sand.		5.3	Passing #200 = 30.7%
10			45			97.6	7.6	c=0.27 tsf Φ=26° % passing #200 = 14.9%
15			8	2.5	SILTY CLAY/CLAY (CL-CH): Reddish brown, very moist, stiff, medium to high plasticity			
20			17	1.0		95.3	28.9	c=0.66 tsf
25			9	1.5			31.2	LL=52% PI=32%
30			12	2.0		91.0	32.6	c=0.69 tsf
35			12	2.5				
40			12	2.0				
45			9	2.5				
50			10	1.5	Some very fine grained sand			
55					Groundwater measured at 40.5 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
60								

DATE DRILLED: 2/16/21 | TOTAL DEPTH: 51.5 Feet | DEPTH TO WATER: 40.5 ft.

LOGGED BY: J. Avalos | TYPE OF BIT: Hollow Stem Auger | DIAMETER: 8 in.

SURFACE ELEVATION: Approximately -45' | HAMMER WT.: 140 lbs. | DROP: 30 in.

PROJECT No. LE21017

LANDMARK Geo-Engineers and Geologists

PLATE B-1

LOG OF BORING No. B-2

SHEET 1 OF 1

DEPTH	FIELD: SAMPLE	FIELD: USCS CLASS.	FIELD: BLOW COUNT	FIELD: POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	LABORATORY: DRY DENSITY (pcf)	LABORATORY: MOISTURE CONTENT (% dry wt.)	LABORATORY: OTHER TESTS
					SILTY CLAY/CLAYEY SILT (CL-ML): Brown, dry to moist, stiff, low to medium plasticity			LL=24% PI=4%
5			32		SANDY SILT/SILTY SAND (SM-ML): Light brown, moist, medium dense, very fine grained sand.		4.5	Passing #200 = 31.3%
10			11		Saturated		29.3	% passing #200 = 52.3%
15			15	1.5	SILTY CLAY/CLAY (CL-CH): Reddish brown, very moist, medium stiff to stiff, medium to high plasticity	91.8	31.2	c=0.63 tsf
20			8	2.0			29.8	LL=38% PI=22%
25			21	2.5				
30			6	2.5				
35			22	1.5				
40			10	2.0	Some very fine grained sand ▼			
45			9	2.5				
50			10	2.5				
55					Groundwater measured at 41.7 feet at time of drilling. This is not considered the stabilized groundwater depth as groundwater may rise to a level higher than that measured in borehole.			
60								

DATE DRILLED: 2/16/21 | TOTAL DEPTH: 51.5 Feet | DEPTH TO WATER: 41.7 ft.

LOGGED BY: J. Avalos | TYPE OF BIT: Hollow Stem Auger | DIAMETER: 8 in.

SURFACE ELEVATION: Approximately -45' | HAMMER WT.: 140 lbs. | DROP: 30 in.

PROJECT No. LE21017

LANDMARK Geo-Engineers and Geologists

PLATE B-2

DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS	
Coarse grained soils More than half of material is larger that No. 200 sieve	**Gravels**	Clean gravels (less than 5% fines)		**GW**	Well graded gravels, gravel-sand mixtures, little or no fines
	More than half of coarse fraction is larger than No. 4 sieve			**GP**	Poorly graded gravels, or gravel-sand mixtures, little or no fines
		Gravel with fines		**GM**	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
				**GC**	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	Sands	Clean sands (less than 5% fines)		**SW**	Well graded sands, gravelly sands, little or no fines
	More than half of coarse fraction is smaller than No. 4 sieve			**SP**	Poorly graded sands or gravelly sands, little or no fines
		Sands with fines		**SM**	Silty sands, sand-silt mixtures, non-plastic fines
				**SC**	Clayey sands, sand-clay mixtures, plastic fines
Fine grained soils More than half of material is smaller than No. 200 sieve	**Silts and clays**			**ML**	Inorganic silts, clayey silts with slight plasticity
	Liquid limit is less than 50%			**CL**	Inorganic clays of low to medium plasticity, gravely, sandy, or lean clays
				**OL**	Organic silts and organic clays of low plasticity
	Silts and clays			**MH**	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts
	Liquid limit is more than 50%			**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

GRAIN SIZES

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		
200	40	10	4	3/4"	3"	12"	

US Standard Series Sieve — Clear Square Openings

Sands, Gravels, etc.	Blows/ft. *
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Clays & Plastic Silts	Strength **	Blows/ft. *
Very Soft	0-0.25	0-2
Soft	0.25-0.5	2-4
Firm	0.5-1.0	4-8
Stiff	1.0-2.0	8-16
Very Stiff	2.0-4.0	16-32
Hard	Over 4.0	Over 32

* Number of blows of 140 lb. hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 in. I.D.) split spoon (ASTM D1586).

** Unconfined compressive strength in tons/s.f. as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D1586), Pocket Penetrometer, Torvane, or visual observation.

Type of Samples:

Ring Sample — Standard Penetration Test — Shelby Tube — Bulk (Bag) Sample

Drilling Notes:

1. Sampling and Blow Counts
   - Ring Sampler - Number of blows per foot of a 140 lb. hammer falling 30 inches.
   - Standard Penetration Test - Number of blows per foot.
   - Shelby Tube - Three (3) inch nominal diameter tube hydraulically pushed.
2. P. P. = Pocket Penetrometer (tons/s.f.).
3. NR = No recovery.
4. GWT ▼ = Ground Water Table observed @ specified time.

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Key to Logs

Plate B-3

APPENDIX C

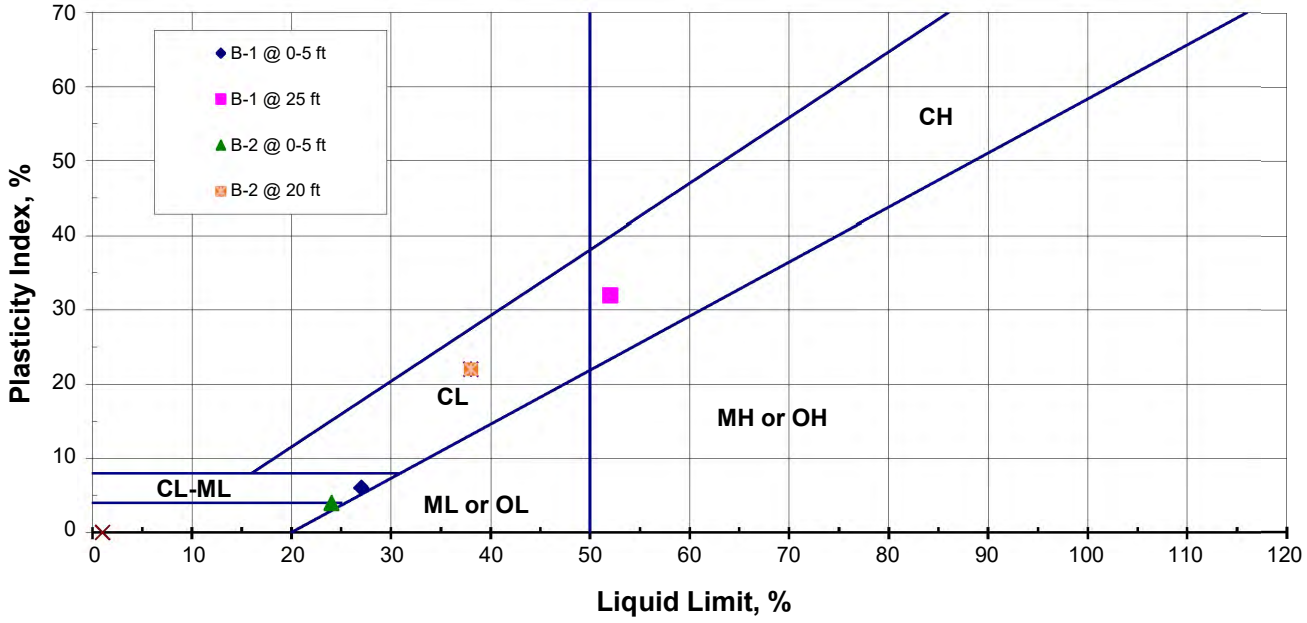
LANDMARK CONSULTANTS, INC.

CLIENT: Hazen & Sawyer
PROJECT: Seeley WWTP Improvements
JOB No.: LE21017
DATE: 02/23/21

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classification
B-1	0-5	27	21	6	CL
B-1	25	52	20	32	CH
B-2	0-5	24	20	4	CL
B-2	10	NL	NP	NLL-NPL	ML
B-2	20	38	16	22	CL

PLASTICITY CHART



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Project No.: LE21017

Atterberg Limits Test Results

Plate C-1

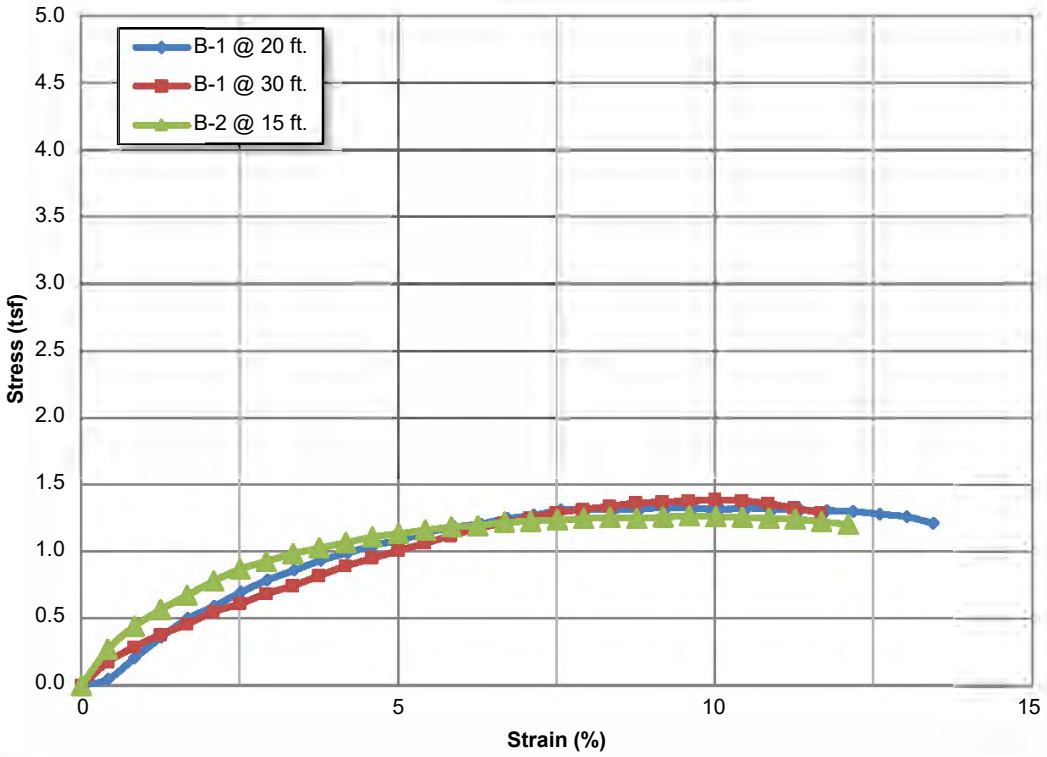
LANDMARK CONSULTANTS, INC.

CLIENT: Hazen and Sawyer
PROJECT: Seeley WWTP Improvements - Seeley, CA
JOB NO: LE21017
DATE: 2/22/2021

UNCONFINED COMPRESSION TEST (ASTM D2166)

Boring No.	Sample Depth (ft)	Natural Moisture Content (%)	Unit Dry Weight (pcf)	Maximum Compressive Strength (tsf)	Cohesion (tsf)	Failure Strain (%)
B-1	20	28.9	95.3	1.33	0.66	9.2
B-1	30	32.6	91.0	1.39	0.69	10.0
B-2	15	31.2	91.8	1.27	0.63	9.6

Stress - Strain Plot



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Project No.: LE21017

Unconfined Compression Test Results

Plate C-2

LANDMARK CONSULTANTS, INC.

CLIENT: Hazen and Sawyer
PROJECT: Seeley WWTP Improvements
PROJECT No: LE21017 **DATE:** 2/22/2021

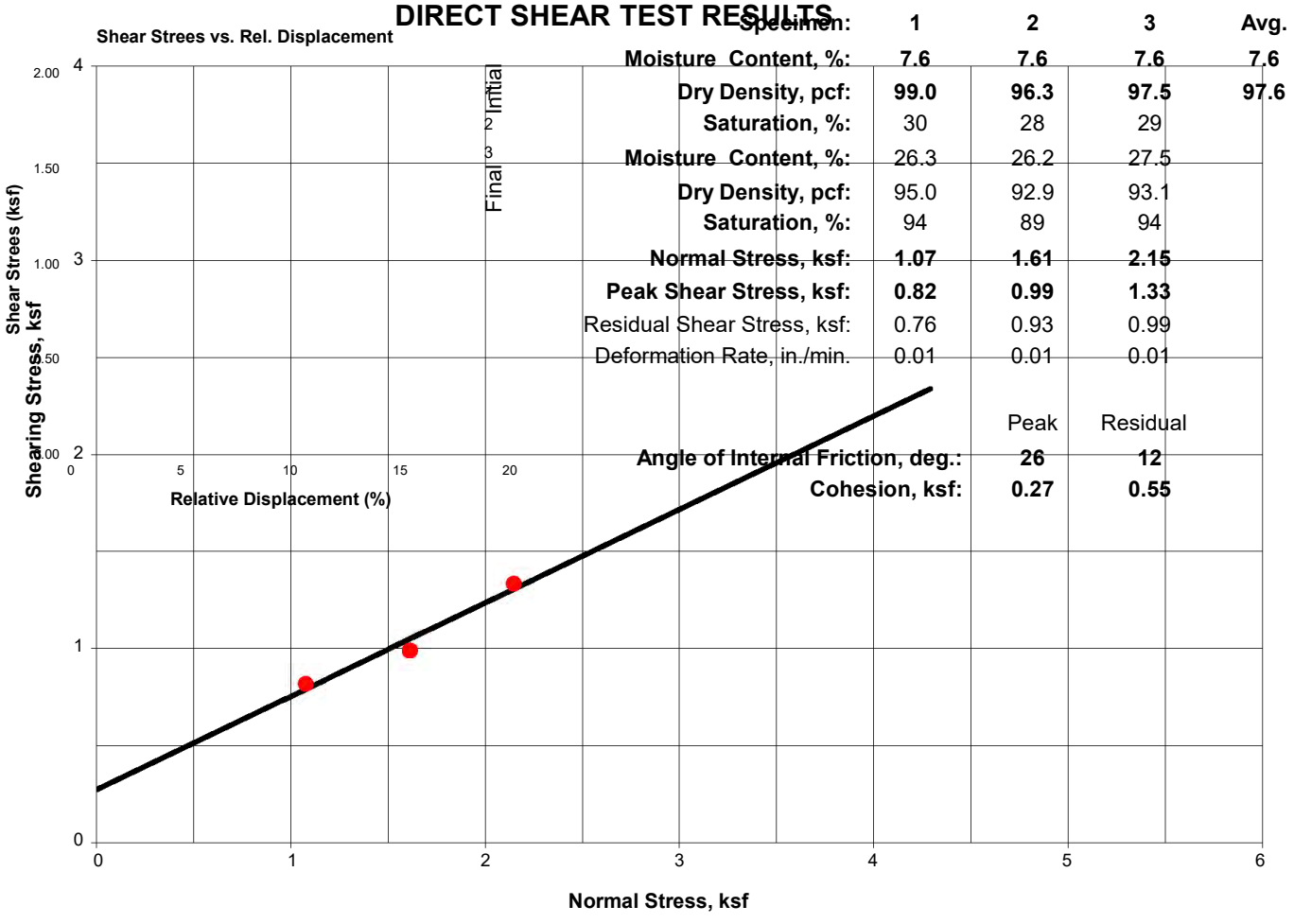
DIRECT SHEAR TEST - INSITU (ASTM D3080)

SAMPLE LOCATION: B-1 @ 10 ft
SAMPLE DESCRIPTION: Silty Sand (SM)

Angle of Internal Friction: 26º
Cohesion: 0.27 ksf
Initial Dry Density: 97.6 pcf
Initial Moisture Content: 7.6%

DIRECT SHEAR TEST RESULTS

Specimen:	1	2	3	Avg.
Moisture Content, %:	**7.6**	**7.6**	**7.6**	**7.6**
Dry Density, pcf:	**99.0**	**96.3**	**97.5**	**97.6**
Saturation, %:	30	28	29	
Moisture Content, %:	26.3	26.2	27.5	
Dry Density, pcf:	95.0	92.9	93.1	
Saturation, %:	94	89	94	
Normal Stress, ksf:	**1.07**	**1.61**	**2.15**	
Peak Shear Stress, ksf:	**0.82**	**0.99**	**1.33**	
Residual Shear Stress, ksf:	0.76	0.93	0.99	
Deformation Rate, in./min.	0.01	0.01	0.01	
		Peak	Residual	
Angle of Internal Friction, deg.:		**26**	**12**	
Cohesion, ksf:		**0.27**	**0.55**	



LANDMARK Geo-Engineers and Geologists	Direct Shear Test Results	Plate C-3
PROJECT No: LE21017		

LANDMARK CONSULTANTS, INC.

CLIENT: Hazen & Sawyer
PROJECT: Seeley WWTP Improvements
JOB No.: LE21017
DATE: 02/23/21

CHEMICAL ANALYSIS

	Boring:	B-1	B-2	Caltrans Method
	Sample Depth, ft:	0-5	0-5	
pH:		7.83	8.01	643
Electrical Conductivity (mmhos):		---	---	424
Resistivity (ohm-cm):		310	530	643
Chloride (Cl), ppm:		1,240	1,180	422
Sulfate (SO4), ppm:		804	1,500	417

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Range of Values	Degree of Corrosivity
Concrete	Soluble Sulfates (ppm)	0 - 1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides (ppm)	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity (ohm-cm)	1 - 1,000	Very Severe
		1,000 - 2,000	Severe
		2,000 - 10,000	Moderate
		> 10,000	Low

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Selected Chemical Test Results

Plate C-4

APPENDIX D

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Improvement - Seeley, CA
Project No.: LE21017
Location: B-1

Maximum Credible Earthquake	7.4		**Borehole Diameter**	8	in.
Design Ground Motion	0.65	g	**Rod Length**	3	ft.
Total Unit Weight,	110	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	85		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data						Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer
Depth		Blow Counts		Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence
(ft)	(m)	SPT	Mod. Cal.	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)
5	1.52	12		1	26.33	1	12	1.42	1.15	0.75	1.0	1.70	25	60	30.53	0.45		10.00	0.00
10	3.05		45	1	52.64	1	45	1.42	1.15	0.80	1.0	1.11	65	15	68.54	10.00	0.57	10.00	0.00
15	4.57	8		0	64.03	1	8	1.42	1.15	0.85	1.0	1.26	14	90	19.43	0.17	0.47	0.37	0.00
20	6.10		17	0	75.43	1	17	1.42	1.15	0.95	1.0	1.11	29	90	34.84	0.93	0.50	1.87	0.00
25	7.62	9		0	86.82	1	9	1.42	1.15	0.95	1.0	1.08	15	90	20.53	0.18	0.57	0.32	0.00
30	9.14		12	0	98.22	1	12	1.42	1.15	1.00	1.0	1.01	20	90	25.34	0.26	0.60	0.43	0.00
35	10.67	12		0	109.62	1	12	1.42	1.15	1.00	1.0	0.97	19	90	24.38	0.24	0.62	0.39	0.00
40	12.19		12	0	121.01	1	12	1.42	1.15	1.00	1.0	0.92	18	90	23.54	0.22	0.63	0.35	0.00
45	13.72	9		0	132.41	1	9	1.42	1.15	1.00	1.0	0.87	13	90	18.31	0.16	0.64	0.25	0.00
50	15.24	10		0	143.80	1	10	1.42	1.15	1.00	1.0	0.84	14	90	19.19	0.17	0.65	0.26	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils*, Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) **0.00**

Liquefaction Evaluation and Settlement Calculation

Project Name: Seeley WWTP Improvement - Seeley, CA
Project No.: LE21017
Location: B-2

Maximum Credible Earthquake	7.4		**Borehole Diameter**	8	in.
Design Ground Motion	0.65	g	**Rod Length**	3	ft.
Total Unit Weight,	110	pcf	**Rod Length**	0.91	m.
Water Unit Weight,	62.4	pcf	**Liners**	N	
Depth to Groundwater	10.0	ft	**K aging**	1	
Depth to Groundwater	3.05	m		3	
Hammer Effenciency	85		**Percentile of Liquefaction**	84	
Required Factor of Safety	1.3				

Boring Data						Sampling Corrections							Corrected	Fines	Compute Deterministic Vertical Strain				Individual Layer
Depth		Blow Counts		Liquefiable		Sampler	SPT	Energy	Borehole	Rod	Liner	Overburden	SPT	Content					Subsidence
(ft)	(m)	SPT	Mod. Cal.	Soil (0 / 1)	σ_v' (kPa)	Diameter	N_m	C_E	C_B	C_R	C_L	C_N	$(N_1)_{60}$	%	$(N1)_{60,Cs}^{site}$	$CRR(N^{site})$	CSR^{site}	FS_L^{site}	(inches)
5	1.52		32	1	26.33	1	32	1.42	1.15	0.75	1.0	1.35	53	60	58.56	10.00		10.00	0.00
10	3.05	11		1	52.64	1	11	1.42	1.15	0.80	1.0	1.34	19	30	24.58	0.24	0.37	0.66	0.99
15	4.57		15	0	64.03	1	15	1.42	1.15	0.85	1.0	1.20	25	90	30.48	0.45	0.44	1.01	0.00
20	6.10	8		0	75.43	1	8	1.42	1.15	0.95	1.0	1.16	14	90	19.84	0.18	0.53	0.33	0.00
25	7.62		21	0	86.82	1	21	1.42	1.15	0.95	1.0	1.05	34	90	39.74	3.29	0.54	6.04	0.00
30	9.14	6		0	98.22	1	6	1.42	1.15	1.00	1.0	1.02	10	90	15.46	0.14	0.60	0.23	0.00
35	10.67		22	0	109.62	1	22	1.42	1.15	1.00	1.0	0.97	35	90	40.44	4.13	0.62	6.72	0.00
40	12.19	10		0	121.01	1	10	1.42	1.15	1.00	1.0	0.92	15	90	20.46	0.18	0.63	0.29	0.00
45	13.72		9	0	132.41	1	9	1.42	1.15	1.00	1.0	0.87	13	90	18.31	0.16	0.64	0.25	0.00
50	15.24	10		0	143.80	1	10	1.42	1.15	1.00	1.0	0.84	14	90	19.19	0.17	0.65	0.26	0.00

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils*, Technical Report NCEER-97-0022, December 31, 1997.
Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) **0.99**